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Dear colleagues,

We are pleased to introduce vol. 10(1) issue of the international publications of Cairo University. It is a further step and distinct contribution, reflecting the scientific ability of staff members, which conforms to international quality standards.

The purpose of issuing these publications is mainly to introduce this work to the academic community, demonstrate the different research abilities of Cairo University researchers, and encourage them to increase the quality and quantity of their research.

We would like to assure you that the administration will spare no effort to support and reinforce these goals.

We congratulate all colleagues who were granted the awards for their international publications of the year 2015 and wish them all the best for their future endeavors.

We are also pleased to inform you that this policy will continue to be in effect for the years to come.

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Prof. Amr Adly   **Prof. Gaber Nassar**

Vice-President for Post-Graduate   **President**
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1. Validation of the Surface Downwelling Solar Irradiance Estimates of the Helioclim-3 Database in Egypt

Yehia Eissa, Mohamed Korany, Youva Aoun, Mohamed Boraiy, Magdy M. Abdel Wahab,Stephane C. Alfaro, Philippe Blanc, Mossad El-Metwally, Hosni Ghedira, Katja Hungershoefer and Lucien Wald

HelioClim-3 (HC3) is a database providing time series of the surface downwelling solar irradiance that are computed from images of the Meteosat satellites. This paper presents the validation results of the hourly global horizontal irradiance (GHI) and direct normal irradiance (DNI), i.e., beam irradiance at normal incidence, of versions four and five of HC3 at seven Egyptian sites. The validation is performed for all-sky conditions, as well as cloud-free conditions. Both versions of HC3 provide similar performances whatever the conditions. Another comparison is made with the estimates provided by the McClear database that is restricted to cloud-free conditions. All databases capture well the temporal variability of the GHI in all conditions, McClear being superior for cloud-free cases. In cloud-free conditions for the GHI, the relative root mean square error (RMSE) are fairly similar, ranging from 6% to 15%; both HC3 databases exhibit a smaller bias than McClear. McClear offers an overall better performance for the cloud-free DNI estimates. For all-sky conditions, the relative RMSE for GHI ranges from 10% to 22%, except one station, while, for the DNI, the results are not so good for the two stations with DNI measurements.

Keywords: Atmosphere; Model; Solar radiation; Surface solar Irradiance.

2. An Aggregated Climate Teleconnection Index Linked to Historical Egyptian Famines of the Last Thousand Years

Michael M Santoro, Fekri A Hassan, MM Abdel Wahab, Randall S Cerveny and Robert C Balling Jr

Variations in the Nile River water level have been historically associated with social development of the Egyptian civilization, particularly through times of famine. In addition, the Nile River water levels have been strongly linked to variations in climate teleconnections, specifically El Niño /Southern Oscillation, the North Atlantic Oscillation (NAO), and the Pacific Decadal Oscillation. In this paper, we demonstrate that the cumulative effects of these three teleconnections link strongly to the occurrence of famine in Egypt. To create a cumulative response, we employed a principal component analysis (PCA) of the reconstructions of these three climate teleconnections that yielded a composite accounting for 61% of the total variance in the three datasets. We compared that analysis to a new compilation of drought and famine in Egypt. Analysis reveals 8 of 10 major famines in Egypt over the last thousand years correspond to low points or downward movements in a detrended composite eigenvector of the three major climate teleconnections discussed. This Southern Oscillation Index–NAO (SOI-NAO) eigenvector has a statistically significant discrimination between the occurrence of famine and non- occurrence of famine (t=2.56; p=0.013). Additionally, the composite climate eigenvector correctly identifies 50 out of 80 events (63%) of lesser incident years mentioned in other Arabic texts. While this climate composite teleconnection analysis alone does not explain all famine events in Egypt over the last thousand years, the relative strength of linkage suggests that potential exists to account for even older (e.g. Egyptian Empire) famines as climate reconstructions extending further back in time become available.

Keywords: Eigenvector; Famine; Nile; NAO; PDO; SOI.

3. Filaments Disappearances in Relation to Solar Flares During the Solar Cycle 23

R. Mawad, Mosalam Shaltout, M. Ewaida, M. Yousef and S. Yousef

We studied the association between the filament disappearances and solar flares during 1996–2010; we listed 639 associated filament disappearances with solar flares under temporal and spatial condition, those particular 639 filament disappearance were associated with 1676 solar flares during the period 1996–2010. The best angular distance between filament disappearances and associated solar flares ranged between 30° and 60°. The number of the associated events increased with increasing solar activity and decreased with quiet sun. The location of filament disappearances ranges between latitude ±50° and longitude ±70°. We found that longer filament disappearances have activity and ability of contemporary association with flares more than shorter filament disappearance, filament disappearance powers the associated flares more than non-associated flares events. The associated flares have higher solar flux, longer duration, and higher importance compared to non-associated flares with filament disappearance. In addition the associated filament disappearance with flares have two types depending on their duration, short-lived (<9 h), and long-lived (>9 h).

Keywords: Filament; Filament disappearance; Solar flare.

4. Filaments Disappearance in Relation to Coronal Mass Ejections During the Solar Cycle 23

R. Mawad, Mosalam Shaltout, M. Yousef, S. Yousef and M. Ewaida

We have studied the relationship between filament disappearances with CMEs during solar period 1996–2010. We used the observed disappearing filaments in Ha data from Meudon given in NOAA, and coronal mass ejections data (CMEs) from SOHO/LASCO. We obtained 278 CME events (14%) contemporary filament disappearances and CME ejections (from a total of 2018 filament disappearance events and 15,874 CME events during 1996–2010). We found that the number of associated CME–filament disappearance events increased with the increase of the solar activity and significantly decreased with quiet sun. The longer filament disappearances have activity and ability to contemporary association with CMEs more than shorter filament disappearances. The filament disappearance powers the associated CMEs. CMEs which are associated with filament

disappearance are ejected with higher speeds, massive, more energetic, and smaller angular width compared to non-associated CME events. In addition, the associated filament disappearance CMEs have two types depending on their duration; short-lived (<9 h), and long-lived (>9 h).

Keywords: Filament; Filament disappearance; Coronal mass ejection; CME.

5. Mann–kendall Trend Analysis of Surface Air Temperatures and Rainfall in Iraq

El-Sayed M. Robaa and Zhian Al-Barazanji

IDŐJÁRÁS, 119: 493-514 (2015) IF: 0.5

In this study, trends of the seasonal and annual maximum (T_{max}), minimum (T_{min}), and mean (T) air temperatures, as well as rainfall amounts (Ra) time series were investigated for eleven stations in Iraq for the period 1972–2011 (40 years). Four statistical tests including homogeneity, Mann–Kendall (MK), Sen's slope estimator and linear regression were used for the analysis. The results revealed that annual mean of Tmax, Tmin, and T time series showed statistically significant increasing trends over 81.8, 100, and 100% of the stations at the 0.001 level and they experienced an increase of 0.50, 0.67, and 0.58 °C/decade, respectively; while the annual rainfall has shown decreasing trends at 90.9% of the stations and it experienced a decrease of – 20.50 mm/decade. Seasonally, the highest increase of Tmax, Tmin, and T values have been found over the extreme south of the country during summer at the rates of 1.47, 1.06, and 1.16 °C/decade, respectively, while the highest decrease of Ra values has been found in the northern part of the country during winter at the rate of –36.35 mm/decade.

Keywords: Climate change; Air temperature; Rainfall; Mann-kendall test; Trends; Iraq.

6. Analytical and Numerical Solutions of Crosswind Integrated Conc Entration by Using Different Eddy Diffusivities Methods

M. Abdel-Wahab, Khaled S. M. Essa, M. Embaby and Sawsan E. M. Elsaid

Mausam: Quarterly Journal of Meteorology, Hydrology & Geophysics, 66: 785-792 (2015) IF: 0.181

The objective of this paper is to calculate the concentration o f air pollution, by solving the Atmospheric Diffusion Equation (ADE) using Laplace transform an d Adomian decomposition methods. The solution depends on eddy diffusivity profile (K) and wind speed at the r eleased point (u). We solve the ADE analytically in two dimensions using Laplace transform method and get the inversion of Laplace analytically and solving it numerically using Adomian decomposition method, then, compared our results with observed data.

Keywords: Crosswind integrated concentration; Eddy diffusivities methods.

7. Unification Principle and A Geometric Field Theory

Mamdouh I. Wanas, Samah N. Osman and Reham I. El-Kholy

Open Physics, 13: 247-262 (2015)

In the context of the geometrization philosophy, a covariant field theory is constructed. The theory satisfies the unification principle. The field equations of the theory are constructed depending on a general differential identity in the geometry used. The Lagrangian scalar used in the formalism is neither curvature scalar nor torsion scalar, but an alloy made of both, the W-scalar. The physical contents of the theory are explored depending on different methods. The analysis shows that the theory is capable of dealing with gravity, electromagnetism and material distribution with possible mutual interactions. The theory is shown to cover the domain of general relativity under certain conditions.

Keywords: Anti-curvature; Unified field theory; Poisson equation; Absolute parallelism; Schwarzschild solution.

Dept. of Biophysics

8. Structural Aspects of N-Glycosylations and the C-Terminal Region in Human Glypican-1

Wael Awad, Barbara Adamczyk, Jessica Örnros, Niclas G. Karlsson, Katrin Mani and Derek T. Logan

Journal of Biological Chemistry, 290: 22991-23008 (2015) IF: 4.573

Glypicans are multifunctional cell surface proteoglycans involved in several important cellular signaling pathways. Glypican-1 (Gpc1) is the predominant heparan sulfate pro- teoglycan in the developing and adult human brain. The two N-linked glycans and the C-terminal domain that attach the core protein to the cell membrane are not resolved in the Gpc1 crystal structure. Therefore, we have studied Gpc1 using crys- tallography, small angle x-ray scattering, and chromatographic approaches to elucidate the composition, structure, and func- tion of the N-glycans and the C terminus and also the topology of Gpc1 with respect to the membrane. The C terminus is shown to be highly flexible in solution, but it orients the core protein transverse to the membrane, directing a surface evolutionarily conserved in Gpc1 orthologs toward the membrane, where it may interact with signaling molecules and/or membrane recep- tors on the cell surface, or even the enzymes involved in heparan sulfate substitution in the Golgi apparatus. Furthermore, the N-glycans are shown to extend the protein stability and lifetime by protection against proteolysis and aggregation.

Keywords: Mass spectrometry; N-linked glycosylation; Proteoglycan; Small-angle X-ray scattering; Structure-function; Glypican-1.

9. Doxorubicin Loaded Magnetic Gold Nanoparticles for in Vivo Targeted Drug Delivery

Nihal Saad Elbialy, Mohamed Mahmoud Fathy and Wafaa Mohamed Khalil

International Journal of Pharmaceutics, 490: 190-199 (2015) IF: 3.65

Treatment of approximately 50% ofhuman cancers includes the use ofchemotherapy. The major problem associated with chemotherapy is the inability to deliver pharmaceuticals to specific site of the body without inducing normal tissue toxicity. Latterly, magnetic targeted drug delivery (MTD) has been used to improve the therapeutic performance of the chemotherapeutic

agents and reduce the severe side effects associated with the conventional chemotherapy for malignant tumors. In this study, we were focused on designing biocompatible magnetic nanoparticles that can be used as a nanocarrier's candidate for MTD regimen. Magnetic gold nanoparticles (MGNPs) were prepared and functionalized with thiol-terminated polyethylene glycol (PEG), then loaded with anti-cancer drug doxorubicin (DOX).

The physical properties of the prepared NPs were characterized using different techniques. Transmission electron microscopy (TEM) revealed the spherical mono-dispersed nature of the prepared MGNPs with size about 22 nm. Energy dispersive X-ray spectroscopy (EDX) assured the existence of both iron and gold elements in the prepared nanoparticles.

Fourier transform infrared (FTIR) spectroscopy assessment revealed that PEG and DOX molecules were successfully loaded on the MGNPs surfaces, and the amine group of DOX is the active attachment site to MGNPs. In vivo studies proved that magnetic targeted drug delivery can provide a higher accumulation ofdrug throughout tumor compared with that delivered by passive targeting. This clearly appeared in tumor growth inhibition assessment, biodistribution ofDOX in different body organs in addition to the histopathological examinations of treated and untreated Ehrlich carcinoma. To assess the in vivo toxic effect of the prepared formulations, several biochemical parameters such as aspartate aminotransferase (AST), alanine transaminase (ALT), lactate Dehydrogenase (LDH), creatine kinase MB (CK-MB), urea, uric acid and creatinine were measured. MTD technology not only minimizes the random distribution of the chemotherapeutic agents, but also reduces their side effects to healthy tissues, which are the two primary concerns in conventional cancer therapies.

Keywords: Nanoparticles Doxorubicin Drug Delivery Iron Oxide Nanoparticles Magnetic Targeted Drug Delivery Biodistribution.

10. Melanin Nanoparticles (MNPS) Provide Protection Against Wholebody γ-Irradiation in Mice Via Restoration of Hematopoietic Tissues

Monira M. Rageh, Reem H. EL-Gebaly, H. Abou-Shady and Doaa G. Amin

During radiotherapy, ionizing irradiation interacts with biological systems to produce free radicals, which attack various cellular components. The hematopoietic system is easily recognized to be radiosensitive and its damage may be severe. Melanin nanoparticles (MNPS) act as free radical scavengers prepared by polymerization of dopamine. In this study, a total of 110 male BALB/C mice were divided into five equal groups. Each group contained 22 mice. Mice of group A did not receive MNPs or irradiation (control group), group B was injected intraperitoneally (i.p.) with 50 mg/kg MNPs. Mice of group C and D were exposed to a dose of 7 Gy γ-irradiation and injected with the same dose of MNPs as in group B either 30 min pre- or post-irradiation, and group E was exposed to a dose of 7Gy γ-irradiation only. The impact of MNPs on peripheral blood, spleen, and DNA damage induced by irradiation was evaluated by blood count, histopathology of the spleen, and comet assay for the DNAin the bone marrow at 1, 4, 8, and 12 days post-irradiation. Results of group E compared with control group (A) showed a significant depression in complete blood count. Additionally,

histopathological observation showed the absence of megakaryocytes with delayed time post-irradiation, deposition of eosinophilic protein of their spleen appeared, as well as a remarkable decrease in spleen size was observed. Moreover, γ-irradiation-induced DNA damage as can be inferred from a significant increase by about 5–10 folds in all comet parameters (% of DNA, tail length, tail moment, and olive moment) in the DNA of the bone marrow. In contrast, pre-post treatment with MNPs protected hematopoietic tissues against radiation damage, and therefore, enhanced the survival of mice with 40 % in groups (C&D) compared with 10%to group (E) till 30 days post-irradiation. In conclusion, these results demonstrated that synthetic MNPs provide significant radioprotection to the hematopoietic tissues.

Keywords: Melanin nanoparticles; Radioprotection; γ-irradiation; DNA damage.

11. The QSAR and Docking Calculations of Fullerene Derivatives as HIV-1 Protease Inhibitors

Noha A. Saleh

The inhibition of HIV-1 protease is considered as one of the most important targets for drug design and the deactivation of HIV-1. In the present work, the fullerene surface (C60) is modified by adding oxygen atoms as well as hydroxymethylcarbonyl (HMC) groups to form 6 investigated fullerene derivative compounds. These compounds have one, two, three, four or five O atoms + HMC groups at different positions on phenyl ring. The effect of the repeating of these groups on the ability of suggested compounds to inhibit the HIV protease is studied by calculating both Quantitative Structure Activity Relationship (QSAR) properties and docking simulation.

Based on the QSAR descriptors, the solubility and the hydrophilicity of studied fullerene derivatives increased with increasing the number of oxygen atoms + HMC groups in the compound. While docking calculations indicate that, the compound with two oxygen atoms + HMC groups could interact and binds with HIV-1 protease active site. This is could be attributed to the active site residues of HIV-1 protease are hydrophobic except the two aspartic acids. So that, the increase in the hydrophilicity and polarity of the compound is preventing and/or decreasing the hydrophobic interaction between the compound and HIV-1 protease active site.

Keywords: Docking Fullerene HIV-1 Protease Inhibitors Hydroxymethylcarbonyl Group Pm3 QSAR.

12. An Efficient Numerical Method for Protein Sequences Similarity Analysis Based on A New Two-Dimensional Graphical Representation

A. El-Lakkani and H. Mahran

A new two-dimensional graphical representation of protein sequences is introduced. Twenty concentric evenly spaced circles divided by n radial lines into equal divisions are selected to represent any protein sequence of length n. Each circle represents

one of the different 20 amino acids, and each radial line represents a single amino acid of the protein sequence. An efficient numerical method based on the graph is proposed to measure the similarity between two protein sequences. To prove the accuracy of our approach, the method is applied to NADH dehydrogenase subunit 5 (ND5) proteins of nine different species and 24 transferrin sequences from vertebrates. High values of correlation coefficient between our results and the results of ClustalW are obtained (approximately perfect correlations). These values are higher than the values obtained in many other related works.

Keywords: Similarity analysis; Protein sequences; Graphical representation; Mathematical.

13. Evaluation of Varying Physical Acquisition Parameters in Gamma Camera Gated Cardiac SPECT

Reem H. Elgebaly, Monira M. Rageh and Mahmoud Adel

Journal of X-Ray Science And Technology, 23: 453-461 (2015) IF: 1.398

Background: There are various physical factors that limit the quality of the Single Photon Emission Computed Tomography (SPECT) images such as number of frames per projection, number of projections per scan and time per projection in gated myocardial SPECT scan.
Objective: The aim of the present work was to evaluate physical acquisition parameters affecting the cardiac imaging to optimize the patient's examination time and image quality that are acquired with the gamma camera and workers radiation protection (through reducing time of radiation exposure) in cardiac SPECT facility. Cardiac functional parameters like ejection fraction (EF), end diastole volume (EDV), end systole volume (ESV) and total perfusion defect (TPD) were evaluated.
Methods: Thirty patients were divided into three groups as follows:
1- Group (1): contains two sub-groups, one scanned with 8 frames per projection, the other with 16 frames per projection.
2- Group (2): contains two sub-groups, one scanned with 32 projections per scan, the other with 16 projections per scan.
3- Group (3): contains two sub-groups, one scanned at a time per projection of 20 s and the other scanned at 10 s per projection. Parameters such as the Ejection Fraction (EF), End Diastole Volume (EDV), End Systole Volume (ESV) and Total Perfusion Defect (TPD) in SPECT were compared for each group.
Results: There was insignificant difference in the EF, EDV, ESV and TPD between the different groups concerning the number of frames per projection, number of projections per scan and time per projection.
Conclusion: The reduction of scan time to half or the number of projections per scan to half or increasing the number of frames per scan from 8 to 16 at the same duration has insignificant effect in the cardiac functional parameters used with gated SPECT scan
Keywords: Gated SPECT; Physical acquisition parameters; Filtered back projections (FBP); Gamma camera.

14. Computational Approaches to Study Peptidomimetic and Macrocyclic Hepatitis C Virus NS3 Protease Inhibitors

Ahmed A. Ezat, Hamdy I. Mostafa, Nihal. S. El-Bialy, Noha A. Salehand and Medhat A. Ibrahim

Journal of Computational And Theoretical Nanoscience, 12: 52-59 (2015) IF: 1.343

Based on the sequences of NS3/NS4A, NS4A/NS4B, NS4B/NS5A and NS5A/NS5B junctions, two groups of HCV NS3 protease inhibitors are suggested. The first group has neutral compounds, while the second group has charged compounds. Each group has tetrapeptides, hexapeptides and macrocyclic structures. Using PM3 method, the electronic and QSAR properties are calculated. Accordingly, P1–P3 macrocycle of 4A/4B hexapeptide sequence (DEMEEC) is the most stable and hydrophilic in the first group. While the charged compounds in second group are more reactive and soluble than first group. The best compound and its charged counterpart are further studied at B3LYP/6-31G (d, p) and HF/6-31G (d, p) methods. The difference in position and energies of HOMO and LUMO between the two compounds infers different mechanisms of action between them and they react differently from a chemical point of view. These two compounds are well suited to be good inhibitors of HCV NS3 protease.
Keywords: HCV; Macrocyclic; Molecular modeling; NS3 protease; QSAR

15. Theoretical Study on Modified Boceprevir Compounds as NS3 Protease Inhibitors

Noha A. Saleh, Ahmed A. Ezat, Abdo A. Elfiky, Wael M. Elshemey and Medhat Ibrahim

Journal of Computational And Theoretical Nanoscience, 12: 371-375 (2015) IF: 1.343

This study is an attempt to improve the biological activity of boceprevir, an important HCV-NS$_3$ protease inhibitor. This is performed through the suggestion of 8 modified compounds of boceprevir and testing their biological activity in silico. At PM3 level of theory, the electronic and Quantitative Structure Activity Relationship (QSAR) descriptors of the suggested compounds are calculated. Based on the values of these descriptors, the proposed compound 7 (with fluorinated sulfonamide at position R_1, 1,3-dithiolane ring at position R_2 and cyclopropane at position R_3) has better biological activity as NS$_3$ protease inhibitor than unmodified boceprevir.
Keywords: Boceprevir; HCV; NS$_3$ Protease inhibitor; PM$_3$; QSAR.

16. 2'-Methylguanosine Prodrug (IDX-184), Phosphoramidate Prodrug (Sofosbuvir), Diisobutyryl Prodrug (R7128) are Better than their Parent Nucleotides and Ribavirin in Hepatitis C Virus Inhibition: A Molecular Modeling Study

Abdo A. Elfiky, Wael M. Elshemey and Wissam A. Gawad

Journal of Computational and Theoretical Nanoscience, 12: 376-386 (2015) IF: 1.343

2'-Methylguanosine prodrug (IDX-184), Phosphoramidate prodrug (Sofosbuvir), Diisobutyryl prodrug (R7128) are Hepatitis C Virus (HCV) Non-Structural 5B (NS5B) RNA dependent RNA polymerase (RdRp) Nucleoside Inhibitors (NI) that are currently in clinical trials. The activated forms of these Direct Acting Antiviral (DAA) drugs act on NS5B RdRp. The present work utilizes a molecular modeling approach in order to study the interaction between the activated drugs and their parent nucleotides with the 12 amino acids constituting a 5 Å region surrounding the active site motif GDD for HCV subtypes 1a, 2b, 3b and 4a. The analysis of their interaction energies (calculated using semi-empirical method PM3) and their vibrational properties with the polymerase suggests that their inhibitory performance likely to be more potent than native nucleotides and Ribavirin (up to date antiviral therapy).

Keywords: DAA; HCV; Molecular modeling; NS5B; Nucleotide inhibitor; Vibrational spectrum.

17. Ehrlich Tumor Inhibition Using Doxorubicin Containing Liposomes

Nihal Saad Elbialy and Mohsen Mahmoud Mady

Ehrlich tumors were grown in female balb mice by subcutaneous injection of Ehrlich ascites carcinoma cells. Mice bearing Ehrlich tumor were injected with saline, DOX in solution or DOX encapsulated within liposomes prepared from DMPC/CHOL/DPPG/PEG-PE (100:100:60:4) in molar ratio. Cytotoxicity assay showed that the IC50 of liposomes containing DOX was greater than that DOX only. Tumor growth inhibition curves in terms of mean tumor size (cm3) were presented. All the DOX formulations were effective in preventing tumor growth compared to saline. Treatment with DOX loaded liposomes displayed a pronounced inhibition in tumor growth than treatment with DOX only. Histopathological examination of the entire tumor sections for the various groups revealed marked differences in cellular features accompanied by varying degrees in necrosis percentage ranging from 12% for saline treated mice to 70% for DOX loaded liposome treated mice. The proposed liposomal formulation can efficiently deliver the drug into the tumor cells by endocytosis (or passive diffusion) and lead to a high concentration of DOX in the tumor cells. The study showed that the formulation of liposomal doxorubicin improved the therapeutic index of DOX and had increased anti-tumor activity against Ehrlich tumor models.

Keywords: Liposomes; Doxorubicin; Ehrlich carcinoma; Cytotoxicity; PEG; DPPG.

18. Hypothermia Mitigates Neurochemical Alterations in Rat''s Cerebral Cortex During Status Epilepticus Induced by Pilocarpine

Haitham S. Mohammed

Status epilepticus (SE) is a prolonged seizure activity associated with mortality and morbidity. SE is characterized by changes in neurotransmitter systems and oxidative stress that facilitate cellular damage. These alterations represent the neurochemical mechanisms underlying the initiation and progression of seizure activity and co-existing morbidity. In the present study, amino acid levels (glutamine, glutamate, GABA, aspartate, glycine and taurine) and oxidative stress parameters malondialdehyde (MDA), reduced glutathione (GSH) and nitric oxide NO) were determined in the cerebral cortex during SE induced by pilocarpine in rats. The study has also evaluated the effects of hypothermia, as a physical non-invasive tool, on neurotransmitters and oxidative stress alterations. The results obtained revealed that there are significant increases in glutamate, GABA, glycine and taurine and NO in the cortex of pilocarpinzed rats. Hypothermia pretreatment mitigated most of the alterations induced by pilocarpine and significantly decreased GABA concentration. These findings emphasize the involvement of extrahippocampal amino acid neurotransmitters in pilocarpine-induced SE and the ameliorative role played by hypothermia.

Keywords: Amino acids; Oxidative stress; Epilepsy; Status epilepticus; Hypothermia.

Dept. of Botany

19. One Fungus, Which Genes? Development and Assessment of Universal Primers for Potential Secondary Fungal DNA Barcodes

J.B. Stielow, C.A. Lévesque, K.A. Seifert, W. Meyer, L. Irinyi, D. Smits, R. Renfurm, G.J.M. Verkley, M. Groenewald, D. Chaduli, A. Lomascolo, S. Welti, L. Lesage-Meessen, A. Fave, A.M.S. A-Hatmi,U. Damm,N. Yilmaz, J. Houbraken, L. Lombard, W. Quaedvlieg, M. Binder, L.A.I. Vaas, D. Vu, A. Yurkov, D. Begerow, O. Roehl, M. Guerreiro, A. Fonseca, K. Samerpitak, A.D. van Diepeningen, S. Dolatabadi, L.F. Moreno, S. Casaregola, S. Mallet, N. Jacques, L. Roscini, E. Egidi, C. Bizet,D. Garcia-Hermoso, M.P. Martín, S. Deng, J.Z. Groenewald, T. Boekhout, Z.W. de Beer, I. Barnes, T.A. Duong, M.J. Wingfield, G.S. de Hoog , P.W. Crous, C.T. Lewis, S. Hambleton, T.A.A. Moussa, H.S. Al-Zahrani, O.A. Almaghrabi, G. Louis-Seize, R. Assabgui, W. Mc Cormick, G. Omer, K. Dukik, G. Cardinali, U. Eberhardt, M. de Vries, V. Robert

The aim of this study was to assess potential candidate gene regions and corresponding universal primer pairs as secondary DNA barcodes for the fungal kingdom, additional to ITS rDNA as primary barcode.
Amplification efficiencies of 14 (partially) universal primer pairs targeting eight genetic markers were tested across > 1 500 species (1 931 strains or specimens) and the outcomes of almost twenty thousand (19 577) polymerase chain reactions were evaluated. We tested several well-known primer pairs that amplify: i) sections of the nuclear ribosomal RNA gene large subunit (D1–D2 domains of 26/28S); ii) the complete internal transcribed spacer region (ITS1/2); iii) partial β-tubulin II (*TUB2*); iv) γ-actin (*ACT*); v) translation elongation factor 1-α (*TEF1α*); and vi) the second largest subunit of RNA-polymerase II (partial *RPB2*, section 5–6). Their PCR efficiencies were compared with novel candidate primers corresponding to: i) the fungal-specific translation elongation factor 3 (TEF3); ii) a small ribosomal protein necessary for t-RNA docking; iii) the 60S L10 (L1) RP; iv) DNA topoisomerase I (TOPI); v) phosphoglycerate kinase (PGK); vi) hypothetical protein LNS2; and vii) alternative sections of TEF1a. Results showed that several gene sections are accessible to universal primers (or primers universal for phyla)

yielding a single PCR-product. Barcode gap and multi-dimensional scaling analyses revealed that some of the tested candidate markers have universal properties providing adequate infra- and inter-specific variation that make them attractive barcodes for species identification. Among these gene sections, a novel high fidelity primer pair for TEF1a, already widely used as a phylogenetic marker in mycology, has potential as a supplementary DNA barcode with superior resolution to ITS. Both TOPI and PGK show promise for the Ascomycota, while TOPI and LNS2 are attractive for the Pucciniomycotina, for which universal primers for ribosomal subunits often fail.

Keywords: DNA barcoding; ITS supplement; Molecular taxonomy; Phylogeny; Species identification; Universal primers.

20. Deterioration to Extinction of Wastewater Bacteria by Non-Thermal Atmospheric Pressure Air Plasma as Assessed by 16S rDNA-DGGE Fingerprinting

WaelS.El-Sayed, SalamaA.Ouf and Abdel-Aleam H. Mohamed

Frontiers In Microbiology, 64: (2015) IF: 3.99

The use of cold plasma jets for inactivation of a variety of microorganisms has recently been evaluated via culture-based methods. Accordingly, elucidation of the role of cold plasma in decontamination would be inaccurate because most microbial populations within a system remain unexplored owing to the high amount of yet uncultured bacteria. The impact of cold atmospheric plasma on the bacterial community structure of wastewater from two different industries was investigated by metagenomic-based polymerase chain reaction-denaturing gradient gel electrophoresis (DGGE) utilizing 16S rRNA genes. Three doses of atmospheric pressure dielectric barrier discharge plasma were applied to wastewater samples on different time scales. DGGE revealed that the bacterial community gradually changed and overall abundance decreased to extinction upon plasma treatment. The bacterial community in food processing wastewater contained 11 key operational taxonomic units that remained almost completely unchanged when exposed to plasma irradiation at 75.5 mA for 30 or 60 s. However, when exposure time was extended to 90 s, only Escherichia coli, Coliforms, Aeromonas sp., Vibrio sp., and Pseudomonas putida survived. Only E. coli, Aeromonas sp., Vibrio sp., and P. putida survived treatment at 81.94 mA for 90 s. Conversely, all bacterial groups were completely eliminated by treatment at 85.34 mA for either 60 or 90 s. Dominant bacterial groups in leather processing wastewater also changed greatly upon exposure to plasma at 75.5 mA for 30 or 60 s, with Enterobacter aerogenes, Klebsiella sp., Pseudomonas stutzeri, and Acidithiobacillus ferrooxidans being sensitive to and eliminated from the community. At 90 s of exposure, all groups were affected except for Pseudomonas sp. and Citrobacter freundii.

The same trend was observed for treatment at 81.94 mA. The variability in bacterial community response to different plasma treatment protocols revealed that plasma had a selective impact on bacterial community structure at lower doses and potential bactericidal effects at higher doses.

Keywords: Dielectric barrier bischarge plasma; Wastewater; DGGE; 16S rDNA; Bacterial community.

21. Coumarin Pretreatment Alleviates Salinity Stress in Wheat Seedlings

Ahmed Mahmoud Saleh and M.M.Y. Madany

Plant Physiology and Biochemistry, 88: 27-35 (2015) IF: 2.756

The potentiality of COU to improve plant tolerance to salinity was investigated. Wheat grains were primed with COU (50 ppm) and then grown under different levels of NaCl (50, 100, 150 mM) for two weeks. COU pretreatment improved the growth of wheat seedling under salinity, relative to COU-untreated seedlings, due to the accumulation of osmolytes such as soluble sugars and proline. Moreover, COU treatment significantly improved $K+/Na+$ ratio in the shoots of both salt stressed and un-stressed seedlings. However, in the roots, this ratio increased only under non-salinity. In consistent with phenylalanine ammonia lyase (PAL), phenolics and flavonoids were accumulated in COU-pretreated seedlings under the higher doses of salinity, relative to COU-untreated seedlings. COU primed seedlings showed higher content of the coumarin derivative, scopoletin, and salicylic, chlorogenic, syringic, vanillic, gallic and ferulic acids, under both salinity and non-salinity conditions. Salinity stress significantly improved the activity of peroxidase (POD) in COU-pretreated seedlings. However, the effect of COU on the total antioxidant capacity (TAC) was only obtained at the highest dose of NaCl (150 mM). The present results suggest that COU pretreatment could alleviate the adverse effect of salinity on the growth of wheat seedlings through enhancing, at least partly, the osmoregulation process and antioxidant defense system.

Keywords: Coumarin; Salinity; Wheat; Osmolytes; Phenolics; Flavonoids; PAL; POD.

22. Inhibitory Effect of Silver Nanoparticles Mediated by Atmospheric Pressure Air Cold Plasma Jet Against Dermatophyte Fungi

Salama A. Ouf, Amira A. El-Adly and Abdel-Aleam H. Mohamed

Journal of Medical Microbiology, 64: 1151-1161 (2015) IF: 2.248

In an in vitro study with have clinical isolates of dermatophytes, the MIC50 and MIC100 values of silver nanoparticles (AgNPs) ranged from 5 to16 and from 15 to 32 ug ml $^{-1}$, respectively. The combined treatment of AgNPs with atmospheric pressure-air cold plasma (APACP) induced a drop in the MIC50 and MIC100 values of AgNPs reaching 3–11 and 12–23 ug ml $^{-1}$, respectively, according to the examined species. Epidermophyton floccosum was the most sensitive fungus to AgNPs, while Trichophyton rubrum was the most tolerant. AgNPs induced significant reduction in keratinase activity and an increase in the mycelium permeability that was greater when applied combined with plasma treatment. Scanning electron microscopy showed electroporation of the cell walls and the accumulation of AgNPs on the cell wall and inside the cells, particularly when AgNPs were combined with APACP treatment. An in vivo experiment with dermatophyte-inoculated guinea pigs indicated that the application of AgNPs combined with APACP was more effcacious in healing and suppressing disease symptoms of skin as compared with the application of AgNPs alone. The recovery from the infection reached 91.7 % in the case of Microsporum canis-inoculated guinea pigs treated with 13 ug ml $^{-1}$ AgNPs

combined with APACP treatment delivered for 2 min. The emission spectra indicated that the efficacy of APACP was mainly due to generation of NO radicals and excited nitrogen molecules. These reactive species interact and block the activity of the fungal spores in vitro and in the skin lesions of the guinea pigs. The results achieved are promising compared with fluconazole as reference antifungal drug

Keywords: Silver nanoparticles; Cold plasma; Keratinase; Sem; Dermatophytes.

23. The Effect of Coumarin Application on Early Growth and Some Physiological Parameters in Faba Bean (Vicia Faba L.)

Ahmed Mahmoud Saleh, Mahmoud M. Y. Madany and Luı´s Gonza´lez

Many coumarins have been identified from natural sources, especially green plants. These compounds affect many plant activities and can also control growth processes. The effect of coumarin (COU) on germination, early growth, nutrient mobilization, and some physiological parameters of faba bean (Vicia faba L.) was researched. Seeds of faba bean were primed with different concentrations of COU (0.5, 1.0, 2.0, and 4.0 mM) to elucidate the effect on germination and nutrient mobilization. Accordingly, a greenhouse pot experiment was conducted to study the effect of 1.0 mM COU, as a seed priming treatment alone or in combination with foliar application, on the growth parameters, some biochemical constituents from primary and secondary metabolism and phytohormones of faba bean. The impact of COU was more pronounced on growth than germination, and was dependent on concentration and the mode of application. Both COU treatments significantly improved the level of primary and secondary metabolites as well as phytohormones. These data suggest that COU can affect the growth and physiology of faba bean either directly, as an active growth substance, or indirectly by its interaction with the metabolism of phytohormones.

Keywords: Coumarin Vicia Faba Phytohormones Germination Growth Sugars Proteins Phenolics.

24. Phytoremediation of Soils Polluted With Crude Petroleum Oil Using Bassia Scoparia and Its Associated Rhizosphere Microorganisms

H.A. Moubasher, A.K. Hegazy, N.H. Mohamed and Y.M. Moustafa, H.F. Kabiel and A.A. Hamad

The ability of Bassia scoparia (L.) A. J. Scott to remediate petroleum-contaminated arid land sandy soil was studied with natural and sterilized soils, and with supplemental nutrients and water. The species showed good tolerance of petroleum hydrocarbons (PHs) in soils reaching 2e3% (oil:soil by mass) pollution levels. After five months of phytoremediation, the average degradation rate of petroleum hydrocarbons ranged between 31.2 ± 1.15e57.7 ± 1.29% for natural soil and 28.7 ± 1.04e51.1 ± 1.53% for pre-sterilized soil. The highest breakdown of PHs for both saturated and poly-aromatic fractions was

achieved when plants were present. Changes in saturated and aromatic fractions were monitored and measured using gas chromatography and high performance liquid chromatography. Moderate concentrations of PHs activated specialized oil-degrading microorganisms which in turn promoted the efficiency of phytoremediation. Polluted soils planted with B. scoparia also showed a significant reduction in sulfur levels. The potential demonstrated for remediation of petroleum hydrocarbons and sulfur by B. scoparia suggests it may be a useful tool for remediation of arid land soils contaminated with crude oil.

Keywords: Petroleum Hydrocarbons, Normal-Paraffin, Poly-Aromatic Hydrocarbons (PAHS); Sulfur; Degradation rate; Bioremediation; Arid land soils.

25. Fungal Decontamination of Fleshy Fruit Water Washes by Double Atmospheric Pressure Cold Plasma

Salama A. Ouf, Abdel-Aleam H. Mohamed and Wael S. El-Sayed

The washwater from strawberries had the highest level of contamination by fungal species compared to washwater from cherries or red grapes. The fungal counts in the washwater from moldy fruits were much higher than those recovered from healthy fruits. Aspergillus niger and Penicillium italicum were the most dominant fungi isolated from the fruit washwater. Treatment of the washwater with double atmospheric pressure cold plasma (DAPCP) for 7.5min induced a significant reduction in the colony forming units of fungal species that reached 74.7–100% in the washwater of cherries. The variation in plasma efficacy for the different samples was dependent on the level of antioxidants in the washwater, which attenuated the oxidizing radicals and reduced the life span of the reactive species generated by the plasma, particularly oxygen radicals. Upon DAPCP treatment, the spores of A. niger exhibited electroporation in their walls. The treatment of the washwater with DAPCP for 9min induced a steady reduction in the amount of mycotoxins in the washwater of moldy fruits, reaching reductions of 87.93, 66.42, and 72.00% for aflatoxins, fumonisins, and ochratoxins, respectively, in the washwater from cherries.

Keywords: Cold plasma; Fungal contamination; Mycotoxins; Wastewater.

26. Effect of Copper and Zinc on the in Vitro Regeneration of Rauvolfia Serpentine

N. Ahmad, A.A. Alatar, M. Faisal, M.I. Khan, N. Fatima, M. Anis, and A.K. Hegazy

The present study exemplifies morphogenic roles played by copper and zinc during micropropagation of Rauvolfia serpentina, an important medicinal shrub. Incorporation of 20 µM CuSO4 or 25 µM ZnSO4 to a Murashige and Skoog (MS) medium with optimized concentrations of auxins and cytokinins induced a maximum number of shoots per explant (40.67 ± 1.76 and 45.47 ± 0.24, respectively). However, higher concentrations of both micronutrients negatively affected the morphogenic potential. The pigment content of the regenerants increased up to the optimal concentrations of both metals and thereafter decreased, whereas

the maximum proline content was at the highest concentrations used. In vitro rooting of healthy shoots was accomplished using 0.5 µM IBA in a half strength liquid MS medium with 8.20 ± 0.37 roots, and root length of 5.50 ± 0.14 cm per microshoot. The plants survived a hardening procedure and were successfully acclimatized to field conditions with 95 % survival.

Keywords: Auxin; Clonal propagation; Cytokinin; Ex vitro transfer; Micronutrients; Morphogenesis; Nodal segments.

27. Inhibitory Effect of Double Atmospheric Pressure Argon Cold Plasma on Spores and Mycotoxin Production of Aspergillus Niger Contaminating Date Palm Fruits

Salama A Ouf, Abdulrahman H Basher and Abdel-Aleam H Mohamed

Background: Aspergillus niger has been reported as a potentially dangerous pathogen of date-palm fruits in Saudi Arabia due to the production of fumonisin B2 (FB2) and ochratoxin A (OTA). In a trial to disinfect this product, a double atmospheric pressure argon cold plasma (DAPACP) jet system was set up and evaluated against spore germination and mycotoxin production of the pathogen.

Results: The plasma jets were characterised photographically, electrically and spectroscopically. DAPACP jet length increases with the increase of argon flow rate, with optimum rate at 3.5Lmin(-1) . The viability of A. niger spores, inoculated onto sterilised date palm fruit discs, progressively decreases with extension of the exposure time of DAPACP due to the more quantitative amount of OH and O radicals interacting with the examined samples. There was a progressive reduction of the amount of FB2 and OTA detected in date palm discs on extension of the exposure time of the plasma-treated inoculums at flow rate of 3.5Lmin(-1) . FB2 was not detected in the discs inoculated with 6-min plasma-treated A. niger, while OTA was completely absent when the fungus was treated for 7.5min.

Conclusion: DAPACP showed promising results in dry fruit decontamination and in inhibition of mycotoxin release by A. niger contaminating the fruits. The progress in the commercial application of cold plasma needs further investigation concerning the ideal width of the plasma output to enable it to cover wider surfaces of the sample and consequently inducing greater plasma performance.

Keywords: Aspergillus niger; Cold plasma; Date palm; Inactivation; Mycotoxins.

28. Effects of Open Grazing and Livestock Exclusion on Floristic Composition and Diversity in Natural Ecosystem of Western Saudi Arabia

Saud L. Al-Rowaily Magdy I. El-Bana, Dhafer A. Al-Bakre, Abdulaziz M. Assaeed, Ahmad K. Hegazy and Mohammed Basharat Ali

Livestock grazing is one of the main causes of rangeland degradation in Saudi Arabia. Fencing to exclude grazers is one of the main management practices used to restore vegetation and conserve biodiversity. The main objectives of this study were to investigate the changes in plant diversity and abundance, floristic composition and plant groups of the major life forms in response to thirty-five years of grazing exclosure in western Saudi Arabia. These vegetation attributes and palatability were compared in 30 sampling stands located in the excluded and grazed sites. Our results showed that livestock exclusion significantly increased covers, density and species richness of annuals, grasses, perennial forbs, shrubs and trees. Exclosure enhanced the abundance and richness of palatable species and depressed the development of weedy species. About 66.7% of the recorded species at the excluded site were highly palatable compared to 34.5% at the grazed site. In contrary, about 55.2% unpalatable species were found in the grazed site compared to 25.8% in the protected site. Jaccard's similarity index between the excluded and grazed sites showed lower values of 0.39%, 0.40% and 0.31% at levels of families, genus and species, respectively. The results suggest that establishing livestock exclusion may be a useful sustainable management tool for vegetation restoration and conservation of plant diversity in degraded rangelands of arid regions.

Keywords: Protection; Fencing; Grazing impacts; Rangeland steppes; Restoration.

29. Evidence for "Gibberellin-Like" Activity of Coumarin

A.M. Saleh and W. Abu El-Soud

The existing body of information defines some regulatory functions to secondary metabolites like coumarin (COU). Experience and some experimental results in our laboratory tempted us to test a GA-like activity of COU. Experiments were conducted with endospermic (de-embryonated) and embryonic wheat half grains treated with different concentrations of COU, for different time courses, alone or in combination with the GA-biosynthesis inhibitor paclobutrazol (P). Results showed that treatment with COU caused stimulation of amylase synthesis and secretion from aleurone layer cells. P did not affect synthesis but slightly reduced excretion of amylase. However, germination percentage of intact wheat grains and seedling growth were inhibited by COU in a concentration-dependent manner. This indicates that COU has some GA-like effect, and also affects other aspects of germination and seedling establishment. This GA-like effect was also confirmed by the observed increase in elongation of wheat seedlings second leaf sheath and pea stem when treated with COU. These potential regulatory roles of COU may indicate that secondary metabolites have more important roles during different plant developmental processes.

Keywords: Coumarin; Gibberellin; Amylase; Aleurone; Wheat; Pea.

30. Detoxification of Patulin by Kombucha Tea Culture

Ahmed A. Ismaiel, Rasha H. Bassyouni, Zeinat Kamel and Shaimaa M. Gabr

Kombucha is a refreshing beverage, obtained by fermenting sugared tea with a symbiotic culture of acetic acid bacteria and

yeast, consumed for its positive effects on human health. In this study, the potential of kombucha supernatant for reduction of patulin (PAT) of three toxigenic fungal strains (Penicillium expansum LC015096, Talaromyces purpureogenus LC015095, and Acremonium implicatum LC015097) in liquid medium and apple fruit was investigated.

In liquid medium, kombucha up to 10% (v/v) significantly inhibited PAT production of P. expansum by 77.2% and that of T. purpureogenus and A. implicatum by 100%. In apple fruit, inhibition percent of PAT accumulation by the respective fungal strains was 49.8%, 100%, and 53%. In aqueous solution, kombucha cells showed a relative greater PAT uptake capacity than Sacchromyces cerevisiae.

The maximum PAT uptake (64.67% and 60.69%) by viable and heat-treated kombucha cells was achieved at pH 3.0 throughout 48 h incubation, respectively.

Keywords: Kombucha tea; Patulin (PAT); Toxicity; Apple; Biosorption.

31. Vegetation, Floristic Diversity and Size-Classes of Acacia Gerrardii in An Arid Wadi Ecosystem.

Abdulrahman A.Alatar, MohamedA.R.El-Sheikh, Jacob Thomas, AhmadK.Hegazy and Hosam A.ElAdawy

This study focuses on the vegetation ecology, floristic diversity, and dynamics of Acacia gerrardii populations in wadi Huraimla,Central Saudi Arabia. The floristic richness, plant cover, human impact, and demography of A. gerrardii population were monitored in open grazing and managed sites. The applications of TWINSPAN, DCA, and CCA multivariate analysis have produced nine vegetation groups; eight of them were associated with the distribution of A. gerrardii and one group with the surrounding agricultural lands.

The plant communities were separated into three major vegetation groups, viz., Acacia gerrardii-Rhazya stricta representing the open grazing sites, Acacia gerrardii-Lycium shawii-Zilla spinosa representing the managed sites, and Cynodon dactylon-Heliotropium bacciferum-Cenchrus ciliaris dominating the agricultural lands.

The CCA ordination indicated that these parathion of plant species along the first axis was positively affected by EC, K, Na, species richness and human impact, and negatively affected by pH, Mg, and density and age of A. gerrardii populations. Alternatively, the second axis is positively correlated with altitude and Ca content of the soil. Human impact is positively correlated with soil salinity, K and Na contents and negatively correlated with altitude, soil texture, and Mg content. The density of A. gerrardii is positively correlated with pH, Fe, Mn, and Mg contents of the soil, whereas negatively correated with salinity and K and Na contents, species richness, relative evenness, and human impact. Populations of A. gerrardii demonstrated different size-class distrbution patterns with either continuous regeneration inputs or lack of regeneration.

Keywords: Chorotypes; Community classification; Grazing; Lifeforms; Najd plateau; Phytogeography; Saudi Arabia; Species richness.

32. Clonal in Vitro Multiplication of Grey Mangrove and Assessment of Genetic Fidelity Using Single Primer Amplification Reaction (Spar) Methods

Abdulrahman Abdullah Alatar, Mohammad Faisal, Ahmad Kamil Hegazy, Hend Awad Alwathnani and Mohammad Khir Okla

An efficient protocol for clonal multiplication of an important mangrove, Avicennia marina, was developed through in vitro culture of nodal segments obtained from a mature plant. The nodal explant induced multiple shoots when cultured on the Murashige and Skoog (MS) basal medium supplemented with varying concentrations and combinations of 6-benzyladenine (BA) and a-naphthalene acetic acid. The highest response in terms of per cent regeneration (73%), average number of shoots/explant (3.25 § 0.25) and maximum shoot length (5.2 § 0.27 cm) was obtained on the MS medium supplemented with BA 5.0 mmol/L C NAA 1.0 mmol/L C 3 g/L activated charcoal after 8 weeks of culturing. The regenerated shoots were rooted well in the MS medium supplemented with 1.0 mmol/L indole-3-butyric acid with an average of 2.9 § 0.24 roots per microshoot. The rooted plantlets were successfully transferred to pots containing normal garden soil with 70% survival rate. The genetic stability of the regenerated plants was evaluated using single primer amplification reaction (SPAR) methods viz., random amplified polymorphic DNA, directed amplification of minisatellite DNA and intersimple sequence repeat polymorphism. The SPAR analysis revealed monomorphic banding patterns in all in vitro regenerated plantlets of A. marina and similar with that of the mother tree confirming their genetic uniformity and clonal fidelity.

Keywords: Micropropagation; Tissue culture; Genetic stability; RAPD marker; DAMD marker; ISSR marker.

33. Molecular Characterization of Schistosoma Haematobium Species-Specific Diagnostic Antigen (gp23) Using cDNA Library in E. Coli

Emad A. Abada, Mohamed A. Al Abboud, Zeinat K. Mohamed

and Maged M. Al-Sherbeiny

A Schistosoma haematobium cDNA library constructed in λgt-22 was immunoscreened using monospecific anti-gp23 antibodies raised in C57B1/6 mice. One positive clone was obtained by PCR using B+ and B- primers of λgt-22. The PCR product of the clone was of 605 bp. To identify the sequence of the positive clone, it was subcloned into plasmid vector (PCR™ II) and its nucleotide sequence was determined using dideoxy nucleotide termination method. The full-length sequence has a 19 nucleotides poly A tail. The data base analysis revealed a high degree of similarity between the gp23 DNA sequence and the S. haematobium heat shock protein 70 (Hsp70) with 95.8 % identity. Software analysis of the full length of gp23 sequence revealed a long ORF that encode 21.86 kDa protein of 198 amino acids. The sequence submitted to Gene bank under accession number (JN712654) (http:// www. ncbi. nlm. gov). Results of the present work indicate that the gp23 antigen recognized by the monospecific sera is highly immunogenic and related to the Hsp70 family.

Further plans will include expression of the immunogenic molecule encoded by the clone of 605 bp. The specificity and sensitivity of the recombinant form of the serodiagnostic antigen will evaluate before large-scale production.

Keywords: Schistosoma haematobium; gp23; Heat shock protein (Hsp); E. coli.

34. Dermatophytes and Other Associated Fungi in Patients Attending to Some Hospitals in Egypt

Al Shimaa M. Abd Elmegeed, S.A. Ouf, Tarek A.A. Moussa and S.M.R. Eltahlawi

Dermatophytes are keratinophilic fungi that infect keratinized tissues causing diseases known as dermatophytoses. Dermatophytes are classified in three genera, Epidermophyton, Microsporum, and Trichophyton. This investigation was performed to study the prevalence of dermatomycosis among 640 patients being evaluated at the dermatology clinics at Kasr elainy, El-Husein and Said Galal hospitals in Cairo and Giza between January 2005 and December 2006. The patients were checked for various diseases. Tinea capitis was the most common clinical disease followed by tinea pedis and tinea corporis. Tinea cruris and tinea unguium were the least in occurrence. Tinea versicolor also was detected. The most susceptible persons were children below 10 years followed by those aged 31-40 years. Unicellular yeast was the most common etiological agent and T. tonsurans was the second most frequent causative agent followed by M. canis.

Keywords: Dermatophytosis; Dermatophytes; Fungi; Keratinophilic; Prevalence; Dermatology.

35. Flavonoid Profiling and Nodulation of Some Legumes in Response to the Allelopathic Stress of Sonchus Oleraceus

Nasr Hassan Gomaa, Mahmoud Omar Hassan, Gamal Mohammad Fahmy, Luís González, Ola Hammouda and Atteya Mostafa Atteya

Annual sowthistle (Sonchus oleraceus) has been reported to produce allelopathic effects. Two greenhouse experiments were conducted to estimate the allelopathic potential of both plant residue and root exudates of S. oleraceus on flavonoid composition and nodulation in a leguminous crop, Trifolium alexandrinum, and in two leguminous weeds, Melilotus indicus and T. resupinatum. The results of high performance liquid chromatography-mass spectrometry (HPLC- -MS/MS) showed that all three legumes contained six flavonoid aglycones: apigenin, daidzein, kaempferol, luteolin, myricetin and quercetin; and seven flavonoid glycosides: daidzin, genistin, hesperidin, hyperoside, kaempferol-7-O- -glucoside, naringin and rutin. In general, both plant residue and root exudates had inhibitory effects on the flavonoid composition and nodulation of the target species. However, residue of S. oleraceus caused a significant increase in both individual and total detected flavonoids in T. alexandrinum. The results suggest that the phytotoxins released from S. oleraceus may restrain the biosynthesis of flavonoids in

the target species, whereas the accumulated flavonoids in T. alexandrinum are allelopathic-induced metabolites and suggest a resistance mode in this crop.

Keywords: Allelopathy; Flavonoids; Legumes; Nodulation; Sonchus oleraceus.

36. Population Demography and Global Sensitivity Analysis of Avicennia Marina on the Eastern and Western Coasts of Saudi Arabia'

Mohamed Elhag, Ahmad K. Hegazy, Abdulrahman A. Alatar, Mohamed Faisal, Magdi El-Bana, Jarbou A. Bahrawi and Amal A.M. Al-Ghamdi

Mangrove ecosystems are one of the habitats that host high environmental diversity at the level of physical, geomorphological and biological features in arid regions. In Saudi Arabia, mangrove ecosystems are heavily threatened by both natural hazards and human pressure. The total estimated area of mangroves in Safwa Al Khurais, Saudi Arabia, is approximately 20 000 ha in extent and comprises two species: Avicennia marina and Rhizophora mucronata. They supply detritus to the marine food web and play a significant role in the conservation of biological diversity. The main objective of this study was to analyse the demographic population sensitivity of A. marina in two representative sites on the Red Sea and the eastern coast of Saudi Arabia. A sensitivity analysis was used to assess the contributions of the inputs to the total uncertainty in the analysis outcomes. Demographic features affecting mangroves in Saudi Arabia are complex and include various aspects. The phenological phase, tree size, density, cover, number of dead trees and pneumatophore characteristics were considered in this study. A comparative analysis of Gaussian process emulators for performing a global sensitivity analysis was used to conduct a variance-based sensitivity analysis to identify which uncertain inputs drive the output uncertainty. The results showed that the interconnections between different demographic features were predictable, but that the extent of the sensitivity was uncertain. Findings from the current study are anticipated to contribute significantly towards an inclusive mangrove demographic features assessment, and towards the subsequent conservation of mangroves in Saudi Arabia.

Keywords: The Findings of the Current Research Are Discussed in Light of the Application of Sensitivity Analyses Outputs in the Conservation and Management of Mangrove Ecosystems at A National Level.

37. Induced Mutagenesis and Genotoxicity by Accumulated Radionuclides in Some Edible Plants Cultivated in Black Sand Soil Detected by Rapd and Sds-Page

Ahmad K. Hegazy, Mohammad Faisal, Abdulrahman A. Alatar, Hanan F. Kabiel and Mona H. Emam

Assessment of mutagenic effects and DNA damage induced by radioactive elements at molecular level is important in ecotoxicology. In the present study, the radionuclides content was

determined in four crop plant species, namely Eruca sativa M., Solanum lycopersicum L. Pasidium guajava L. and Mangifera indica L. cultivated in the black sand soil. The results revealed the ability of the plants to accumulate a considerable amount of uranium and thorium in the edible portions. The absorbed radionuclide induced damages in DNA as indicated by variations in band intensities, loss of normal band and appearance of new bands in RAPD profiles compared to plants with low radionuclides content. The high level of uranium and thorium in plant tissues caused some changes in SDS-PAGE of proteins reflected by alterations in the band relative mobility and intensities, expression of new proteins and suppression of some proteins. It is concluded that high uranium and thorium content induces mutagenesis and genotoxicity in the four crop plant species. The DNA polymorphism detected by RAPD analysis and SDS-PAGE of proteins could be used as investigation tool for environmental toxicology and as a useful biomarker for the detection of genotoxicity caused by the radionuclides pollution in plants.

Keywords: Ecotoxicology; Proteomics; Thorium; Uranium; DNA fingerprinting; Protein profile.

38. Free Calorie Sweetness and Antimicrobial Properties in Stevia Rebaudiana

Tahany M. A. Abdel-Rahman, Mohamed Ahmed Abdelwahed, Mohsen Abu El-Ela Elsaid and Ahmed Atef El-Beih

The development of healthy foods with fewer calories with antimicrobial activity is a must. Stevia rebaudiana Bertoni produce diterpene glycosides that are low calorie sweeteners, and having therapeutic properties with antimicrobial activity. The present data revealed that among seven extracts, vacuum concentrated methanol-water infusion (1:1) has highest antimicrobial activity against the eleven tested bacterial and fungal species, with B. subtilis, B. cereus being the most susceptible species. Combination between methanol-water extract of S. rebaudiana plus some plant essential oils resulted in 20 out of 55 synergistic cases with higher antimicrobial activity and lower MIC values than single treatment with either Stevia extract or essential oils.

The combination of Stevia extract plus cinnamon oil was the most efficient antimicrobial mixture. Stevia extract revealed higher antimicrobial activity than the tested food preservatives when singly added. Combination between Stevia extract and food preservatives led to 12 of 55 synergistic cases with lower MIC values the single treatment.

Application by adding Stevia extract in substitution of 75% of sucrose in commercial food product in Egyption market "Choco Spread" reduced the count of Enterobacteria, Coliform, yeast, molds, S. aureus and Samonella sp. to the permissible level in foods. The calories in "Choco Spread" decreased by 24.4% in Stevia containing "Choco Spread " than sucrose containing product. The taste and sweetener have been not changed in "Choco Spread" containing Stevia extract.

Keywords: Stevia rebaudiana bertoin; Antimicrobial activity; Essential oils; Food preservative; Choco spread.

39. Copper Enhancement of Dettol Lethality to Candida Albicans

Mohamed M. Ghareb, Mohamed A. Elhefnawy, Mohamed Ibrahim, Azza M. Soliman and Awad A. Elshoura

The overall objective in this study is to explore the exact lethal dose of dettol as an approach to minimize the total amount of unnecessary application. The addition of copper increased the lethality effect of dettol. Different dettol concentrations (10 to100ppm) were used to study the effect of dettol on the pathogenic yeast Candida albicans growth profile using Malt Extract Agar (MEA) and Malt Yeast Glucose Peptone (MYGP) media. The results showed that the fungal growth was inhibited by 24.6% when dettol was used in concentration 30ppm, but with addition of copper by 0.2 mM the fungal growth inhibition increased to 49.2%. Also the addition of 0.1mM as $CuCl_2$ to growth medium with 50 ppm of dettol resulted in completely elimination the growth of C. albicans compared to dettol alone (92.7% inhibition). From this study it was concluded that the lethal dose of dettol could be reduced to C. albicans by 99% of the common practice dose that is used. The germ tube formation of C. albicans was used to detect the effect of different concentrations of dettol, Cu and dettol with Cu. The results showed that the highest stress was found at treatment with dettol and Cu with highest number of germ tube formation 500±3.94 germ tube in 100 ml culture.

Keywords: Candida albicans; Dettol; Chloroxylenol; Copper.

Dept. of Chemistry

40. Graphene-Based Materials for Flexible Supercapacitors

Yuanlong Shao, Maher F. El-Kady, Lisa J. Wang,a Qinghong Zhang, Yaogang Li, Hongzhi Wang, Mir F. Mousaviae and Richard B. Kaner

The demand for flexible/wearable electronic devices that have aesthetic appeal and multi-functionality has stimulated the rapid development of flexible supercapacitors with enhanced electrochemical performance and mechanical flexibility. After a brief introduction to flexible supercapacitors, we summarize current progress made with graphene-based electrodes. Two recently proposed prototypes for flexible supercapacitors, known as micro-supercapacitors and fiber-type supercapacitors, are then discussed. We also present our perspective on the development of graphene-based electrodes for flexible supercapacitors.

Keywords: Graphene; Supercapacitors; Flexible energy storage.

41. Solid-State Activation of Li_2o_2 Oxidation Kinetics and Implications for Li-O$_2$ Batteries

Koffi P. C. Yao, Marcel Risch, Sayed Youssef Sayed Yueh-Lin Lee, Jonathon R. Harding, Alexis Grimaud, Nir Pour, Zhichuan Xu, Jigang Zhou, Azzam Mansour, Fanny Barde and Yang Shao-Horn

As one of the most theoretically promising next-generation chemistries, Li-O_2 batteries are the subject of intense research to address their stability, cycling, and efficiency issues.

The recharge kinetics of Li-O_2 are especially sluggish, prompting the use of metal nanoparticles as reaction promoters. In this work, we probe the underlying pathway of kinetics enhancement by transition metal and oxide particles using a combination of electrochemistry, X-ray absorption spectroscopy, and thermochemical analysis in carbon-free and carbon-containing electrodes.

We highlight the high activity of the group VI transition metals Mo and Cr, which are comparable to noble metal Ru and coincide with XAS measured changes in surface oxidation state matched to the formation of Li2MoO4 and Li_2CrO_4. A strong correlation between conversion enthalpies of Li_2O_2 with the promoter surface (Li_2O_2 + MaOb +/- O_2 [rightward arrow] LixMyOz) and electrochemical activity is found that unifies the behaviour of solid-state promoters.

In the absence of soluble species on charge and the decomposition of Li2O2 proceeding through solid solution, enhancement of Li_2O_2 oxidation is mediated by chemical conversion of Li_2O_2 with slow oxidation kinetics to a lithium metal oxide. Our mechanistic findings provide new insights into the selection and/or employment of electrode chemistry in Li-O_2 batteries.

Keywords: Batteries; Li-air; Li-oxygen; Electrocatalysis.

42. Flash Converted Graphene for Ultra-high Power Supercapacitors

Lisa J. Wang, Maher F. El-Kady, Sergey Dubin, Jee Youn Hwang, Yuanlong Shao, Kristofer Marsh, Brian McVerry, Matthew D. Kowal, Mir F. Mousavi and Richard B. Kaner

Supercapacitors are known for their rapid energy charge–discharge properties, often ten to a hundred times faster than batteries. However, there is still a demand for supercapacitors with even faster charge–discharge characteristics to fulfill the requirements of emerging technologies.

The power and rate capabilities of supercapacitors are highly dependent on the morphology of their electrode materials. An electrically conductive 3D porous structure possessing a high surface area for ions to access is ideal. Using a flash of light, a method to produce highly interconnected 3D graphene architectures with high surface area and good conductivity is developed.

The flash converted graphene is synthesized by reducing freeze-dried graphene oxide using an ordinary camera flash as a photothermal source. The flash converted graphene is used in coin cell supercapacitors to investigate its electrode materials properties.

The electrodes are fabricated using either a precoating flash conversion or a postcoating flash conversion of graphene oxide. Both techniques produce supercapacitors possessing ultra-high power (5–7 $\times$ 105 W kg^{-1}). Furthermore, optimized supercapacitors retain >50% of their capacitance when operated at an ultrahigh current density up to 220 A g^{-1}.

Keywords: Graphene; High power supercapacitor; Photothermal.

43. High Selectivity of Supported Ru Catalysts in the Selective Co Methanation-Water Makes the Difference

Ali M. Abdel-Mageed, Stephan Eckle and R. Jürgen Behm

The selectivity for CO methanation is a decisive aspect for the practical application of the methanation reaction for the removal of CO from CO^{2-} rich H2 fuel gases produced via hydrocarbon reforming. We show that increasing the water content in the feed gas, up to technically relevant levels of 30%, significantly increases the selectivity of supported Ru catalysts compared with operation in (almost) dry gas, while in operando EXAFS measurements reveal a gradual decrease in the Ru particle size with increasing amounts of water in the gas feed. Consequences of these findings and related IR spectroscopic data for the mechanistic understanding and practical applications are outlined.

Keywords: Selective CO methantion; Water, RU nanoparticles.

44. Direct Preparation and Processing of Graphene/Ruo2 Nanocomposite Electrodes for High-Performance Capacitive Energy Storage

Jee Y. Hwang, Maher F.El-Kady, YueWang, LisaWang,Yuanlong Shao, Kristofer Marsh, Jang M. Ko and Richard B. Kaner

Carbon materials are widely used in supercapacitors because of their high surface area, controlled porosity and ease of processing into electrodes. The combination of carbon with metal oxides results in hybrid electrodes with higher specific capacitance than pure carbon electrodes, which has so far limited the energy density of supercapacitors currently available commercially. However, the preparation and processing of carbon/metal oxide electrodes into supercapacitors of different structures and configurations, especially for miniaturized electronics, has been challenging. Here, we demonstrate a simple one-step process for the synthesis and processing of laser-scribed graphene/RuO2 nanocomposites into electrodes that exhibit ultrahigh energy and power densities. Hydrous RuO_2 nanoparticles were successfully anchored to graphene surfaces through a redox reaction of the precursors, graphene oxide, and $RuCl_3$ using a consumer grade LightScribe DVD burner with a 788 nm laser. This binder-free, metal current collector-free graphene/RuO_2 film was then used directly as a hybrid electrochemical capacitor electrode, demonstrating much-improved cycling stability and rate-capability with a specific capacitance up to 1139 F g-1. We employed these hybrid electrodes for building aqueous-based symmetric and asymmetric cells that can deliver energy densities up to 55.3 Wh kg-1, placing them among the best performing hybrid electrochemical capacitors. Furthermore, this technique was used for the direct writing of interdigitated hybrid micro-supercapacitors in a single step for the first time, with great potential for miniaturized electronics. This simple approach provides a general strategy for making a wide range of composite materials for a variety of applications.

Keywords: Graphene; Laser; Rutheniumoxide; Hybrid capacitor; Asymmetric superca- pacitor; Micro-supercapacitor.

45. Engineering Three-Dimensional Hybrid Supercapacitors and Microsupercapacitors for High-Performance Integrated Energy Storage

Maher F. El-Kady, Melanie Ihns, Mengping Li, Jee Youn Hwang, Mir F. Mousavi, Lindsay Chaney, Andrew T. Lech and Richard B. Kanera

Supercapacitors now play an important role in the progress of hybrid and electric vehicles, consumer electronics, and military and space applications. There is a growing demand in developing hybrid supercapacitor systems to overcome the energy density limitations of the current generation of carbon-based supercapacitors. Here, we demonstrate 3D high-performance hybrid supercapacitors and microsupercapacitors based on graphene and MnO2 by rationally designing the electrode microstructure and combining active materials with electrolytes that operate at high voltages. This results in hybrid electrodes with ultrahigh volumetric capacitance of over 1,100 F/cm3. This corresponds to a specific capacitance of the constituent MnO2 of 1,145 F/g, which is close to the theoretical value of 1,380 F/g. The energy density of the full device varies between 22 and 42 Wh/l depending on the device configuration, which is superior to those of commercially available double-layer supercapacitors, pseudocapacitors, lithium-ion capacitors, and hybrid supercapacitors tested under the same conditions and is comparable to that of lead acid batteries. These hybrid supercapacitors use aqueous electrolytes and are assembled in air without the need for expensive "dry rooms" required for building today's supercapacitors. Furthermore, we demonstrate a simple technique for the fabrication of supercapacitor arrays for high-voltage applications. These arrays can be integrated with solar cells for efficient energy harvesting and storage systems.

Keywords: Supercapacitor; Microsupercapacitor; Graphene; Metal oxide.

46. Selective CO Methanation on Ru/TiO$_2$ Catalysts: Role and Influence of Metal–Support Interactions

Ali M. Abdel-Mageed, D. Widmann, S. E. Olesen, I. Chorkendorff, J. Biskupek and R. J. Behm

Aiming at a detailed understanding of the role of metal–support interactions in the selective methanation of CO in CO^{2-} rich reformate gases, we have investigated the catalytic performance of a set of Ru/TiO$_2$ catalysts with comparable Ru loading, Ru particle size, and TiO$_2$ phase composition but very different surface areas (ranging from 20 to 235 m_2 g^{-1}) in this reaction. The activity for CO methanation, under steady-state conditions, was found to strongly depend on the TiO$_2$ support surface area, increasing first with increasing surface area up to a maximum activity for the Ru/TiO$_2$ catalyst with a surface area of 121 m2 g^{-1} and then decreasing for an even higher surface area; however, the selectivity is mainly determined by the Ru particle size, which slightly decreases with increasing support surface area. This goes along with an increase in selectivity for CO methanation, in agreement with a model proposed previously for nonreducible supports. In situ infrared measurements further revealed that also the adsorption properties for these catalysts, as evidenced by the

CO adsorption strength, change significantly with increasing catalyst surface area and that strong metal–support interactions cause a partial overgrowth of the Ru nanoparticles for the highest surface area catalyst.

The interplay between catalyst surface area and reaction characteristics and the important role of metal–support interactions in the reaction, in addition to particle size effects, will be elucidated and discussed.

Keywords: Selective CO methanation; Surface area; Selectivity; Particle size effects; Metal-support interactions; Ru/TiO$_2$.

47. Highly Ordered Mesoporous CucO$_2$O$_4$ Nanowires, A Promising Solution for High-Performance Supercapacitors

Afshin Pendashteh, Seyyed Ebrahim Moosavifard, Mohammad S. Rahmanifar, Yue Wang, aher F. El-Kady, Richard B. Kaner and Mir F. Mousavi

The search for faster, safer, and more efficient energy storage systems continues to inspire researchers to develop new energy storage materials with ultrahigh performance. Mesoporous nanostructures are interesting for supercapacitors because of their high surface area, controlled porosity, and large number of active sites, which promise the utilization of the full capacitance of active materials. Herein, highly ordered mesoporous CuCO$_2$O$_4$ nanowires have been synthesized by nanocasting from a silica SBA-15 template. These nanowires exhibit superior pseudocapacitance of 1210 F g^{-1} in the initial cycles. Electroactivation of the electrode in the subsequent 250 cycles causes a significant increase in capacitance to 3080 F g^{-1}.

An asymmetric supercapacitor composed of mesoporous CuCo$_2$O$_4$ nanowires for the positive electrode and activated carbon for the negative electrode demonstrates an ultrahigh energy density of 42.8 Wh kg^{-1} with a power density of 15 kW kg^{-1} plus excellent cycle life. We also show that two asymmetric devices in series can efficiently power 5 mm diameter blue, green, and red LED indicators for 60 min. This work could lead to a new generation of hybrid supercapacitors to bridge the energy gap between chemical batteries and double layer supercapacitors.

Keywords: Mesoporous CucO$_2$o$_4$; Nanowires; Supercapacitors.

48. Characterization and Biodegradation Behavior of Bio-Based Poly (Lactic Acid) and Soy Protein Blends For Sustainable Horticultural Applications Horticultural Applications

Shengzhe Yang, Samy A. Madbouly, James A. Schrader, Gowrishankar Srinivasan, David Grewell, Kenneth G. McCabe, Michael R. Kesslere and William R. Graves

Adipic anhydride-plasticized soy protein (SP.A) was blended with poly(lactic acid) (PLA) at two concentrations (50/50 and 33/67) and was evaluated for use as a sustainable replacement for petroleum plastic in horticulture crop containers.

Following the discovery that SP.A/PLA blends provide additional functions above that of petroleum plastic for this application, the present study evaluates the biodegradation behavior of these materials in soil and describes the substantial improvements in

sustainability that result from the additional functions (intrinsic fertilizer and root improvement of plants) and the end-of-life option of biodegradation.

After being buried in soil for designated time intervals, the residual degraded samples were analyzed to determine morphological and thermal properties at sequential stages of biodegradation. Samples were characterized by scanning electron microscopy (SEM), dynamic mechanical analysis (DMA), differential scanning calorimetry (DSC), and thermogravimetric analysis (TGA).

The results indicated that there was a compatible system between SP.A and PLA in the melt. Incorporation of SP.A accelerated the biodegradation rate of this binary blend significantly compared with pure PLA.

Prior to the degradation process, both the glass transition temperatures and melting temperatures of the blends containing SP.A decreased as the concentration of the soy protein increased. With increasing degradation time of the blended samples in soil, the glass transition temperatures increased in the early stages of biodegradation then decreased, a trend associated with the decrease in the molecular weight of the blends as a result of biodegradation.

In addition, the thermal stability of blends increased gradually with increasing degradation time, suggesting faster biodegradation loss of the soy component of the SP.A/PLA blends. These results support the use of soy-based polymer blends for horticulture crop containers and provide data for evaluating their use as sustainable materials for other potential applications.
Keywords: Soy protein; Morphology; Scanning electron microscopy; Thermal analysis; Biodegradation.

49. Improved Performance of Ru/γ-Al$_2$O$_3$ Catalysts in the Selective Methanation of Co in Co$_2$-Rich Reformate Gases Upon Transient Exposure to Water-Containing Reaction Gas

Ali M. Abdel-Mageed, Daniel Widmann, Stephan Eckle] and R. Jìrgen Behm

To better understand the role of water in the selective methanation of CO in CO$_2$-rich reformate gases on Ru/Al$_2$O$_3$ catalysts, the influence of exposing these catalysts to H$_2$O-rich reformate gases on their reaction characteristics in transient experiments was investigated by employing kinetic and in situ spectroscopic measurements as well as ex situ catalyst characterization. Transient exposure of the ruthenium catalyst to wet reaction gas (5 or 15% H$_2$O) results in significantly enhanced activity and selectivity for CO methanation in subsequent reactions in dry reformate compared with activation and reaction in dry reformate directly.

Operando X-ray absorption spectroscopy results reveal that this is in accordance with a significant decrease in ruthenium particle size, which is stable during subsequent reaction in dry reformate. The implications of these data and additional results from in situ IR spectroscopy on the role and influence of H$_2$O on the reaction, also in technical applications, are discussed.
Keywords: Methanation, Nanoparticles ruthenium; Supported catalysts; Surfac ea nalysis.

50. Unexpected Tackifiers from Isosorbide

Michael D. Zenner, Samy A. Madbouly, Jason S. Chenand and Michael R. Kessler

Molecularly well-defined tackifiers with up to 100% bio-content were prepared from isosorbide and various cyclic anhydrides. These tackifiers are tacky over a broad temperature range and exhibit high maximum tack (ca. 2000 kPa). Structural modifications shift the temperature at which maximum tack is observed and change the viscosity of the tackifiers.
Keywords: Kackifiers; Structural modifications; Rheology; Viscosity; Gel.

51. Free-Standing Composite Hydrogel Films for Superior Volumetric Capacitance

Mahmoud Moussa, Zhiheng Zhao, Maher F. El-Kady, Huakun Liu, Andrew Michelmore, Nobuyuki Kawashima, Peter Majewskia and Jun Ma

High volumetric capacitance is vital for the development of wearable and portable energy storage devices. We herein introduce a novel simple route for the fabrication of a highly porous, binder-free and free-standing polyaniline/reduced graphene oxide composite hydrogel (PANi/graphene hydrogel) as an electrode with a packing density of 1.02 g cm-3. PANi played critical roles in gelation, which include reduction, crosslinking, creation of pseudocapacitance and as a spacer preventing graphene sheets from stacking. The composite hydrogel film delivered a volumetric capacitance of 225.42 F cm^{-3} with a two-electrode supercapacitor configuration, which was enhanced to 592.96 F cm^{-3} in a redox-active electrolyte containing hydroquinone. This new strategy will open a new area for using conducting polymer derivatives in the development of flexible graphene electrodes towards many applications such as batteries, sensors and catalysis.
Keywords: Composite; Hydrogel; Free-standing films; Capacitance; Supercapacitor.

52. Microwave Irradiated Nickel Nanoparticles on Vulcan Xc-72R Carbon Black for Methanol Oxidation Reaction in Koh Solution

M. Abdel Hameed and Rabab M. El-Sherif

Ni/C electrocatalysts were prepared by chemical deposition of nickel nanoparticles on Vulcan XC-72R carbon black using microwave irradiation technique. The time of microwave irradiation during the reduction step and nickel weight percentage were varied. This was found to affect the morphology of formed Ni/C powder as shown by TEM analysis. Increasing nickel weight percentage results in the formation of more aggregated deposits. The electrocatalytic activity of different Ni/C samples towards methanol oxidation reaction in KOH solution was studied by applying cyclic voltammetry, chronoamperometry and

electrochemical impedance spectroscopic techniques. Ni/C electrocatalyst containing 30 wt.% Ni [Ni/C-30] shows 5.2 times higher electrocatalytic activity than that with 10 wt.% Ni [Ni/C-10]. Heating Ni/C powder into microwave oven using the pulse mode of 30 s on/10 s off forms the most stable electrocatalyst for prolonged oxidation reaction. Electrochemical impedance measurements show that Ni/C-30 electrocatalyst has the lowest impedance value of 0.022 kΩ cm^2, while the highest one is for Ni/C-10 [0.331 kΩ cm^2] in (0.4 M methanol + 0.5 M KOH) solution at 500 mV. It confirms that Ni/C-30 has the highest electrocatalytic activity towards methanol oxidation reaction.

Keywords: Methanol; Nickel-based electrocatalyst; Microwave irradiation; KOH; Fuel cells.

53. A Novel Fabrication of A Polymeric Ionic Liquid Hybrid Film Modified Electrode and Its Successful Application to the Electrogeneration of A Superoxide Anion in Aqueous Media

Dilani Nilushika, Mohamed I. Awad, Mahmoud M. Saleh, Takeyoshi Okajima Lanqun Maoc and Takeo Ohsaka

Chemical Communications, 51: 3343-3346 (2015) IF: 6.834

A novel polymeric ionic liquid hybrid film-modified electrode, in which the electrode surface is coated with a hydrophobic hybrid material composed of an ionene polymer with quaternary ammonium sites in its polymeric backbone and ionic liquids, was fabricated by electropolymerization of N,N-dimethylaniline in a hydrophobic ionic liquid, which can be applied for the electrogeneration of a superoxide anion via one-electron reduction of O2 in aqueous media.

Keywords: Polymer; Ionic liquid; Superoxide; Orr.

54. Designing 3D Highly Ordered Nanoporous CuO Electrodes for High-Performance Asymmetric Supercapacitors

Seyyed E. Moosavifard, Maher F. El-Kady, Mohammad S. Rahmanifar, Richard B. Kaner and Mir F. Mousavi

Acs Applied Materials and Interfaces, 7: 4851-4860 (2015) IF: 6.723

The increasing demand for energy has triggered tremendous research efforts for the development of lightweight and durable energy storage devices. Herein, we report a simple, yet effective, strategy for high-performance supercapacitors by building three-dimensional pseudocapacitive CuO frameworks with highly ordered and interconnected bimodal nanopores, nanosized walls (4 nm) and large specific surface area of 149 m2 g–1. This interesting electrode structure plays a key role in providing facilitated ion transport, short ion and electron diffusion pathways and more active sites for electrochemical reactions. This electrode demonstrates excellent electrochemical performance with a specific capacitance of 431 F g–1 (1.51 F cm–2) at 3.5 mA cm–2 and retains over 70% of this capacitance when operated at an ultrafast rate of 70 mA cm–2. When this highly ordered CuO electrode is assembled in an asymmetric cell with an activated carbon electrode, the as-fabricated device demonstrates remarkable performance with an energy density of 19.7 W h kg–1, power density of 7 kW kg–1, and excellent cycle life. This work presents a new platform for high-performance asymmetric

supercapacitors for the next generation of portable electronics and electric vehicles.

Keywords: 3D Highly ordered electrodes; Nanoporous; Copper oxide; Asymmetric supercapacitor.

55. Biobased Polyurethanes Prepared from Different Vegetable Oils

Chaoqun Zhang, Samy A. Madbouly and Michael R. Kessle

Acs Applied Materials and Interfaces, 7: 1226-1233 (2015) IF: 6.723

In this study, a series of biobased polyols were prepared from olive, canola, grape seed, linseed, and castor oil using a novel, solvent/catalyst-free synthetic method. The biobased triglyceride oils were first oxidized into epoxidized vegetable oils with formic acid and hydrogen peroxide, followed by ring-opening reaction with castor oil fatty acid. The molecular structures of the polyols and the resulting polyurethane were characterized. The effects of crosslinking density and the structures of polyols on the thermal, mechanical, and shape memory properties of the polyurethanes were also investigated.

Keywords: Vegetable oil; Polyol; Polyurethane; Shape memory.

56. Synthesis and Application of a Molecularly Imprinted Polymer for the Voltammetric Determination of Famciclovir

Nesrine Abdel rehim El Gohary, Adel Madbouly, Rasha Mohamed El Nashar and Boris Mizaikoff

Biosensors Andbioelectronics, 65: 108-114 (2015) IF: 6.409

A molecularly imprinted polymer(MIP) was synthesized and applied as additive within a carbon paste electrode for the cyclic voltammetric determination of famciclovir(FCV). Complementary computational studies were performed to study the intermolecular interactions in the pre-polymerization mixture. Derived from the computational studies,four MIP ratios were synthesized and their performance was evaluated using equilibrium rebinding assays.The MIP with the highest binding capacity was selected. A linear response was obtained in the range of $2.5 \times 10^{-6} 1.0 \times 10^{-3}$ M with a limit of detection at 7.5×10^{-7} M. Finally,the developed MIP–voltammetry system was successfully applied for the determination of FCV in pure solutions and pharmaceutical preparations.

Keywords: Molecular imprintedpolymers MIPs Famciclovir Computational Studies Carbon Pasteelectrode and Cyclicvoltammetry.

57. On the Synthesis of Nickel Oxide Nanoparticles by Solegel Technique and its Electrocatalytic Oxidation of Glucose

Amgad S. Danial, M.M., S.A. Salih and M.I. Awad

Journal of Power Sources, 293: 101-108 (2015) IF: 6.217

Nickel oxide nanoparticles (nano-NiOx) of peculiar shape are prepared by sol–gel technique and its electrocatalytic activity is evaluated at different conditions. The thus prepared nanoparticles are annealed at three different temperatures, i.e., 200, 400 and 600

°C and anchored on glassy carbon (GC) electrode. Nano-NiOx modified GG (nano-NiOx/GC) electrodes are subjected to surface analysis techniques such as field emission scanning electron microscopy (FE-SEM) high resolution transmission electron micrograph (TEM) and X-ray diffraction (XRD). Electrochemical characterizations are performed using cyclic voltammetry and chronoamperometric techniques. The effects of annealing temperature on the morphological structure, surface concentration and subsequently on the electrochemical properties of nano-NiOx/GC are examined. Experimental results indicate that the grain size and electrochemical characteristics of the nano-NiOx/GC are significantly affected by the annealing temperature. The electrocatalytic oxidation of glucose at nano-NiOx/GC electrode is significantly enhanced especially with nano-NiOx annealed at 200 °C compared to those annealed at 400 and 600 °C. Nano-NiOx is believed to play a crucial role as a catalytic mediator to facilitate the charge transfer during the oxidation of glucose.

Keywords: Metal oxide; Nanoscale nickel oxide; Sol–gel technique; Electrocatalysis; Glucose.

58. Fuel Blends: Enhanced Electro-Oxidation of Formic Acid in its Blend With Methanol at Platinum Nanoparticles Modified Glassy Carbon Electrodes

Mohamed S. El-Deab, Gumaa A. El-Nagar, Ahmad M. Mohammad and Bahgat E. El-Anadouli

The current study addresses, for the first time, the enhanced direct electro-oxidation of formic acid (FA) at platinum-nanoparticles modified glassy carbon (nano-Pt/GC) electrode in the presence of methanol (MeOH) as a blending fuel. This enhancement is probed by: (i) the increase of the direct oxidation current of FA to CO2 (View the MathML sourceIpd, dehydrogenation pathway), (ii) suppressing the dehydration pathway (View the MathML sourceIpind, producing the poisoning intermediate CO) and (iii) a favorable negative shift of the onset potential of View the MathML source I^p_d with increasing the mole fraction of MeOH in the blend. Furthermore, the charge of the direct FA oxidation in 0.3 M FA + 0.3 M MeOH blend is by 14 and 21times higher than that observed for 0.3 M FA and 0.3 M MeOH, respectively. MeOH is believed to adsorb at the Pt surface sites and thus disfavor the "non-faradaic" dissociation of FA (which produces the poisoning CO intermediate), i.e., MeOH induces a high CO tolerance of the Pt catalyst. The enhanced oxidation activity indicates that FA/MeOH blend is a promising fuel system.

Keywords: Fuel utilization; Catalytic enhancement; Platinum nanoparticles; Electrocatalysis; Carbon monoxide tolerance.

59. Reversibility of Ferri-/Ferrocyanide Redox During Operando Soft X-Ray Spectroscopy

Marcel Risch, Kelsey A. Stoerzinger, Tom Z. Regier, Derek Peak, Sayed Youssef Sayed and Yang Shao-Horn

The ferri-/ferrocyanide redox couple is ubiquitous in many fields of physical chemistry. We studied its photochemical response to intense synchrotron radiation by in situ X-ray absorption spectroscopy (XAS). For photon flux densities equal to and above 2×10^{11} s^{-1} mm^{-2}, precipitation of ferric (hydr)oxide from both ferricyanide and ferrocyanide solutions was clearly detectable, despite flowing fast enough to replace the solution in the flow cell every 0.4 s (flow rate 1.5 mL/min). During cyclic voltammetry, precipitation of ferric (hydr)oxide was promoted at reducing voltages and observed below 10^{11} s^{-1} mm^{-2}. This was accompanied by inhibition of the ferri-/ferrocyanide redox, which we probed by time-resolved operando XAS. Our study highlights the importance of considering both electrochemical and spectroscopic conditions when designing in situ experiments.

Keywords: Ferricyanide and ferrocyanide; Cyclic voltammetry; In Situ X-ray absorption spectroscopy (XAS).

60. Preparation and Application of Molecularly Imprinted Polymer for Isolation of Chicoric Acid from Chicorium Intybus L. Medicinal Plant

Engy M. Saad, Adel Madbouly, Nahla Ayoub and Rasha Mohamed El Nashar

Molecularly imprinted polymer (MIP) was synthesized and applied for the extraction of chicoric acid from Chicory herb (Chicorium intybus L.). A computational study was developed to find a suitable template to functional monomer molar ratio for MIP preparations. The molar ratio was chosen based on the comparison of the binding energy of the complexes between the template and functional monomers. Based on the computational results, eight different polymers were prepared using chicoric acid as the template. The MIPs were synthesized in a non-covalent approach via thermal free-radical polymerization, using two different polymerization methods, bulk and suspension. Batch rebinding experiments were performed to evaluate the binding properties of the imprinted polymers. The best results were obtained with a MIP prepared using bulk polymerization with 4-vinylpyridine (4-VP) as the functional monomer and ethylene glycol dimethacrylate (EGDMA) as the crosslinker with a molar ratio of 1:4:20. The best MIP showed selective binding ability toward chicoric acid in the presence of the template's structural analogues, caffeic acid, caftaric acid and chlorogenic acid.

Keywords: Molecularly Imprinted Polymer Computational Study Extraction Phenolic Acids Chicoric Acid.

61. Synergistic Enhancement of the Electro-Oxidation of Methanol at Tailor-Designed Nanoparticle-Based CoOx/MnOx/Pt Ternary Catalysts

Mohamed S. El-Deab, Ghada H. El-Nowihy and Ahmad M. Mohammad

The current study addresses the enhanced electroctrocatalytic activity of a nanoparticle-based ternary catalyst composed of Pt (nano-Pt), manganese oxide (nano-MnOx), and cobalt oxide (nano-CoOx) (all were assembled on a glassy carbon (GC) substrate) towards the direct methanol electro-oxidation reaction (MOR) in an alkaline medium. The electrocatalytic activity of the modified electrodes towards MOR depends on the loading level

of nano-Pt, nano-MnOx, and nano-CoOx onto the GC electrode as well as the order of deposition of each component. Interestingly, the CoOx/MnOx/Pt/GC electrode (with nano-Pt firstly deposited onto the GC surface followed by nano-MnOx then nano-CoOx) shows the highest catalytic activity and stability towards MOR for a prolonged time of continuous electrolysis. This is revealed from the large increase (seven times) in the peak current of MOR at this electrode compared with that obtained at Pt/GC electrode. The influence of operating pH on the catalytic activity of the proposed catalyst is investigated. Several techniques including cyclic voltammetry, field-emission scanning electron microscopy and energy dispersive X-ray spectroscopy and X-ray diffraction are used to address the catalytic activity of the catalyst and to reveal its surface morphology and composition.
Keywords: Methanol oxidation; Electrocatalysis; PEM fuel cells; Platinum nanoparticles; Transition metal oxides.

62. Promoting Effect of Hydrocarbon Impurities on the Electro-Oxidation of Formic Acid at Pt Nanoparticles Modified GC Electrodes

Gumaa A. El-Nagar, Mohamed S. El-Deab, Ahmad M. Mohammad and Bahgat E. El-Anadouli

This paper addresses a systematic study of the unexpected enhancement of some hydrocarbon impurities towards formic acid oxidation (FAO) at Pt nanoparticles modified GC electrode, for the first time. That is, the oxidation current peak observed at ca. 0.25 V (assigned for the direct FAO to CO_2, I_p^d) increases in the presence of a minute amount (~ppm range) of Acetonitrile > Acrylonitrile > Acetamide > Pyridine ~ vinyl acetate > Pyrrole > Methyl Acrylate > toluene with a concurrent decrease of the second oxidation peak current (assigned for the indirect oxidation of FA, I_p^{ind}) observed at ca. 0.65 V. Moreover, the onset potential of FAO is favored by shifted towards the negative potentials together with a noticeable increase of the stability of the current transients measured during FAO in the presence of impurities. The enhanced activity is believed to originate from interrupting the contiguity of Pt sites by the pre-adsorption of the respective impurity at nano-Pt surface thus impedes/weakens the adsorption of the poisoning CO.
Keywords: Hydrocarbon impurities; CO tolerance; Electrocatalysis; Nanoparticles; DFAFCs.

63. Antimicrobial Ruthenium Complex Coating on the Surface of Titanium Alloy. High Efficiency Anticorrosion Protection of Ruthenium Complex

Nadia E.A. El-Gamel and Amany M. Fekry

A ruthenium complex was prepared and structurally characterized using various techniques. Antibacterial and antifungal activities of ruthenium complex were evaluated. High significant antimicrobial activity against Escherichia coli, Staphylococcus aureus and Candida albicans was recorded. Minor cytotoxicity records were reported at the highest concentration level using MTT assay. The influence of Cu(II), Cr(III), Fe(III) and Ru(III) metal ions of salen Schiff base on the corrosion resistance of Ti-alloy in 0.5 M HCl was studied. In vitro corrosion resistance was

investigated using electrochemical impedance spectroscopy (EIS) measurements and confirmed by surface examination via scanning electron microscope (SEM) technique. Both impedance and phase angle maximum ($^\theta$max) values were at maximum in the case of the ruthenium complex with promising antibacterial and antifungal activities. The surface film created by the ruthenium complex was highly resistant against attack or deterioration by bacteria. The EIS study showed high impedance values for the ruthenium complex with increasing exposure time up to 8 days. SEM images showed uniform distribution and adsorption of Ru(III) ions on Ti-alloy surface. The ruthenium complex, as a model of organic–inorganic hybrid complex, offered new prospects with desired properties in industrial and medical applications.
Keywords: Ruthenium complex; Electrochemical impedance spectroscopy; Cytotoxicity; Scanning electron microscope; Titanium alloy.

64. Interaction of Polar and Nonpolar Organic Pollutants with Soil Organic Matter: Sorption Experiments and Molecular Dynamics Simulation

Ashour A. Ahmed, Sören Thiele-Bruhn, Saadullah G. Aziz, Rifaat H. Hilal, Shaaban A. Elroby Abdulrahman O. Al-Youbi, Peter Leinweber and Oliver Kühn

The fate of organic pollutants in the environment is influenced by several factors including the type and strength of their interactions with soil components especially SOM. However, a molecular level answer to the question "How organic pollutants interact with SOM" is still lacking. In order to explore mechanisms of this interaction, we have developed a new SOM model and carried out molecular dynamics (MD) simulations in parallel with sorption experiments. The new SOM model comprises free SOM functional groups (carboxylic acid and naphthalene) as well as SOM cavities (with two different sizes), simulating the soil voids, containing the same SOM functional groups. To examine the effect of the hydrophobicity on the interaction, the organic pollutants hexachlorobenzene (HCB, non-polar) and sulfanilamide (SAA, polar) were considered. The experimental and theoretical investigations explored four major points regarding sorption of SAA and HCB on soil, yielding the following results. 1—The interaction depends on the SOM chemical composition more than the SOM content. 2—The interaction causes a site-specific adsorption on the soil surfaces. 3—Sorption hysteresis occurs, which can be explained by inclusion of these pollutants inside soil voids. 4—The hydrophobic HCB is adsorbed on soil stronger than the hydrophilic SAA. Moreover, the theoretical results showed that HCB forms stable complexes with all SOM models in the aqueous solution, while most of SAA–SOM complexes are accompanied by dissociation into SAA and the free SOM models. The SOM-cavity modeling had a significant effect on binding of organic pollutants to SOM. Both HCB and SAA bind to the SOM models in the order of models with a small cavity > a large cavity > no cavity. Although HCB binds to all SOM models stronger than SAA, the latter is more affected by the presence of the cavity. Finally, HCB and SAA bind to the hydrophobic functional group (naphthalene) stronger than to the hydrophilic one (carboxylic acid) for all SOM models containing a cavity. For

models without a cavity, SAA binds to carboxylic acid stronger than to naphthalene.

Keywords: Organic pollutants; Sulfanilamide (SAA); Hexachlorobenzene (HCB); Soil organic matter (SOM); Sorption isotherms; Molecular modeling; Molecular dynamics simulation.

65. Fractional Determination of Peracetic Acid and Hydrogen Peroxide Atdeposited Gold Enriched in the Au(1 1 1) Domain

Mohamed I. Awad and Takeo Ohsaka

Gold decorated glassy carbon electrodes (Au/GC) are examined for the simultaneous electroanalysis ofperacetic acid (PAA) and hydrogen peroxide (H_2O_2) in their coexistence and the results are comparedwith those obtained at the polycrystalline gold (poly-Au) and single crystalline gold electrodes. Gold iselectrodeposited from 1 mM Na[AuCl$_4$] solutions in the presence of either Cl$^-$(Au$_{Cl}$/GC) or citric acid(Au$_{cit}$/GC) and in their absence (Au$_{non}$/GC). The two well-defined and separated peaks for the reductionof PAA and H_2O_2were obtained in acetate buffer solutions (pH 4.7). Among the electrodes studied, i.e.,poly-Au, Au$_{non}$/GC, Au$_{cit}$/GC and Au$_{Cl}$/GC electrodes, the largest peak current and the most positive peakpotential for the PAA reduction were obtained at the Au$_{cit}$/GC electrode. The reason behind the high cat-alytic activity obtained at the Au$_{cit}$/GC electrode is attributed to the fact that this electrode is enrichedin the Au(1 1 1) domain, based on the PAA and H_2O_2electroreduction at the single crystalline gold elec-trodes where the highest electrocatalytic activity toward PAA reduction was obtained at Au(1 1 1) singlecrystalline gold electrode. A significantly large peak separation in the PAA and H2O2reduction at theAu$_{cit}$/GC electrode enabled the simultaneous electroanalysis of PAA and H_2O_2in the presence of highconcentration of H_2O_2(ca. 0.05 M) in their aerated solutions.

Keywords: Single crystalline gold electrodes; Electrodeposition; Electroanalysis; Hydrogen peroxide; Peracetic acid.

66. Potentiometric Determination of La (III) in Polluted Water Samplesusing Modified Screen-Printed Electrode by Self-assembled Mercaptocompound on Silver Nanoparticles

Tamer Awad Alia and Gehad G. Mohamed

A mercapto compound, 3-amino-5-mercapto-1,2,4-triazole (AMT), was self-assembled on silvernanoparticles and used as a modifier to construct a modified screen-printed electrode. The self-assembledionophore exhibits a high selectivity for lanthanum ion (La(III)), in which the sulfur and nitrogenatoms in their structure play a role as the effective coordination donor sites for the lanthanum ion.The proposed potentiometric method was based on the fabrication of modified sliver nanoparticles-screen-printed electrode (SNPs-MSPE) and modified screen-printed electrode with AMT (MSPE). Thesensors have characteristic performance with working concentration range of 1.0×10-6–1.0×10-2and 1.0×10-8–1.0×10-1mol L-1and a Nernstian slope of

17.5 ± 0.1 and 20.2 ± 0.1 mV decade-1of lan-thanum ion using MSPE and SNPs-MSPE, respectively. The detection limit was found to be 1.9×10-7and 1.5×10-9mol L-1and potential response was pH independent across the range of 3.5–8.5 and3.0–9.5 for MSPE and SNPs-MSPE, respectively. The application of the prepared sensors has been demon-strated for the determination of lanthanum ions in spiked real water samples. The results obtained werecompared well with those obtained using inductively coupled plasma atomic absorption spectrometry(ICP-AES).

Keywords: Modified Screen-printed Electrodesilver Nanoparticleslanthanum Ionmercapto Compound.

67. Fabrication of High Power Lini0.5Mn1.5O4 Battery Cathodes by Nanostructuring of Electrode Materials

Mohammad A. Kiani, Mohammad S. Rahmanifar, Maher F. El-Kady, Richard B. Kaner and Mir F. Mousavi

Using nanoparticles, instead of microparticles, as active electrode materials in lithium ion batteries could provide a solution to slow charging rates due to long ion diffusion pathways in conventional bulk materials. In this work, we present a new strategy for the synthesis of high purity lithium nickel manganese oxide (LiNi0.5Mn1.5O4) nanoparticles as a high-voltage cathode. A sonochemical reaction is used to synthesize nickel hydroxide and manganese dioxide nanoparticles followed by a solid-state reaction with lithium hydroxide. The product shows a single spinel phase and uniform spherical nano-particles under the appropriate calcination conditions. The LiNi0.5Mn1.5O4 exhibits a high voltage plateau at about 4.7–4.9 V in the charge/discharge process and delivers a discharge capacity of more than 140 mA h g-1 and excellent cycling performance with 99% capacity retention after 70 cycles. The synthesized nano-particles show improved electrochemical performance at high rates. This electrode delivers a power density as high as 26.1 kW kg-1 at a discharge rate of 40 C. This power performance is about one order of magnitude higher than traditional lithium ion batteries. These findings may lead to a new generation of high power lithium ion batteries that can be recharged in minutes instead of hours.

Keywords: LiNion battery; Cathode; Nanomaterials; High power.

68. Graphene Prepared by Gamma Irradiation for Corrosion Protection of Stainless Steel 316 in Chloride Containing Electrolytes

Nada F. Atta, Khaled M. Amin, Hassan A. Abd El-Rehim and Ahmed Galal

In this work we demonstrated the effective use of gamma irradiation for useful chemical conversion. Thus, graphene oxide was reduced to graphene upon exposure to gamma irradiation. The resulting gamma irradiated graphene (GIG) and graphene-covered steel were characterized using UV-Vis, XRD spectroscopies and FE-SEM. Corrosion protection of austenitic stainless steel AISI 316 by GIG and gamma irradiated graphene/chitosan (GIG/CS) composite films in 3.5% NaCl

solution was investigated using potentiodynamic polarization and electrochemical impedance spectroscopy. The protection efficiencies for GIG and GIG/CS were 82.2% and 89%, respectively. GIG/CS films over steel showed higher corrosion activation energies compared to GIG. EIS proved the stability of GIG and GIG/CS coatings after different immersion times in 3.5% NaCl solution. Coated surfaces were free from pits on the scale of magnification as demonstrated from SEM images. The pitting corrosion behavior of uncoated and GIG-coated surfaces was also studied.

Keywords: Graphene; Gamma irradiation; Corrosion protection; Stainless steel 316; Chloride containing electrolytes.

69. Modified Carbon Paste and Polymeric Membrane Electrodes for Determination of Hydroxychloroquine Sulfate in Pharmaceutical Preparations and Human Urine

M. M. Khalil, Y. M. Issa and G. A. El Sayed

Royal Society of Chemistry Advances, 5: 83657-83667 (2015) IF: 3.84

This article describes characteristics, performance and application of hydroxychloroquine (HCQ) polymeric membrane (PMEs) and modified carbon paste (CPEs) electrodes which are based on sodium tetraphenylborate (NaTPB) or ammonium reineckate (Rt) as sensing materials. These electrodes showed Nernstian slopes of 29.1 ± 0.2, 28.5 ± 0.4, 28.0 ± 0.5 and 27.5 ± 0.5 mV decade-1 at 25 ± 0.1 °C, with low detection limits of 7.9×10-6, 8.2×10^{-6}, 6.5×10^{-6} and 5.0×10^{-6} mol L^{-1} HCQ for PME1, PME2, CPE1 and CPE2 electrodes, respectively. The constructed electrodes were found to be precise and usable within the pH range of 2–8, 2–7, 2–8 and 2–7 for the electrodes, respectively. The electrodes manifest advantages of low resistance, very short response time =10 s, and most importantly good selectivity with respect to a number of common inorganic and organic species. Modified carbon paste electrodes showed lower detection limits reaching 5.0×10^{-6}, higher thermal stability (0.0010 mV °C^{-1}) and longer life time (54 days) than those of polymeric membrane electrodes. The electrodes were used for determination of hydroxychloroquine in its pure state, pharmaceutical preparation of hydroxychloroquine and biological fluids such as human urine samples.

Keywords: Modified carbon paste; Polymeric membrane; Electrodes.

70. A Novel Electrochemical Nicotine Sensor Based on Cerium Nanoparticles With Anionic Surfactant

A. M. Fekry, S. M. Azab, M. Shehataa and M. A. Ameer

Rsc Advances, 5: 51662-51671 (2015) IF: 3.84

A novel promising electrochemical nicotine (NIC) sensor was prepared by electrodeposition of Ce-nanoparticles on a carbon paste electrode (CPE). Electrochemical techniques including cyclic voltammetry (CV), electrochemical impedance spectroscopy (EIS), scanning electron microscope (SEM) and Energy Dispersive X-ray Analysis (EDX) techniques, in both aqueous and micellar media were used. NIC measurements were investigated in Britton–Robinson (B–R) buffer solutions with a pH range (2.0–8.0) containing (1.0 mM) sodium dodecyl sulfate (SDS). The linear response range of the sensor was between 4×10^{-6} M and 5×10^{-4} M with a detection limit of 9.43×10-8 M. Good results were achieved for the detection of NIC in real samples and with different brands of commercial cigarettes.

Keywords: Nicotine; Cerium nanoparticles.

71. A Novel Methionine/Palladium Nanoparticle Modified Carbon Paste Electrode for Simultaneous Determination of Three Antiparkinson Drugs

Nahla N. Salama, Shereen M. Azab, Mona A. Mohamed and Amany M. Fekry

Rsc Advances, 5: 14187-14195 (2015) IF: 3.84

A simple, novel and reproducible method for the separation and simultaneous determination of entacapone (EN), levodopa (LD) and carbidopa (CD) based on a methionine/palladium nanoparticle modified carbon paste electrode (Met/Pd/CPE/SDS) prepared via the electrodeposition of palladium on a methionine/carbon paste modified electrode is described. Cyclic voltammetry (CV), differential pulse voltammetry (DPV), chronoamperometry (CA), and electrochemical impedance spectroscopy (EIS) techniques were used to characterize the properties of the sensor. Under optimum experimental conditions, the respective linear calibration range was rectilinear over the range from 2.0×10^{-8} to 0.8×10^{-3} mol L^{-1} with a correlation coefficient of 0.9997 for differential pulse voltammetry (DPV) in Britton–Robinson buffer at pH 2.0. The lower limit of detection (LOD) and limit of quantification (LOQ) were found to be 7.07×10^{-10} mol L^{-1} and 2.35×10^{-9} mol L^{-1}, respectively. The utility of this modified electrode was demonstrated for the determination of EN in real samples.

Keywords: Methionine; Palladium.

72. Potentiometric Multi-Walled Carbon Nanotube Zn-Sensor Based on A Naphthalocyanine Neutral Carrier: Experimental and Theoretical Studies

Ola R. Shehab and Ahmed M. Mansour

Rsc Advances, 5: 58416-58427 (2015) IF: 3.84

A new multi-walled carbon nanotube graphite paste sensor based on 2,11,20,29-tetra-tert-butyl-2,3-naphthalocyanine as neutral carrier (2.0%), 2-flouorophenyl-2-nitrophenyl ether (50.0%) as plasticizer, and sodium tetrakis-imidazolyl borate (1.0%) as anionic additive has been explored as a selective sensor for determination of Zn2+ in real samples. The electrode showed a fast response time of 5 s, gave Nernstian response (29.9 mV/decade) over the concentration range 1.0×10^{-8}-1.5×10^{-4} molL^{-1}, and could be used in the pH range of 4.3-7.5 with a detection limit of 5.0×10^{-9} mol L-1. The response mechanism of the electrode was investigated using UV-vis. and FT IR. Scanning electron microscope combined with energy dispersive X-ray spectrum were used to confirm the reaction between Zn2+ ions and naphthalocyanine on the surface of the electrode. In order to predict the selectivity of naphthalocyanine sensor for different metal ions, the corresponding binding energies of the metal complexes were calculated at Hartree-Fock level of theory.

Keywords: Naphthalocyanine; Mwcnt; Zinc(II); Nbo.

73. Photocatalytic Degradation of Methylene Blue with Hematite Nanoparticles Synthesized by Thermal Decomposition of Fluoroquinolones Oxalato– iron(III) Complexes

Ahmed M. Mansour

Rsc Advances, 5: 62052-62061 (2015) IF: 3.84

$[Fe(C_2O_4)(FQ)(H_2O)_2]$ complexes (H-FQ = ciprofloxacin (1), lomefloxacin (2) and norfloxacin (3)) were synthesized and characterized using a variety of analytical and spectral techniques such as elemental analysis, infrared spectroscopy, thermogravimetric analysis, ultraviolet-visible spectroscopy, magnetic and conductance measurements. The experimental studies were complemented by quantum chemical calculations in terms of geometry optimization, natural bond orbital analysis and molecular electrostatic potential maps. Electronic structures were discussed by TD-DFT. Hematite (a-Fe$_2$O$_3$) nanoparticles, as a promising material for different catalytic applications, were prepared in air via the controlled thermal decomposition of 1-3. Powder X-ray diffraction was used to identify the polymorph of iron oxide. The morphology of nano-hematite was investigated by a field emission scanning electron microscope coupled to energy-dispersive X-ray spectroscopy for surface analysis. The catalytic degrad--ation of methylene-blue (MB), as industrial pollutant, exposed to UV radiation in presence of nano- a-Fe$_2$O$_3$ as a catalyst and hydrogen peroxide as the oxidant was studied at room temperature in water.
Keywords: Fluoroquinolones; Oxalato complexes; NBO; Catalytic activity; Methylene-blue.

74. Sulfamethazine Copper (II) Complexes as Antimicrobial Thermal Stabilizer and Co-Stabilizers For Rigid PVC: Spectroscopic, Thermal, and DFT Studies

Ahmed M. Mansour and Riham R. Mohamed

Rsc Advances, 5: 5415-5423 (2015) IF: 3.84

$[CuL_2(OH_2)]\cdot 1.5H2O$ (1), $[CuL_2(bpy)]\cdot 0.66H_2O$ (2) and $[CuLQ(OH_2)]\cdot H_2O$ (3) (HL = sulfamethazine, bpy = 2,2'-bipyridine and HQ = 8-hydroxyquinoline) complexes have been prepared, characterized (elemental analysis, IR, TGA, UV-Vis., magnetic and conductivity measurement), and tested for their antibacterial activity. Coordination of HL to Cu(II) ion did not markedly change its toxicity, but the presence of a secondary ligand gave rise to lower activity. Sulfamethazine and its complexes have been investigated as thermal stabilizers and co-stabilizers for the rigid PVC. A synergism has been achieved when the investigated compounds were mixed in equivalent weight ratio with the reference stabilizers. The experimental studies have been complemented by DFT data in terms of optimization, natural bond orbital analysis, and molecular electrostatic potential maps. Structural-thermal stabilization relationship showed that EHOMO, E, and softness are the most considerable descriptors for the correlation with the thermal stability.
Keywords: Sulfamethazine metal complexes; Thermal stabilizer; Synergistic effect; PVC; DFT; NBO.

75. Synthesis of Heterocycles and Fused Heterocycles Catalyzed by Nanomaterials

Ahmed H. M. Elwahy and Mohamed R. Shaabana

Rsc Adv, 5: 75659-75710 (2015) IF: 3.84

This review focuses, on the application of nanomaterials as heterogeneous catalysts for the synthesis of different heterocyclic systems. We pay special attention to the specific synthesis of such systems in an organized manner with respect to the type of the heterocyclic systems.
Keywords: Nanomaterials; Synthesis; Heterocycles; Catalyst.

76. Photochemistry of Methyl Hypobromite (CH$_3$OBR): Excited States and Photoabsorption Spectrum

Ljiljana Stojanovi, Gessenildo Pereira Rodrigues, Saadullah G. Aziz, Rifaat H. Hilal and Mario Barbatti

Rsc Advances, 5: 97003-97015 (2015) IF: 3.84

he singlet and triplet excited states of CH3OBr with excitation energies up to similar to 9.5 eV are studied using the multi-reference configuration interaction with singles and doubles method (MRCI-SD) and several single-reference methods, including time-dependent density functional theory (TD-DFT), coupled-cluster (linear-response CC2 and equation-of-motion CCSD and CCSD(T)), and algebraic diagrammatic construction (ADC(2)). Among the single-reference methods, coupled-cluster gives vertical excitation energies and oscillator strengths comparable to the MRCI-SD values for the majority of excited states. The absorption cross section in the gas phase in the region between 2 and 8.5 eV was simulated with CCSD using the nuclear ensemble approach. The computed spectrum predicts two intense absorption bands. The first band, peaked at similar to 7.0 eV, is induced by Rydberg excitation. The second band has a strong overlap between a broad sigma sigma* transition and three Rydberg transitions, resulting in two peaks at 7.7 and 7.9 eV. The spectrum also features a low-intensity band peaking at similar to 4.6 eV due to n sigma* excitation. The intensity of this band is influenced by spin-orbit coupling effects. We analyzed the dissociation pathways along the O-Br and C-O coordinates by computing rigid potential energy curves of the ground and the lowest-lying singlet and triplet excited states, and discussed the possible dissociation products. Due to the specific electronic structure of the excited states, characterized by multireference, double excitations, and Rydberg states occurring in the low-energy region, their correct description along dissociation coordinates is feasible only with MRCI-SD
Keywords: Density-functional theory; Coupled-cluster methods; Correlated molecular calculations; Gaussian-basis.

77. Electrochemical and Surface Characteristics of Sputter-Deposited Amorphous Mn–Zr–Cr Alloys in A 1 M H$_2$sO$_4$ Solution

A. A. El-Moneim, M. Ezzata and W. A. Badawy

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The effect of alloying zirconium and chromium on the electrochemical behavior of Mn–Zr–Cr alloys in H$_2$SO$_4$ solutions

was investigated. The alloy surface was analyzed by XPS. The corrosion rates of the ternary Mn–Zr–Cr alloys are lower than those of the binary alloys containing the same amount of manganese and decrease on increasing the chromium content. The effect of alloying Cr and Zr with Mn is based on the synergistic interaction between their cations in the oxy-hydroxide passive films formed under open circuit conditions. The passivity enhancement is due to chromium enrichment in the surface film and the underlying alloy surface

Keywords: Manganese alloys; Sputtered films; Polarization; Xps; Passive films.

78. High-performance Supercapacitors using Graphene/ Polyaniline Composites Deposited on Kitchen Sponge

Mahmoud Moussa, Maher F El-Kady, Hao Wang, Andrew Michimore, Qinqin Zhou, Jian Xu, Peter Majeswki and Jun Ma

We in this study used a commercial grade kitchen sponge as the scaffold where both graphene platelets (GnPs) and polyaniline (PANi) nanorods were deposited. The high electrical conductivity of GnPs (1460 S cm^{-1}) enhances the pseudo-capacitive performance of PANi grown vertically on the GnPs basal planes; the interconnected pores of the sponge provide sufficient inner surface between the GnPs/PANi composite and the electrolyte, which thus facilitates ion diffusion during charge and discharge processes. When the composite electrode was used to build a supercapacitor with two-electrode configuration, it exhibited a specific capacitance of 965.3 F g-1 at a scan rate of 10 mV s^{-1} in 1.0 M H$_2$SO$_4$ solution. In addition, the composite Nyquist plot showed no semicircle at high frequency corresponding to a low equivalent series resistance of 0.35 O. At 100 mV s^{-1}, the supercapacitor demonstrated an energy density of 34.5 Wh kg^{-1} and a power density of 12.4 kW kg^{-1} based on the total mass of the active materials on both electrodes. To demonstrate the performance, we built an array consisting of three cells connected in series, which lit up a red light emitting diode for five minutes. This simple method holds promise for high-performance yet low-cost electrodes for supercapacitors.

Keywords: Composites; Graphene; Supercapacitor; Sponge; Polyaniline.

79. Nanocomposites Based on Chitosan-graft- Poly (N-Vinyl- 2-Pyrrolidone): Synthesis, Characterization, and Biological Activity

Mohamed S. Abdel Aziz, Hala F. Naguib and Gamal R. Saad

Organophilic montmorillonite (OMMT) was synthesized by cationic exchange between Na$^+$-MMT and N-octyl-N-vinyl-2-pyrrolidonium bromide. Chitosan graft copolymer nanocomposites were synthesized by grafting N-vinyl-2-pyrrolidone onto chitosan in aqueous acetic acid in the presence of OMMT using free radical polymerization. The chemical structures were verified by FTIR. Scanning electron microscopy showed a surface roughness for chitosan graft nanocomposites. Wide-angle X-ray diffraction confirmed the intercalation of grafted chitosan chains between OMMT galleries. Thermogravimetric analysis indicated that the thermal stability of grafted chitosan was enhanced by OMMT incorporation. Preliminary studies showed that the nanocomposites exhibited antimicrobial activity compared with chitosan graft copolymer.

Keywords: Antimicrobial activity; Chitosan; Grafting; Nanocomposites; Thermal stability.

80. Surface Morphology Changes of Polymer Membrane and Carbon Paste Sertraline Sensors

M. M. Khater, H. B. Hassib, Y.M. Issa and S.H.Mohammed

Polymer membrane and chemically modified carbon paste (CMCP) sensors for determination of sertraline HCl (Ser-Cl) incorporating sertraline tetraphenylborate (Ser-TPB) as an electro-active material were constructed. They showed a rapid and linear response for Ser-ion over the concentration range 0.01–10.00 mmol L-1. The limits of detection were 2.80 and 9.55 μmol L-1, and Nernastian slopes were 56.60, 59.60 mV decade-1 for membrane and CMCP sensors for batch method. In flow injection analysis (FIA), the electrodes revealed comparatively good selectivity for Ser-ion with regard to a wide variety of different cations, sugars, and amino acids. The addition of different anionic additives, namely sodium tetraphenylborate (NaTPB), potassium tetraphenylborate (KTPB), potassium tetrakis[3,5-bis-(triflouromethyl)phenyl]borate (KTFMPB), and sodium tetrakis[3,5-bis(trifluoro-methyl)phenyl]borate (NaTFMPB), to the prepared mixture improved their response characteristics. The surface morphologies of membrane films containing PVC only (blank), plasticizer+PVC, Ser-TPB+plasticizer+PVC, and Ser-TPB +plasticizer+PVC+additive were studied using scanning and atomic force electron microscopes. These sensors had been used in the potentiometric titration of Ser-ion against NaTPB. Standard addition method for the pure raw material and some of its pharmaceutical tablets was used for Ser-Cl determination. The obtained results were tested for their repeatability and reproducibility and were statistically treated by F- and t- tests.

Keywords: Sertraline HCl; Graphite; Tetraphenylborate; Membrane sensor; Carbon paste sensor; Sem.

81. Development of Electroless Ni–P Modified Aluminum Substrates in A Simulated Fuel Cell Environment

Amani E. Fetohi, R.M. Abdel Hameed and K.M. El-Khatib

The corrosion resistance of electroless Ni–P coating on pure Al, Al 6061, Al 3004 and Al 1050 is examined in an environment simulated to PEM fuel cell. Potentiodynamic polarization techniques, Interfacial contact resistance, surface morphology, chemical composition of coated substrates and EIS measurements have been investigated. Modified Al 1050 showed reduction in its corrosion current density by 44.69 times. It also showed the best stability of all modified Al substrates. The formed Ni–P layer on Al 1050 is thicker by about 3 times, relative to that on Al 6061 and has higher Ea value of 135.68 kJ mol^{-1} supporting its lower corrosion rate.

Keywords: Electroless plating; Nickel–phosphorous; Aluminum; Potentiodynamic polarization technique; Fuel cells.

82. Synthesis and Antiviral Activity of Some New Bis-1,3-Thiazole Derivatives

Kamal M. Dawood, Taha M.A. Eldebss, Heba S.A. El-Zahabi and Mahmoud H. Yousef

Treatment of 3-phenyl-1,3-thiazolidin-4-one derivative 1 with phenylisothiocyanate in DMF, in the presence of potassium hydroxide, at room temperature gave the non-isolable potassium salt 2. The insitu reaction of 2 with differently substituted N-aryl hydrazonoyl chlorides 3, 7aed and 14aed afforded the corresponding 2-(pyrazolyl)thiazolylimino-5-(thiadiazolylidene) thiazolidin-4-one derivatives 6, 10a ed and 17aed, respectively. Reaction of 2 with further a-haloketones yielded the 4-(pyrazolyl)thiazolylimino-bis-thiazolidine derivatives 22, 25 and 26. Single crystal X-ray analysis was used in structure elucidation of the products. The in-vitro antiviral screening against four viruses (Poliovirus, Influenza A (H1N1) virus, Hepatitis B virus and Hepatitis C virus) for the obtained compounds was examined. Structure activity relationship (SAR) was also studied. The goal of the work was achieved in discovering a very active compound 10a as anti HCV agent (EC50 0.56 mM)
Keywords: Pyrazole 1,3-Thiazole 1,3,4-Thiadiazole Antiviral Activity SAR.

83. New and Efficient Approach for Synthesis of Novel Bioactive [1,3,4] Thiadiazoles Incorporated with 1,3-Thiazole Moiety

Thoraya A. Farghaly, Magda A. Abdallah, Ghada S. Masaret and Zeinab A. Muhammad

A series of novel 1,3,4-thiadiazoles incorporated with thiazole moiety was synthesized by reaction of 5- acetyl-2-benzoylimino-3-phenyl-1,3,4-thiadiazole thiosemicarbazone 2 with each of N-phenyl 2-oxopropanehydrazonoyl chloride 3 and ethyl (N-aryl-hydrazono) chloroacetate 5 in dioxane in basic medium. Also, another series of 1,3,4-thiadiazole incorporated with thiazole moiety was prepared by reaction of 5-acetyl-2-benzoylimino-3-phenyl-1,3,4-thiadiazole thiocarbohydrazone with each of hydrazonoyl chlorides 3, 5 and 18 under the same reaction conditions. The mechanisms of the studied reactions were discussed and the assigned structure for each of the new products was identified via elemental and spectral data and by alternative method whenever possible. Moreover, the antimicrobial activity for some selected products was screened, and the results obtained exploring the high potency of some of the tested compounds compared with the employed standard bactericides and fungicide.
Keywords: 1,3,4-Thiadiazole; Hydrazonoyl chlorides; Carbonothioic dihydrazide; Thiazoles; Antimicrobial activity.

84. Identification of Novel Aminothiazole and Aminothiadiazole Conjugated Cyanopyridines as Selective CHK1 Inhibitors

Sobhi M. Gomha, Mohamed M. Abdulla and Sahar M. Abou-Seri

Inhibitors of checkpoint kinase 1 (CHK1) are of current interest as potential anti-tumor agents. Novel series of cyanopyridyl-aminothiadiazoles (synthesized from reaction of 1-(3-cyano-4,6-diphenylpyridin-2-yl)-3-phenylthiourea (14) with hydrazonoyl halides) and cyanopyridyl-aminothiazolyl-thiadiazoles (synthesized from treatment of 14 with ethyl chloroacetate followed by reaction of the obtained cyanopyridyl-aminothiazole with hydrazonoyl halides) were synthesized and evaluated for their CHK1 inhibitory potential using a cell-based assay cascade. The tested compounds exhibited a potent and selective CHK1 inhibitory activity at nanomolar levels that reflected their ability to abrogate cell cycle arrest and potentiate the cytotoxic effect of the genotoxic drug gemcitabine in colon cancer cells. Molecular modeling simulation revealed that, the most active compound 28a docked well into the enzyme active site and their complex is stabilized by a key H-bonding with the backbone amide of Cys-87 as well as multiple favorable hydrophobic interactions with different hydrophobic binding regions of the enzyme.
Keywords: 2-Aminocyanopyridine 1,3,4-Thiadiazoles Hydrazonoyl Halides Selective Chk1 Inhibitors.

85. Towards Improving the Catalytic Activity and Stability of Platinum-Based Anodes in Direct Formic Acid Fuel Cells

Ahmad M. Mohammad, Gumaa A. El-Nagar, Islam M. Al-Akraa, Mohamed S. El-Deab and Bahgat E. El-Anadouli

The current investigation presents a novel catalyst for formic acid electro-oxidation (FAO); the essential anodic reaction in direct formic acid fuel cells (DFAFCs). The catalyst is developed by a sequential electrodeposition method for Pt (PtNPs), Au (AuNPs) and nickel oxide (nano-NiOx) nanoparticles onto the surface of a glassy carbon (GC) electrode. The objective of this modification was solely dedicated to the improvement of the electrode's catalytic activity by overcoming the CO poisoning, which is usually responsible for the deterioration of the catalytic performance of DFAFCs. The deposition sequence of the catalyst ingredients (PtNPs, AuNPs, and nano-NiOx) was adjusted to optimize the electrocatalytic activity and stability of the catalyst towards FAO. Interestingly, the highest catalytic activity and stability towards FAO was obtained at the NiOx/Au/Pt/GC electrode in which PtNPs were directly deposited onto the GC electrode followed by AuNPs then nano-NiOx. The discussion is oriented to adopt the role of the ternary catalyst ingredients in the catalytic enhancement.
Keywords: Electrocatalysis; Gold nanoparticles; Platinum nanoparticles; Nickel oxide nanoparticles; Direct formic acid fuel cells; Third body effect.

86. Electrocatalysis by Design: Synergistic Catalytic Enhancement of Formic Acid Electro-Oxidation at Core–Shell Pd/Pt Nanocatalysts

Islam M. Al-Akraa, Ahmad M. Mohammad, Mohamed S. El-Deab and Bahgat E. El-Anadouli

The modification of a glassy carbon (GC) electrode with palladium (PdNPs) and platinum (PtNPs) nanoparticles is targeted to fabricate efficient anodes for the formic acid (FA) electro-oxidation (FAO). A proper adjustment of the deposition sequence and loading of PdNPs (as a shell) over PtNPs (as a core) of the nanocatalyst could eventually enhance its electrocatalytic activity towards FAO in such a way suppressing the CO poisoning pathway. It also improved the prolonged mechanical stability of the catalyst over a prolonged time of continuous electrolysis of FA. The highest oxidation efficiency, in terms of the catalytic activity and stability, is obtained at the Pd/Pt/GC electrode (with PtNPs directly deposited onto the GC electrode followed by ca. 6 monolayers of PdNPs). The role of PdNPs and PtNPs in the catalytic enhancement is discussed.

Keywords: Binary nanocatalyst; Electrocatalysis; Fuel cells; Stability; Formic acid electro-oxidation.

87. Electrocatalytic Oxidation of Methanol on Ordered Binary Catalyst of Manganese and Nickel Oxide Nanoparticles

R.H. Tammam, A.M. Fekry and M.M. Saleh

The electrooxidation of methanol from alkaline medium at different arrangement of binary catalysts composed of NiOx and MnOx nanoparticles modified glassy carbon electrode (GC) is studied. Different techniques such as cyclic voltammetry (CV), electrochemical impedance spectroscopy (EIS) and scanning electron microscopy (SEM) are used for the characterization of those electrocatalysts. The enhancement of the electrocatalytic oxidation of methanol depends essentially on the arrangement and the loading extent of the NiOx nanoparticles. The arrangement in which MnOx is deposited first followed by NiOx nanoparticles (GC/MnOx/NiOx) reveals the best performance. The study is performed under different loadings of the NiOx catalyst and different concentrations of methanol. Minimum loading of NiOx is required to obtain synergism between MnOx and NiOx. The EIS results confirm the above trends and also help to interpret the above conclusions.

Keywords: Methanol; Catalysis; Nickel; Manganese; Nanoparticles.

88. Unravelling the Interplay of Dopant Concentration and Band Structure Engineering of Monoclinic Niobium Pentoxide: A Model Photoanode for Water Splitting

T.S. El-Shazly, Walid M.I. Hassan, Sayed T. Abdel Rahim and Nageh K. Allam

The electronic properties of the pristine and tungsten-doped monoclinic niobium pentoxide (B–Nb$_2$O$_5$) crystals have been investigated using density functional theory generalized gradient approximation (GGA) with the semi-localized Revised Perdew, Burke, and Ernzerhof (RPBE) functional. The use of RPBE allowed the accurate calculation of the band gap. The band gap of B–Nb$_2$O$_5$ (3.45 eV) can be significantly reduced and tuned via W-doping down to 1.39 eV. The W 5d orbitals affected the position of conduction band minimum (CBM) with negligible effect on the valence band maximum (VBM). The calculated band gaps of the W–Nb$_2$O$_5$ showed a bowing phenomenon, which was attributed to charge exchange as well as volume change. Moreover, the calculated band positions indicated staggered band gap characteristics of the W-doped Nb2O5. Furthermore, the calculated charge carrier concentration of highly doped Nb2O5, estimated by Boltzmann-like distribution, is close to that of Si, making the material of potential interest in solar energy conversion applications. Eventually, the optical dielectric function showed an increased electronic contribution of the dielectric constant associated with a metallic behavior of the W-doped Nb2O5 at high W content, while the absorption spectrum and refractive index of the studied systems pointed out a red-shift and cladding behaviors, respectively.

Keywords: Band structure; Doping effect; Charge carrier; Dielectric constant.

89. Optimization of Manganese Oxide Amount on Vulcan XG-72R Carbon Black as A Promising Support of Ni Nanoparticles for Methanol Electro-Oxidation Reaction

R.M. Abdel Hameed

Different Ni-MnOx/C electrocatalysts were prepared by chemical reduction of nickel ions at MnOx/C, containing various metal oxide weight percentages, as a support. Sodium borohydride was employed as a reducing agent with the aid of microwave irradiation. Electrocatalyst surface morphology, crystalline structure and chemical composition were characterized by transmission electron microscopy (TEM), X-ray diffraction (XRD) and energy dispersive X-ray analysis (EDX), respectively. Incorporating manganese oxide in Ni-MnOx/C resulted in the formation of smaller and homogeneously distributed nickel nanoparticles. Electrocatalytic activity of Ni-MnOx/C towards methanol oxidation reaction in KOH solution was investigated using cyclic voltammetry, chronoamperometry and electrochemical impedance spectroscopy.

The oxidation current density was enhanced with increasing MnOx weight percentage to achieve the highest activity at Ni-MnOx/C containing 7.5 wt.% MnOx. The electrocatalyst stability during long-time operation was examined. A lower charge transfer resistance value was measured at Ni-MnOx/C surface when methanol was introduced to the supporting electrolyte. A faster electron transfer rate was observed when MnOx was added in an increased content.

Keywords: Nickel; Manganese oxide; Methanol; Electrooxidation; Cyclic voltammetry.

90. Ni–P–Sno₂/C Composite: Synthesis, Characterization and Electrocatalytic Activity for Methanol Oxidation in KOH Solution

R.M. Abdel Hameed and Rabab M. El-Sherif

Ni–P–SnO₂/C composite was prepared by electroless reduction of nickel ions on SnO₂/C powder. The weight percentage of SnO2 in the prepared composite was varied as 2.5–20. Scanning electron microscopy (SEM) and energy dispersive X-ray (EDX) analysis were employed to investigate the morphology, particle size and chemical composition of Ni–P–SnO2/C composite. Nickel islands with an average diameter of 0.33 µm were formed in the composite containing 10 wt.% SnO₂ [Ni–P–SnO2/C-10]. The electrochemical performance of Ni–P–SnO₂/C composite in KOH solution was studied using cyclic voltammetry and electrochemical impedance spectroscopy (EIS). Its electron transfer coefficient and electron transfer rate constant values were determined as a function of SnO₂ weight percentage. The impedance value was found to gradually decrease with increasing SnO2 content getting its lowest value in Ni–P–SnO₂/C-10 composite. The effect of altering the sweeping potential and KOH concentration on NiOOH film thickness in Ni–P–SnO₂/C composite was investigated. An enhanced electrocatalytic activity of the prepared composite towards methanol oxidation in KOH solution was shown. In presence of methanol, the diameter of semi-circle was greatly reduced to record a much lowered Rct value of 0.25 Ω cm2.

Keywords: Nickel; Electroless deposition; Tin oxide; Electrochemical impedance spectroscopy; Methanol oxidation; KOH.

91. Electrochemical Performance of Tungsten Electrode as Cathode for Hydrogen Evolution in Alkaline Solutions

W.A. Badawy, G.M. Abd El-Hafez and H. Nady

The electroatalytic activity of the tungsten metal as cathode for hydrogen evolution in alkaline solutions was investigated by open circuit potential measurements, potentiodynamic polarization techniques and electrochemical impedance spectroscopy (EIS). It was found that the onset potential of the hydrogen evolution reaction (HER) on tungsten is in favor of the hydrogen generation at lower overpotential, compared to Pt electrode. The effect of electrolyte concentration, scan rate on the rate of the HER as well as the electrochemical stability of the cathode was studied. The kinetic parameters characteristic for the hydrogen evolution reaction i.e. cathodic transfer coefficient, exchange current density and also corrosion rates were determined using Tafel extrapolation method. The results reveal that tungsten can be considered as a good candidate for hydrogen evolution on large scale and for long term production. The rate of hydrogen evolution is relatively high under low overpotential.

Keywords: Cathodic ; Hydrogen ; Evolution electrochemical Activity; EIS polarization; Tungsten.

92. Electrochemical Sensor Based on Ionic Liquid Crystal Modified Carbon Paste Electrode in Presence of Surface Active Agents for Enoxacin Antibacterial Drug

Nada F. Atta, Ahmed Galal, Shereen M. Azab and Asmaa H. Ibrahim

A sensitive electrochemical sensor based on carbon paste and inclusion of ionic liquid crystal [(1-Butyl-1-methylpiperidinium hexafluorophosphate)] in presence of sodium dodecyl sulfate (ILCMCPE. . . ..SDS) for the electrochemical determination of Enoxacin (EN) was prepared. Different ionic liquids were used and compared, namely (1-n-Hexyl-3-methyl imidazolium tetrafluoroborate) (ILMCPE1. . . ..SDS) and (1-Butyl-4-methyl pyridinium tetrafluoroborate) (ILMCPE2. . . ..SDS). The studied ionic liquids mimic cell membranes for their interaction with drug intake through cell membranes. We found that ILCMCPE. . . ..SDS exhibited good electrochemical performances with higher conductivity and lower electron transfer resistance due to the combining effect of high ion conductivity, sensitivity, fast electron transfer, stability and antifouling ability of the ionic liquid crystal. SDS enhanced the preconcentration/accumulation of EN species in the ionic form at the surface. Excellent performance of ILCMCPE. . . ..SDS for the determination of EN in the linear dynamic range of 6.67×10-7 to 2.22×10-5 mol L-1 with a correlation coefficient 0.9998 and LOD 3.28×10-9 mol L-1. Simultaneous determination of binary mixtures dopamine/enoxacin and epinephrine/enoxacin was demonstrated with good peak potentials separations. This method was successfully applied for direct determination of EN in human urine samples with good recovery results. The ILCMCPE. . . ..SDS showed also high reproducibility selectivity and anti - interference ability.

Keywords: Ionic liquid crystal; Electroanalysis; Enoxacin; Surfactants; Carbon paste electrode.

93. Electrochemistry and Detection of Dobutamine At Gold Nanoparticles Cobalt-phthalocyanine Modified Carbon Paste Electrode

Nada F. Atta, Ahmed Galal, Fatma M. Abdel-Gawad and Eman F. Mohamed

Electrochemical sensor was fabricated for determination of dobutamine (DB) based on gold nanoparticles/ cobaltphthalocyanine modified carbon paste electrode AuCoPcCPE. Two components in the composite structure contribute to the faradaic signal at the interface of the electrode: conduction ofAu-nano-centers and charge mediation through cobalt-phthalocyaninemoieties. The proposed sensor exhibited excellent performance for the determination of DB in human urine samples with satisfying recovery results. Low detection limit of 0.84×10-7 mol L-1 in the linear dynamic range of 6.0×10-6 mol L-1 to 2.0×10-4 mol L-1 was obtained at the AuCoPcCPE sensor. Itwas possible to simultaneously and selectively determine DB in each of the following mixtures:DB/Morphine, DB/paracetamol using the AuCoPcCPE sensor. The proposed

sensor exhibited high reproducibility, enhanced sensitivity, selectivity, and unique stability.

Keywords: Cobaltphthalocyanine; Dobutamine; Electrochemical sensor; Gold nanoparticles; Morphine.

94. Electrocatalysis by Nanoparticle: Enhanced Electro-Oxidation of Formic Acid at NiO$_x$–Pd Binary Nanocatalysts

Islam M. Al-Akraa, Ahmad M. Mohammad, Mohamed S. El-Deab and Bahgat E. El-Anadouli

This study addresses formic acid (FA) electro-oxidation (FAO) at a binary catalyst composed of palladium (PdNPs) and nickel oxide (nano-NiOx) nanoparticles electrodeposited onto a glassy carbon (GC) electrode. The deposition sequence of PdNPs and nano-NiOx onto the GC electrode is properly adjusted in such a way that maximizes the electrode efficiency toward FAO. The highest catalytic activity and stability are obtained at the NiOx/Pd/GC electrode (with PdNPs directly deposited onto the GC electrode followed with nano-NiOx with an optimum surface coverage, , of ca. 41%). The enhancement is manifested in the increase of the oxidation peak current of FA together with a favorable negative shift of the onset potential of FAO. It is believed that nano-NiOx could facilitate the direct oxidation of FA via minimizing the amount of the poisoning species at the Pd surface.

Keywords: Electrocatalysis; Fuel cells; Formic acid.

95. Synthesis, Characterization and Application of Biodegradable Crosslinked Carboxymethyl Chitosan/Poly (Vinyl Alcohol) Clay Nanocomposites

Magdy W. Sabaa, Heba M. Abdallah, Nadia A. Mohamed and Riham R. Mohamed

Crosslinked poly(vinyl alcohol) (PVA) / carboxymethyl chitosan (CMCh) nanocomposites were synthesized using terephthaloyl diisothiocyanate crosslinker, in the presence of montmorillonite (MMT), in different ratios of the two matrices. Characterization of nanocomposites was performed using different analyses. Swelling behavior was studied in different buffer solutions. It was found that formation of crosslinked CMCh/PVA hydrogels increased the swellability. Metal ions adsorption has also been investigated. The results indicated that crosslinked CMCh adsorbs various metal ions much more than non crosslinked CMCh. Antimicrobial activity was examined against Gram positive bacteria, Gram negative bacteria, and also fungi. Results indicated that most of these nanocomposites exhibited good antimicrobial potency. Degradation study was carried out in Simulated Body Fluid (SBF) for different time periods in order to find out degradation index (Di). Results showed that weight loss of most of the nanocomposites increased as a function of incubation time.

Keywords: Carboxymethyl chitosan; Poly (vinyl alcohol); Nanocomposites; Swelling; Antimicrobial potency.

96. The First Bidirectional [4+2] Cycloadditions of Benzo[1,2:4,5]dicyclobutenes: Synthesis of Benzo [1,2-f:4,5-f] diisoindole-1,3,7,9-tetraones

Ismail Abdelshafy Abdelhamid and Holger Butenschön

Bidirectional reactions are an efficient tool for the synthesis of larger, often symmetric compounds. While the ring opening of benzocyclobutene derivatives with subsequent cycloaddition of the ortho-quinodimethanes formed has extensively been used for syntheses of various classes of compounds, such as steroids, acenes, natural as well as unnatural oligocycles including heterocyclic systems, the respective bidirectional reactions have barely been explored.

In the present publication the first bidirectional cycloadditions starting from benzo[1,2:4,5]¬dicyclo-butene derivatives are presented usingv N-methylmaleinimide as the dienophile. The benzo[1,2:4,5]¬dicyclo¬butene derivatives used have in common that they are dimethylacetals of the respective diones. As a consequence, the cycloadducts easily undergo subsequent eliminations of methanol. Following dehydrogenations generate the aromatic anthracene systems, which are part of the benzo[1,2-f:4,5-f']diisoindole-1,3,7,9-tetraone derivatives formed as the final products.

Keywords: Anthracene; Benzo[1,2:4,5]¬dicyclo¬butene; Bidiractional cycloadditions; Heterocy-cles; Sequential transformations.

97. Biorenewable Thermosetting Copolymer Based on Soybean Oil and Eugenol

Kunwei Liu, Samy A. Madbouly and Michael R. Kessler

A novel biorenewable thermoset based on acrylated epoxidized soybean oil (AESO) and methacrylated eugenol (ME) was prepared via free radical polymerization. The chemical compositions of the monomers were investigated using proton nuclear magnetic resonance (^{1}H NMR) technique. The properties of this resin system were investigated using small amplitude oscillatory shear flow rheology, dynamic mechanical analysis (DMA), thermogravimetric analysis (TGA), and compression testing. Soxhlet extraction was also performed on the cured thermoset to determine the percentage of monomers that are incorporated into the crosslink network. In addition, the gelation time of this resin at different curing temperature was also monitored using a rheometer.

The Soxhlet extraction data indicated that more than 95% of the monomers were incorporated into the crosslink network. Gelation time study showed that this resin system can become a solid within 10 min. This resin system possesses high strength and modulus, and it is thermally stable up to 300 C. This high biorenewable content resin system possesses good mechanical properties, high thermal stability, and fast curing speed, making it a suitable matrix resin for the pultrusion process and other composite manufacturing processes.

Keywords: Bio-based; Soybean oil; Rheology; Thermosets; NMR; DSC.

98. Individual and Competitive Adsorption of Phenol and Nickel Onto Multiwalled Carbon Nanotubes

Nour T. Abdel-Ghani, Ghadir A. El-Chaghaby and Farag S. Helal

Individual and competitive adsorption studies were carried out to investigate the removal of phenol and nickel ions by adsorption onto multiwalled carbon nanotubes (MWCNTs). The carbon nanotubes were characterized by different techniques such as X-ray diffraction, scanning electron microscopy, thermal analysis and Fourier transformation infrared spectroscopy. The different experimental conditions affecting the adsorption process were investigated. Kinetics and equilibrium models were tested for fitting the adsorption experimental data. The characterization experimental results proved that the studied adsorbent possess different surface functional groups as well as typical morphological features. The batch experiments revealed that 300 min of contact time was enough to achieve equilibrium for the adsorption of both phenol and nickel at an initial adsorbate concentration of 25 mg/l, an adsorbent dosage of 5 g/l, and a solution pH of 7. The adsorption of phenol and nickel by MWCNTs followed the pseudo-second order kinetic model and the intraparticle diffusion model was quite good in describing the adsorption mechanism. The Langmuir equilibrium model fitted well the experimental data indicating the homogeneity of the adsorbent surface sites. The maximum Langmuir adsorption capacities were found to be 32.23 and 6.09 mg/g, for phenol and Ni ions, respectively. The removal efficiency of MWCNTs for nickel ions or phenol in real wastewater samples at the optimum conditions reached up to 60% and 70%, respectively.
Keywords: Adsorption; Carbon nanotubes; Nickel; Phenols; Equilibrium modeling.

99. A Review on Solar Cells From Si-Single Crystals to Porous Materials and Quantum Dots

Waheed A. Badawy

Solar energy conversion to electricity through photovoltaics or to useful fuel through photoelectrochemical cells was still a main task for research groups and developments sectors. In this article we are reviewing the development of the different generations of solar cells. The fabrication of solar cells has passed through a large number of improvement steps considering the technological and economic aspects. The first generation solar cells were based on Si wafers, mainly single crystals. Permanent researches on cost reduction and improved solar cell efficiency have led to the marketing of solar modules having 12–16% solar conversion efficiency. Application of poly-crystalline Si and other forms of Si have reduced the cost but on the expense of the solar conversion efficiency. The second generation solar cells were based on thin film technology. Thin films of amorphous Si, CIS (copper–indium–selenide) and t-Si were employed. Solar conversion inefficiencies of about 12% have been achieved with a remarkable cost reduction. The third generation solar cells are based on nano-crystals and nano-porous materials. An advanced photovoltaic cell, originally developed for satellites with solar conversion efficiency of 37.3%, developed. It is based on extremely thin concentration cells. New sensitizer or semiconductor systems are necessary to broaden the photo-response in solar spectrum. Hybrids of solar and conventional devices may provide an interim benefit in seeking economically valuable devices. New quantum dot solar cells based on CdSe–TiO2 architecture have been developed.
Keywords: Nanotechnology; Porous si; Quantum dots; Solar cells; Solar energy conversion.

100. A New One-pot Synthesis of Novel Hetarylazo-Heterocyclic Colorants and Study of their Solvatochromic Properties

Ahmad S. Shawali, Magda A. Abdallah and Mohamed A. Kandil

A simple synthetic strategy for synthesis of new series of hetarylazo-heterocycles is described. The effects of solvent on their electronic absorption spectra were analyzed using Kamlet–Taft equation. The results of fitting coefficients indicated that the solvatochromism of the studied compounds is mainly due to the solvent polarity rather than the solvent basicity and acidity
Keywords: 3-Chloroformazans; Azo compounds; Pyrazoles; Imidazoles; Heterocycles; Solvatochromism.

101. Utility of *N*-Aryl 2-Aroylhydrazonopropanehydrazonoyl Chlorides as Precursors for Synthesis of New Functionalized 1,3,4-Thiadiazoles with Potential Antimicrobial Activity

Abdou O. Abdelhamid, Sobhi M. Gomha and Ahmad S. Shawali

Starting from N-aryl 2-aroylhydrazono-propanehydrazonoyl chlorides, a series of new functionalized 1,3,4-thiadiazoles were prepared. The structures of the compounds prepared were confirmed by both elemental and spectral analyses as well as by alternate synthesis. The mechanisms of the studied reactions are outlined. The antimicrobial activities of the compounds prepared were screened and the results showed that most of such compounds exhibit considerable activities.
Keywords: Hydrazonoyl halides; Heterocycles; 1,3,4-Thiadiazoles; Nitrilimines; Nucleophilic substitution.

102. Functionalized Formazans: A Review on Recent Progress in Their Pharmacological Activities

Ahmad S. Shawali and Nevien A. Samy

This review provides an up to date information about the diverse pharmaceutical activities of formazans. The bibliography includes 97 references which have been published during the period from 1980 to 2013. The covered biological activities of the title compounds include antioxidant, anticonvulsant, therapeutic, anthelmintic, anti-tubercular, antiviral, anti-inflammatory, anticancer, anti-HIV, antimicrobial, antiparkinsonian, cardiovascular and antiproliferative activities.
Keywords: Formazans; Biological activity; Tetrazolium salts; Azo-hydrazones; Heterocycles.

103. Dynamic Potential and Surface Morphology Study of Sertraline Membrane Sensors

M.M. Khater, Y.M. Issa, H.B. Hassib and S.H. Mohammed

Journal of Advanced Research, 6(3): 459-469 (2015) IF: 3

New rapid, sensitive and simple electrometric method was developed to determine sertraline hydrochloride (Ser-Cl) in its pure raw material and pharmaceutical formulations. Membrane sensors based on heteropolyacids as ion associating material were prepared. Silicomolybdic acid (SMA), silicotungstic acid (STA) and phosphomolybdic acid (PMA) were used. The slope and limit of detection are 50.00, 60.00 and 53.24 mV/decade and 2.51, 5.62 and 4.85 µmol L-1 for Ser-ST, Ser-PM and Ser-SM membrane sensors, respectively. Linear range is 0.01–10.00 for the three sensors. These new sensors were used for the potentiometric titration of Ser-Cl using sodium tetraphenylborate as titrant. The surface morphologies of the prepared membranes with and without the modifier (ion-associate) were studied using scanning and atomic force microscopes.
Keywords: Sertraline hydrochloride; Sensors; Sem; Afm; Heteropolyacids.

104. Generation of Defect-Modulated Metal–Organic Frameworks by Fragmented-Linker Co-Assembly of Cpo-27(M) Frameworks

Nadia E. A. El-Gamel

European Journal of Inorganic Chemistry, 2015: 1351-1358 (2015) IF: 2.942

The generation of defect-modulated metal–organic frameworks (MOFs) by the successful stepwise doping of 2-hydroxyterephthalate (BDC-OH) into frameworks of the CPO-27-M type is discussed. The influence of MgII, CoII, and NiII ions on the product formation has been investigated by powder XRD (PXRD), IR spectroscopy, and thermal analysis. To establish the successful incorporation of the fragmented linker molecule, 1H NMR spectra were recorded after the digestion of the MOFs in DCl/[D6]dimethyl sulfoxide. After the incorporation of BDC-OH, microporous structures were generated with reasonable porosity. The morphologies of the reaction products were checked by SEM measurements, and no significant changes to the morphologies were observed after the fragmented-linker doping.
Keywords: Metal–organic frameworks; Microporous materials; Adsorption; Mixed linkers; Defect-modulated MOFs.

105. Protonation and Deprotonation Enthalpies of Alloxan and Implications for the Structure and Energy of its Complexes with Water: A Computational Study

Basmah H. Allehyani, Shaaban A. Elroby, Saadullah G. Aziz and Rifaat H. Hilal

Ournal of Biomolecular Structure and Dynamics, 33: 897-910 (2015) IF: 2.919

The optimized geometries, harmonic vibrational frequencies, and energies of the structures of monohydrated alloxan were computed at the DFT/omega B97X-D and B3LYP/6-311++G** level of theory. Results confirm that the monohydrate exists as a dipolar alloxan-water complex which represents a global minimum on the potential energy surface (PES). Trajectory dynamics simulations show that attempt to reorient this monohydrate, to a more favorable orientation for H-bonding, is opposed by an energy barrier of 25.07 kJ/mol. Alloxan seems to prefer acting as proton donor than proton acceptor. A marked stabilization due to the formation of N-H-OH2 bond is observed. The concerted proton donor-acceptor interaction of alloxan with one H2O molecule does not increase the stability of the alloxan-water complex. The proton affinity of the O and N atoms and the deprotonation enthalpy of the NH bond of alloxan are computed at the same level of theory. Results are compared with recent data on uracil, thymine, and cytosine. The intrinsic acidities and basicities of the four pyrimidines were discussed. Results of the present study reveal that alloxan is capable of forming stronger H-bonds and more stable cyclic complex with water; yet it is of much lower basicity than other pyrimidines.
Keywords: DFT calculations; Dipolar alloxan-water interaction; Gas phase acidities; Hydrogen bond; Alloxan; Trajectory dynamics simulation.

106. Electronic Structure of Alloxan and Its Dimers: Qm/Qd Simulations and Quantum Chemical Topology Analysis

Basmah H. Allehyani, Shaaban A. Elroby, Saadalluh G. Aziz and Rifaat H. Hilal

Journal of Biomolecular Structure & Dynamics, 33: 2121-2132 (2015) IF: 2.919

This study aims to identify the origin of the extra stability of alloxan, a biologically active pyrimidine. To achieve this goal, detailed DFT computations and quantum dynamics simulations have been performed to establish the most stable conformation and the global minimum structure on the alloxan potential energy surface. The effects of the solvent, basis set, and DFT method have been examined to validate the theoretical model adopted throughout the work. Two non-covalent intermolecular dimers of alloxan, the H-bonded and dipolar dimers, have been investigated at the omega B97X-D and M06-2X levels of theory using the triple zeta 6-311++G** to establish their relative stability. Quantum chemical topology features and natural bond orbital analysis (NBO) have been performed to identify and characterize the forces that govern the structures and underlie the extra stability of alloxan.
Keywords: Extra stability; Quantum dynamic simulation; Qtaim; Alloxan; DFT; Quantum chemical topology.

107. Towards Understanding the Decomposition/Isomerism Channels of Stratospheric Bromine Species: Ab Initio and Quantum Topology Study

Saadullah G. Aziz, Abdulrahman O. Alyoubi, Shaaban A. Elroby Osman I. Osman and Rifaat H. Hilal

International Journal of Molecular Sciences, 16: 6783-6800 (2015) IF: 2.862

The present study aims at a fundamental understanding of bonding characteristics of the C-Br and O-Br bonds. The target molecular systems are the isomeric CH3OBr/BrCH2OH system and their decomposition products. Calculations of geometries and frequencies at different density functional theory (DFT) and

Hartree-Fock/MOller-Plesset (HF/MP2) levels have been performed. Results have been assessed and evaluated against those obtained at the coupled cluster single-double (Triplet) (CCSD(T)) level of theory. The characteristics of the C-Br and O-Br bonds have been identified via analysis of the electrostatic potential, natural bond orbital (NBO), and quantum theory of atoms in molecules (QTAIM). Analysis of the electrostatic potential (ESP) maps enabled the quantitative characterization of the Br sigma-holes. Its magnitude seems very sensitive to the environment and the charge accumulated in the adjacent centers. Some quantum topological parameters, namely delta(2), ellipticity at bond critical points and the Laplacian bond order, were computed and discussed. The potential energy function for internal rotation has been computed and Fourier transformed to characterize the conformational preferences and origin of the barriers. NBO energetic components for rotation about the C-Br and O-Br bonds as a function of torsion angle have been computed and displayed.

Keywords: :Bromine bonds; Quantum topology; NBO analysis; DFT calculations; Stratospheric bromine species.

108. Gas-Phase Thermal Tautomerization of Imidazole-Acetic Acid: Theoretical and Computational Investigations

Saadullah G. Aziz, Osman I. Osman, Shaaban A. Elrob and Rifaat H. Hilal

The gas-phase thermal tautomerization reaction between imidazole-4-acetic (I) and imidazole-5-acetic (II) acids was monitored using the traditional hybrid functional (B3LYP) and the long-range corrected functionals (CAM-B3LYP and B97XD) with 6-311++G** and aug-cc-pvdz basis sets. The roles of the long-range and dispersion corrections on their geometrical parameters, thermodynamic functions, kinetics, dipole moments, Highest Occupied Molecular Orbital-Lowest Unoccupied Molecular Orbital (HOMO-LUMO) energy gaps and total hyperpolarizability were investigated. All tested levels of theory predicted the preference of I over II by 0.750-0.877 kcal/mol. The origin of predilection of I is assigned to the H-bonding interaction (n(N8)sigma*(O14-H15)). This interaction stabilized I by 15.07 kcal/mol. The gas-phase interconversion between the two tautomers assumed a 1,2-proton shift mechanism, with two transition states (TS), TS1 and TS2, having energy barriers of 47.67-49.92 and 49.55-52.69 kcal/mol, respectively, and an sp(3)-type intermediate. A water-assisted 1,3-proton shift route brought the barrier height down to less than 20 kcal/mol in gas-phase and less than 12 kcal/mol in solution. The relatively high values of total hyperpolarizability of I compared to II were interpreted and discussed.

Keywords: Imidazole-4-acetic acid; Tautomerization; Long-range; Dispersion.

109. Synthesis, Characterization and Biological Activity of Schiff Basesbased on Chitosan and Arylpyrazole Moiety

Salama, Gamal R. Saad and Magdy W. Sabaa

The Schiff bases of chitosan were synthesized by the reaction of chitosan with 3-(4-substituted-phenyl)-1-phenyl-1H-pyrazole-4-carbaldehyde. The structure of the prepared chitosan derivatives wascharacterized by FT-IR spectroscopy, elemental analysis, and X-ray diffraction studies and thermogravi-metric analysis (TG). The results show that the specific properties of Schiff bases of chitosan can be alteredby modifying the molecular structures with proper substituent groups.TG results reveal that the thermalstability of the prepared chitosan Schiff bases was lower than chitosan. The activation energy of decompo-sition was calculated using Coats–Redfern model. The antimicrobial activity of chitosan and Schiff bases ofchitosan were investigated against Streptococcus pneumonia, Bacillis subtilis, Escherichia coli (as examplesof bacteria) and Aspergillus fumigatus, Geotricum candidum and Syncephalastrum recemosum (as exam-ples of fungi). The results indicated that the antimicrobial activity of the Schiff bases was stronger thanthat of chitosan and was dependent on the substituent group. The activity of un-substituted arylpyra-zole chitosan derivative toward the investigated bacteria and fungi species was better than the otherderivatives.

Keywords: Chitosan schiff bases; Thermal properties; Antimicrobial activity.

110. Synthesis, Characterization and Applications of N-Quaternized Chitosan/Poly (Vinyl Alcohol) Hydrogels

Riham R. Mohamed, Mahmoud H. Abu Elella and Magdy W. Sabaa

Hydrogels composed of N-quaternized chitosan (NQC) and poly(vinyl alcohol) (PVA) in different weight ratios (1:3), (1:1) and (3:1) chemically crosslinked by glutaraldehyde in different weight ratios – 1.0 and 5.0% – have been prepared. The prepared hydrogels were characterized via several analysis tools such as: Fourier transform IR (FTIR), X-ray diffraction (XRD), scanning electron microscope (SEM) and thermogravimetric analysis (TGA). Different applications have been done on NQC/PVA hydrogels including; metal ions uptake, swellability in different buffer solutions (pH: 4, 7 and 9), swellability and degradation studies in simulated body fluid (SBF) solutions and antimicrobial activity towards bacteria and fungi. The results indicated that crosslinked NQC/PVA hydrogels with glutaraldehyde (GA) are more thermallystable than non crosslinked hydrogels, NQC/PVA hydrogels swell highly in different buffer solutions as PVA content increases and the antimicrobial activity of NQC/PVA hydrogels is higher than NQC itself.

Keywords: Hydrogel; Crosslinked; Simulated body fluid; Swellability; Metal ions uptake.

111. Corrosion Resistance of Ti Modified by Chitosan–gold Nanoparticles for Orthopedic Implantation

R.A. Farghali, A.M. Fekry, Rasha A. Ahmed, H.K.A. Elhakim

Highly uniform bionanocomposite film composed of chitosan (CS) and gold nanoparticles (AuNPs) was synthesized

successfully by electrodeposition method. The influence of AuNPs/CS bionanocomposite film on corrosion resistance of Ti was investigated. Surface morphology and compositional properties of the bionanocomposite were analyzed by scanning electron microscope (SEM), energy dispersive X-ray analysis (EDX), and X-ray photoelectron spectroscopy (XPS). Moreover, cyclic voltammetry (CV), open-circuit potential measurements (OCP), electrochemical impedance spectroscopy (EIS) and potentiodynamic polarization (Rp) were used to examine the corrosion behavior in Hanks' solution. In comparison with Ti, Nyquist and Bode plots displayed higher impedance values and phase angles for AuNPs/CS biocomposite denoting a more protective passive film on Ti with inhibition efficiency (IE%) of 98%. An electric equivalent circuit with three time constants was modeled for the bionanocomposite. In addition, the antibacterial effect revealed the high efficiencies of the bionanocomposite film for inhibiting bacterial growth. The combination of the high biocompatibility of chitosan and strong adsorption ability of AuNPs make AuNPs/CS bionanocomposite promising candidate for modifying biomaterial surfaces for medical implantation applications.

Keywords: Chitosan; Aunps; Titanium.

112. Electrochemistry of Glucose at Gold Nanoparticles Modified Graphite/ Srpdo3 Electrode– Towards A Novel Non-Enzymatic Glucose Sensor

Ekram H. El-Ads, Ahmed Galal and Nada F. Atta

An enzyme-free voltammetric glucose sensor based on gold nanoparticles modified graphite/SrPdO3 electrode is presented. The proposed glucose sensor showed prominent electrocatalytic activity toward the glucose oxidation in 0.1 mol L1 NaOH. An effective synergism was achieved between the SrPdO3 perovskite and the gold nanoparticles film resulting in higher current response for glucose than the sum of the individual current values for SrPdO3 and gold nanoparticles. The nanocomposite provided plenty of active sites for the direct oxidation of glucose resulting in excellent performance in terms of highly reproducible response, high sensitivity, wide linearity and applicability in real urine samples and blood serum. The non-enzymatic glucose sensor exhibited good linear range in the concentration range from 100 lmol L1 to 6 mmol L1 with a detection limit of 10.1 lmol L1. Moreover, the interferences of ascorbic acid, uric acid, dopamine, paracetamol and chloride can be avoided at the proposed sensor presenting a highly selective non-enzymatic glucose sensor. In addition, the proposed sensor offered unique long term stability due to the intrinsic effects of the proposed nanocomposite.

Keywords: Perovskite; Non-enzymatic glucose sensor; Gold nanoparticles; Graphite electrode; Selectivity.

113. Microwave Irradiated Ni–MnOx/C as An Electrocatalyst for Methanol Oxidation in KOH Solution for Fuel Cell Application

R.M. Abdel Hameed

Ni–MnOx/C electrocatalyst was synthesized by the reduction of nickel precursor salt on MnOx/C powder using NaBH4 and the deposition process was motivated with the aid of microwave irradiation. Finer nickel nanoparticles were detected in Ni–MnOx/C using transmission electron microscopy with a lower particle size of 4.5 nm compared to 6 nm in Ni/C. Cyclic voltammetry, chronoamperometry and electrochemical impedance spectroscopy (EIS) were applied to study the electrocatalytic activity of Ni–MnOx/C for methanol oxidation in 0.5 M KOH solution. The presence of 7.5 wt.% MnOx in Ni–MnOx/C enhanced the oxidation current density by 1.43 times. The catalytic rate constant of methanol oxidation at Ni–MnOx/C was calculated as 3.26×103 cm3 mol-1 s-1. An appreciable shift in the maximum frequency at the transition from the resistive to capacitive regions to a higher value in Bode plots of Ni–MnOx/C was shown when compared to Ni/C. It was accompanied by lowered phase angle values. The lowered Warburg impedance value (W) of Ni–MnOx/C at 400 mV confirmed the faster methanol diffusion rate at its surface.

Keywords: Nickel; Manganese oxide; Microwave irradiation; Alkaline medium; Fuel cells.

114. Promotion Effect of Manganese Oxide on the Electrocatalytic Activity of Pt/C for Methanol Oxidation in Acid Medium

R.M. Abdel Hameed, Amani E. Fetohi, R.S. Amin and K.M. El-Khatib

The modification of Pt/C by incorporating metal oxides for electrocatalytic oxidation of methanol has gained major attention because of the efficiency loss during the course of long-time operation. This work describes the preparation of Pt–MnO2/C electrocatalysts through a chemical route using ethylene glycol or a mixture of ethylene glycol and sodium borohydride as a reducing agent. The crystallite structure and particle size of synthesized electrocatalysts are determined using X-ray diffraction (XRD) and transmission electron microscopy (TEM). The addition of MnO2 improves the dispersion of Pt nanoparticles. The electrocatalytic activity of Pt–MnO2/C towards methanol oxidation in H2SO4 solution is investigated using cyclic voltammetry and electrochemical impedance spectroscopy. The onset potential value of methanol oxidation peak is negatively shifted by 169 mV when MnO2 is introduced to Pt/C. Moreover, the charge transfer resistance value at Pt–MnO2/C is about 10 times as low as that at Pt/C. Chronoamperometry and chronopotentiometry show that CO tolerance is greatly improved at Pt–MnO2/C. The increased electrocatalytic activity and enhanced ability to clean platinum surface elect manganese oxide as a suitable promoter for the anode performance in direct methanol fuel cells (DMFCs).

Keywords: Platinum; Manganese oxide; Reducing agent; Chemical synthesis; Fuel cells.

115. Effect of Various De-anodizing Techniques on the Surface Stability of Non-colored and Colored Nanoporous AAO Films in Acidic Solution

Ahmed M. Awad, Omnia S. Shehata and Fakiha El-Taib Heakal

tAnodic aluminum oxide (AAO) is well known as an important nanostructured material, and a useful tem-plate in the fabrication of nanostructures. Nanoporous anodic alumina (PAA) with high open porositywas prepared by adopting three de-anodizing regimes following the first anodizing step and precedingthe second one. The de-anodizing methods include electrolytic etching (EE) and chemical etching usingeither phosphoric acid (PE) or sodium hydroxide (HE) solutions. Three of the obtained AAO samples wereblack colored by electrodeposition of copper nanoparticles in their pores. Electrochemical impedancespectroscopy (EIS) and potentiodynamic polarization techniques were used to characterize the electro-chemical performance of the two sets of the prepared samples. In general, the data obtained in aggressiveaerated 0.5 M HCl solution demonstrated dissimilar behavior for the three prepared samples despite thatthe second anodizing step was the same for all of them. The data indicated that the resistance and thick-ness of the inner barrier part of nano-PAA film, are the main controlling factors determining its stability.On the other hand, coloring the film decreased its stability due to the galvanic effect. The difference in theelectrochemical behavior of the three colored samples was discussed based on the difference in both thepore size and thickness of the outer porous part of PAA film as supported by SEM, TEM and cross-sectionalmicrographs. These results can thus contribute for better engineering applications of nanoporous AAO.

Keywords: Nonporous AAO; Black colored films; Anodization; De-anodizing techniques; Electrochemical impedance spectroscopya.

116. Bio-Based Soft Elastomeric Capacitor for Structural Health Monitoring Applications

Sari Kharroub, Simon Laflamme, Samy Madbouly and Filippo Ubertini

Recent advances in flexible electronics have enabled the development of large-area electronics, which are typically fabricated from petroleum-based polymers. With the rapidly growing market of flexible electronics and sensors, there is a pressure to move toward environmentally friendly products. In this article, a bio-based polyurethane soft elastomeric capacitor for structural health monitoring applications is presented. The sensor's dielectric is fabricated using castor oil– based waterborne polyurethane, mixed with titanium dioxide, which replaces petroleum-based dielectric materials (e.g. styrene-ethylene/butylene-styrene) previously used by the authors. A critical advantage of the proposed castor oil–based polyurethane over styrene-ethylene/butylene-styrene is the environmentally friendly nature of the bio-based polymer and water-based fabrication process of the dielectric that limits the use of solvents. Static characterization demonstrates the linearity of the sensor and its ability to transduce local strain of large surfaces into change in capacitance. Material test results show good physical and chemical properties, despite a decay of the dielectric that occurs after the first 16 days of fabrication.

Keywords: Structural health monitoring; Strain monitoring; Capacitive sensor; Soft elastomeric capacitor; Bio-based sensor; Stretchable sensor; Dielectric polymer; Large-area electronics.

117. Discrepancies in the Reactivity Pattern of Azaenamines Towards Cinnamonitriles: Synthesis of Novel Aza-Steroid Analogues

Said A.S. Ghozlan, Amr M. Abdelmoniem, Holger Butenschon and Ismail A. Abdelhamid

Azaenamine incorporating pyrazole-4-carboxylate is prepared and allowed to react with a,β-substituted nitriles. A new reactivity pattern was observed leading to the formation of substituted pyrazolo[4',3'-5,6] pyrimido[2,1-a]phthalazine-9-carbonitriles, which can be considered as aromatic aza-steroid analogues.

Keywords: Azaenamine; a,β-Substituted nitriles; New reactivity pattern; Steroidal phenanthrenes; Michael addition.

118. Synthesis, Anti-Inflammatory and Anti-Ulcer Evaluations of Thiazole,Thiophene, Pyridine and Pyran Derivatives Derived from Androstenedione

Rafat M. Mohareb, Mayssoune Y. Zaki and Nermeen S. Abbas

The reaction of androstenedione with bromine gave the 16-bromo derivative 2. The latter reacted with either cyanothioacetamide or thiourea to give the 2-cyanomethylthiazole derivative 4 and the 2-aminothiazole derivative 13. Compound 4 and 13 were used underwent some condensation, coupling and heterocyclization reactions to give thiophene, pyridine and pyran derivatives. The anti-inflammatory and anti-ulcer evaluations of the newly synthesized products were evaluated and the results showed that 23f showed the maximum antiulcer activity. In addition, toxicity of the most active compounds was studied against shrimp larvae and showed that compounds 2, 23c and 23f showed non-toxicity against the tested organisms.

Keywords: Androstenedione; Thiazole; Thiophene; Anti-inflammatory; Anti-ulcer.

119. Renewable Polymers Prepared from Vanillin and its Derivatives

Chaoqun Zhang, Samy A. Madbouly and Michael R. Kessler

Vanillin and vanillyl alcohol are modifi ed into methacrylated derivatives, which are subsequently polymerized by a free-radical process. The rheokinetics of the polymerization are investigated to determine the cure behavior and optimize the polymerization conditions for these two monomers. The effects of both structure and functionalities of the vanillin-based monomers on the thermomechanical properties of the resulting polymers are investigated and discussed. The high cross-linking density of the polymers from methacrylated vanillyl alcohol results in higher storage modulus and glass transition temperature, as well as better thermal resistance, than seen in polymers from methacrylated vanillin. These properties, combined with methacrylated vanillyl alcohol's low viscosity at room temperature, make it a promising bio-based reactive diluent for unsaturated polyester resins and vinyl esters.

120. Supramolecular Structure, Molecular Docking and Thermal Properties of Azo Dye Complexes

A.Z. El-Sonbati, G.G. Mohamed, A.A. El-Bindary,W.M.I. Hassan, M.A. Diab, Sh.M. Morgan and A.K. Elkholy

The complexes of [Pt(Ln)2] and [M(Ln)2(OH2)2]Cl (M= Rh(III) and Ir(III)), where Ln = monobasic bidentate 5- (4-derivatives phenylazo)-2-thioxo-4-thiazolidinone (HLn) have been prepared and characterized by elemental analyses, conductivity measurements, magnetic susceptibility measurements and spectroscopic (IR, Uv.-Vis. and 1HNMR) studies. The X-ray diffraction (XRD) pattern of the ligand (HL2) is polycrystalline nature. The molecular, electronic structures and quantum chemical parameters of the ligands (HLn) were studied. Molecular docking was used to predict the binding between ligands (HLn) and the receptor of breast cancer 3HB5 oxidoreductase. The Rh(III) and Ir(III) complexes are six-coordinate distorted octahedral, whereas Pt(II) is four coordinated. The ligand coordinates through the azo dye nitrogen atom and enolic oxygen atom after deprotonation. The molar conductivities showthat all the complexes of Pt(II) are non-electrolyteswhile Rh(III) and Ir(III) complexes are electrolytic nature. The ligands field parameters were calculated using various energy level diagrams.

Keywords: Azo rhodanine derivatives; Molecular docking; Pt(II)/Rh(III) and Ir (III) complexes; TGA; Quantum chemical parameters.

121. Extractive Spectrophotometric Method for Determination of Cadmium (II) in Different Water Sources

G.G. Mohamed, A.A. El-Bindary, M.S. Rizk, M.A. Diab, A.Z. El-Sonbati and M.S.H. Sadek

The main task of this research article is to determine Cd(II) ion in pure and indifferentwater samples. Themethod is fast, cost-effective and reliable where commercially available and cheap spectrophotometric reagents were utilized in this work. The method is based on the formation of colored ternary complexes and improved using cetyl trimethyl ammonium bromide (CTAB) as cationic surfactant which interacts with the complexes to build up true ternary complexes. The spectrophotometric method depends on determination of Cd(II) ion using 1,10-phenanthroline (PHR) and eriochrome black T (EBT) or tartrazine (TZ) mixed reagents. The most suitable conditions for determination of Cd(II) ion and the parameters affecting the reactions including pH, time, temperature, stoichiometric ratios and reagents concentrations are optimized. The effect of different interfering ions is studied together with the suitable masking agents. The developed method is used for the determination of Cd(II) ion in the presence of CTAB in different types of water samples (ground and polluted industrial waste water). The results obtained are found to be comparable with those obtained using inductively coupled plasma. The solid ternary complexes were synthesized and

characterized using elemental, thermal analyses, IR and molar conductance measurements. They found to have the formula [Cd(PHR)(EBT)(H2O)] and [Cd(PHR)(TZ)]Cl with octahedral and square planar geometries.

Keywords: Spectrophotometry; Cd (II) complexes; Polluted waste water.

122. Geometrical Structure, Molecular Docking, Potentiometric and Thermodynamic Studies of 3-Aminophenol Azodye and its Metal Complexes

A.Z. El-Sonbati, G.G. Mohamed, A.A. El-Bindary,W.M.I. Hassan and A.K. Elkholy

The proton–ligand dissociation constants of 4-(2,3-dimethyl-1-phenylpyrazol-5-one azo)-3-aminophenol (HL) and its metal stability constants with Mn(II), Co(II), Ni(II) and Cu(II) ions have been determined using potentiometric studies. Themolecular structure of the ligand is optimized theoretically and the quantumchemical parameters are calculated. The proton–ligand dissociation constants of HL and its metal stability constants with Mn(II), Co(II), Ni(II) and Cu(II) have been determined potentiometrically. The potentiometric studieswere carried out in 0.1 M KCl and 20% (by volume) DMF–water mixture. At constant temperature the stability constants of the formed complexes decrease in the order of Cu(II) N Ni(II) N Co(II) NMn(II). The effect of temperature was studied at 298, 308 and 318 K and the corresponding thermodynamic parameters (ΔG, ΔH and ΔS) were derived and discussed. The dissociation process is non-spontaneous, endothermic and entropically unfavorable. The formation of the metal complexes has been found to be spontaneous, endothermic and entropically favorable. Molecular docking was used to predict the binding between azodye ligand and the receptor of prostate cancer mutant 2q2k-Hormon and receptor of breast cancer mutant 3hb5-Oxidoreductase.

Keywords: 3-Aminophenol azodye; Potentiometry study; Stability constants; Thermodynamics parameters; Quantum chemical parameters; Molecular docking.

123. Novel Pyrrole Derivatives as Selective CHK1 Inhibitors: Design, Regioselective Synthesis and Molecular Modeling

Taha M. A. Eldebss, Sobhi M. Gomha, Mohamed M. Abdulla and Reem K. Arafa

An efficient synthesis of hitherto unreported 3-heteroaryl-pyrroles was described via regioselective 1,3-dipolar cycloaddition reactions of enaminone 2 or 3 with nitrilimines 5a–j to afford the corresponding pyrazole derivatives 7a–j. Hydrazinolysis of 7a–f yielded the respective pyrazolo[3,4-d] pyridazines 10a–f. Furthermore, pyrrole analogs substituted on the 3-position with pyranone (14), benzofuran (16) or naphthofuran (18) were also synthesized. The structures of the synthesized compounds were determined by spectral, elemental analyses and alternative syntheses wherever possible. The synthesized compounds were evaluated for their protein kinase inhibitory activities against 25 kinases belonging to 4 kinase groups viz. AGC (5 kinases),

CAMK (5 kinases), CMGC (4 kinases) and TK (11 kinases). While the tested compounds were found to be good inhibitors of VEGFR-2 and EGFR, exhibiting low micromolar IC50 values, they were selectively more potent against CHK1 eliciting a potent inhibitory effect with IC50 values in the submicromolar range. Finally, docking studies were performed to interpret the possible binding mode of the target compounds with CHK1.
Keywords: Pyranone; Benzofuran; Naphthofuran1,3-dipolar cycloaddition; CHK1.

124. The Effect of Lateral Methyl Substitution on the Mesophase Behaviour of Aryl 4-Alkoxyphenylazo Benzoates

Magdi M. Naoum, Abdelgawad A. Fahmi, Nagwa H.S. Ahmed and Gamal R. Saad

In order to investigate the effect of lateral methyl substitution on the mesophase behaviour of the previously investigated laterally neat 4-substituted phenyl 4'-(4"-alkoxyphenylazo) benzoates (In_a–e), five homologous series of 4-substituted phenyl 4'-(3"-methyl-4"-alkoxyphenylazo) benzoates (IIna–e) were prepared in which, within each homologous series, the length of the terminal alkoxy group varies between 8, 10, 12, 14, and 16 carbons, while the other terminal substituent, X, is a polar group that alternatively changed between the electron-donating CH3O and CH3 groups, and the electron-withdrawing Br and CN groups, in addition to the unsubstituted analogue. Two other isomeric series (IIIna–e) were also prepared in which the methyl group is laterally attached, this time, to position 2 of the same ring, aiming to investigate the effect of the different orientation of the methyl groups on the mesophase behaviour of the produced isomers. The results were discussed in terms of steric, mesomeric, and polarisability effects.
Keywords: Phenylazo phenyl benzoates; Lateral-methyl substitution; Mesophase behavior; Polarisability anisotropy.

125. The Effect of Inversion of the Ester Group on the Mesophase Behaviour of Some Azo/Ester Compounds

Magdi M. Naoum, Abdelgawad A. Fahmi, Nagwa H.S. Ahmed and Gamal R.Saad

Five homologous series of 4-substituted phenyl 4'-(4"-alkoxy phenylazo) benzoates (Ina--e) were prepared in which, within each homologous series, the length of the terminal alkoxy group varies between 8, 10, 12, 14 and 16 carbons, while the other terminal substituent, X, is a polar group that alternatively changed from CH3O, CH3, H, Br, and CN groups. Compounds prepared were characterised by infrared, mass, and H1-NMR spectroscopy and their mesophase behaviour investigated by differential scanning calorimetry (DSC) and polarised light microscopy (PLM). The results were discussed in terms of mesomeric and polarisability effects. Only for the lower group of compounds, I8a-e, that showed a nematic phase, the nematic-to-isotropic transition temperatures (TN–I) were successfully correlated to the polarisability anisotropy of bonds to the substituent X. A comparative study was made between the investigated

compounds and two previously prepared isomeric groups. In the first group of isomers, 4-(4'alkoxy phenylazo) phenyl 4"-substituted benzoates (IIna–e), the ester groups are inverted. While in the second, 4-(4'-substituted phenylazo) phenyl 4"-alkoxy benzoates (IIIna–e), two modifications were made, inversion of the COO group, and exchange of the two wing substituents
Keywords: Phenylazo phenyl benzoates; Mesophase behavior; Inversion of ester group; Polarisability anisotropy.

126. Mesophase Stability in Binary Mixtures of Monotropic Nematogens

H.A. Ahmed

Binary phase diagrams were constructed from laterally substituted methyl azo/ester derivatives, namely 4-(4″-substituted phenylazo)-3-methyl phenyl-4″-alkoxy benzoates (In_a–d). In this group of compound the unsubstituted and chloro-substituted derivatives possess the nematic phase monotropically, while the nitro and methyl analogues are enantiotropically nematogenic. The binary phase diagrams constructed were made once from the monotropic nematogens with each other, and another with the enantiotropic nematogens. In both the cases enantiotropic nematic phase was observed that covers a wide range of composition. The mesophase behaviour of all binary mixtures was investigated by differential scanning calorimetry (DSC) and polarised light microscopy (PLM). The nematic phase was exhibited in all binary mixtures. Independent of the alkoxy chain length, the entropy change, ΔSN_{-I} of the N–I transition of pure components was found to vary irregularly with the anisotropy of polarisability (Δa_X) of the polar substituent, X.
Keywords: 4-(4'-Substituted phenylazo)-3-methyl phenyl-4″-alkoxy benzoates; Phase transitions; Binary phase diagrams; Anisotropy of polarisability.

127. Polarity and Steric Effect of the Lateral Substituent on the Mesophase Behaviour of Some Newly Prepared Liquid Crystals

Magdi M. Naoum, Nadia H. Metwally, Manal M. Abd eltawab and Hoda A.Ahmed

Eight homologous series of 2- (or 3-) substituted phenyl 4'-(4"-alkoxy phenylazo) benzoates (In_a–h) were prepared in which, within each homologous series, the length of the terminal alkoxy group varies between 6, 8, 10 and 12 carbons, while the other substituent, X, is a laterally attached polar group that alternatively changed from CH3, H, F, Br and CN. Compounds prepared were characterised by infrared and ^{1}H-NMR spectroscopy, and their mesophase behaviour investigated by differential scanning calorimetry and identified by polarised light microscopy. The results were discussed in terms of polarity and steric effects. The stability of the mesophase was correlated once with the dipolar anisotropy of the whole molecule and another with the dipolar anisotropy of the substituent, X. A comparative study was made between the investigated compounds and their previously prepared linear 4-substituted isomers, namely 4-substituted phenyl 4'-(4"-alkoxy phenylazo) benzoates (In_i–k).

128. Mesophase Behaviour of Azobenzene-based Angular Supramolecular Hydrogen-Bonded Liquid Crystals

H.A. Ahmed and M.M. Naoum

New types of angular 1:1 hydrogen-bonded supramolecular complexes via hydrogen-bond formation between 4-alkoxyphenylazo benzoic acids (In) and 4-(3'-pyridylazo)-4"-alkoxybenzoates (IIm) with various alkoxy chains (from 6 to 16 carbons) were prepared and investigated for their mesophase behaviour by differential scanning calorimetry (DSC) and polarised-light microscopy (PLM). All prepared homologues were found to be dimorphic, possessing smectic C and nematic mesophases. The formation of 1:1 hydrogen-bonded supramolecular liquid crystals (LCs) complexes was confirmed by FTIR and UV'visible (UV'vis) absorption spectroscopy. The study revealed that nematic transition enhancement (ΔT) decreases with the increase of the alkoxy chain length on the base complement, while it increases with the increase of the chain attached to the acid complement of the complex, that is the stability of the nematic phase is more dependent on the length of the acid component.

Keywords: Angular supramolecular liquid crystals; Hydrogen bonding; 4-Alkoxyphenylazo benzoic acids; Nematic stability.

129. Mesophase Behaviour of Laterally Di-Fluoro-Substituted Four-Ring Compounds

H.A. Ahmed and G.R. Saad

Four new groups of the di-fluoro-substituted 4-(2'-(or 3')-fluoro phenylazo)-2-(or 3-) fluoro phenyl-4"-alkoxyphenylazo benzoates (I$_n$–IV$_n$) were prepared and investigated for their mesophase behaviour. An alkoxy group of variable chain length (n = 6, 10 and 14 carbons) is attached to the terminal phenylazo benzoate moiety, and two lateral fluoro substituents are attached individually with different orientations to the other two adjacent rings. The molecular structures of the prepared compounds were confirmed by Fourier transform infrared spectroscopy and ^{1}H NMR spectroscopy. The study aims to investigate the steric effect of the spatial orientation and relative positions of the two lateral fluorine atoms on the mesomorphic properties in their pure states. The mesophase behaviour was investigated via differential scanning calorimetry and mesophases were identified by polarised light microscopy. The investigation shows that these compounds exhibit high enantiotropic mesophases (SmC and N) and broad mesophase temperature range. The type and stability of the mesophase depends on the length of the terminal alkoxy chain and the position the two fluoro substituents. A comparison between these investigated compounds with their corresponding three-ring analogues was discussed.

Keywords: Lateral fluorine; Mesophase behavior; Four-ring; Azo/ester compounds.

130. Novel 4-Heteroaryl-Antipyrines as DPP-IV Inhibitors

Sobhi M. Gomha, Taha M. A. Eldebss, Mohamed G. Badrey, Mohamed M. Abdulla and Abdelrahman S. Mayhoub

Type 2 diabetes mellitus is a vast growing progressive disease that almost affects one person among every twelve globally. Regardless the availability of wide variety of oral hypoglycemics, only one-third of patients achieves proper glycemic control. With the advantage of the low risk of hypoglycemia, DPP-IV attracted the attention of medicinal chemists as a new target for oral hypoglycemics. In this report, a lead compound 1, with antipyrine scaffold, was obtained, and its binding mode was calculated. Several derivatives with bridged nitrogenous heterocycles have been synthesized via multicomponent reaction under controlled microwave heating conditions. The antidiabetic activity versus DPP-IV protein was evaluated and compared with sitagliptin Compounds with smaller- or medium-sized nitrogenous bridges were comparable with sitagliptin in terms of DPP-IV inhibitory activity, potentially via targeting Glu203 and Glu204. The oral hypoglycemic activities of compounds with submicromolar IC50 values were further evaluated using diabetic mouse model.

Keywords: Antidiabetic activities; Enaminones; Glp-1, microwave irradiation; Multicomponent reactions.

131. Electroactivity Regeneration of Sulfur-Poisoned Platinum Nanoparticle-Modified Glassy Carbon Electrode at Low Anodic Potentials

M. I. Awad, M. M. Saleh and T. Ohsaka

This paper focuses on the oxidative regeneration of the electroactivity of sulfur-poisoned polycrystalline Pt (poly- Pt) electrode and Pt nanoparticles-modified glassy carbon (nano-Pt/GC) electrode in O2-saturated 0.1 MHClO4. Recovery of the electroactivity is examined using oxygen reduction reaction (ORR) as a probing reaction. Recovery of the poisoned electrodes is attempted by applying several potential cycles in the range of 0.06~1.06 V (reversible hydrogen electrode,RHE) for avoiding the dissolution of platinumwhen the potential is excursed to higher positive values. The recovery of the poisoned electrodes is significantly affected by the dissolved oxygen, i.e., the recovery is more effective under O2 atmosphere than under N2 atmosphere. Moreover, the recovery performance of the nano-Pt/GC electrode is more considerable than that of the poly-Pt electrode. The easier recovery of the former electrode is attributed to the relative small ratio of Pt(100) facet as revealed from the facet-dependent voltammetric behavior for the oxidation of formic acid at the Pt electrode in HClO4 solution and from the X-ray diffraction spectrum of the nano-Pt/GC electrode. Interestingly, controlling the potential range for recovery and the number of potential cycles was found to lead to a remarkable electrocatalytic activity of the electrodes for the ORR. A plausible explanation for the obtained results is given in view of the voltammetric measurements.

Keywords: So2 tolerance; Platinum nanoparticles; Oxygen reduction; Adsorption; Rrde.

132. Design and Synthesis of Imidazopyrazolopyridines as Novel Selective COX-2 Inhibitors

Mohamed G. Badrey, Hassan M. Abdel-Aziz, Sobhi M. Gomha, Mohamed M. Abdalla and Abdelrahman S. Mayhoub

The usefulness of non-steroidal anti-inflammatory drugs (NSAIDs) is hampered by their gastrointestinal side effects. Non-selective cyclooxygenases inhibitors interfere with both COX-1 and COX-2 isozymes. Since COX-1 mediates cytoprotection of gastric mucosa,its inhibition leads to the undesirable side effects. On the other hand, COX-2 is undetectable in normal tissues and selectively induced by inflammatory stimuli. Therefore, it is strongly believed that the therapeutic benefits derive from inhibition of COX-2 only. The presence of a strong connection between reported COX-2 inhibitors and cardiac toxicity encourages medicinal chemists to explore new scaffolds. In the present study, we introduced imidazopyrazolopyridines as new potent and selective COX-2 inhibitors that lack the standard pharmacophoric binding features to hERG. Starting from our lead compound 5a, structure-based drug-design was conducted and more potent analogues were obtained with high COX-2 selectivity and almost full edema protection, in carrageenan-induced edema assay, in case of compound 5e. Increased bulkiness around imidazopyrazolopyridines by adding a substituted phenyl ring(s) afforded less active compounds
Keywords: Aminopyrazolopyridine; Anti-inflammatory; Cyclooxygenase; Hydrazonyl halides; Selective inhibitors.

133. Synthesis of Some New Thieno[2,3-B]Pyridines, Pyrimidino[4'',5'':4,5]Thieno[2,3-B]Pyridine and Pyridines Incorporating 5-Bromobenzofuran-2-Yl Moiety

Nadia Abdelhamed Abdelriheem, Sayed Abdel-Kader Ahmad and Abdou Osman Abdelhamid

2-Sulfanyl-6-(2-thienyl)pyridine-3-carbonitrile, 1-Amino-6-(5-bromo-benzofuran-2-yl)-2-oxo-1,2-dihydro-pyridine-3-carbonitrile, thieno[2,3-b]pyridins, pyrimidino[4',5':4,5] thieno[2,3-b]pyridine, quinazoline and carbamate derivatives were synthesized from sodium 3-(5-bromobenzofuran-2-yl)-3-oxoprop-1-en-1-olate with. The newly synthesized compounds were elucidated by elemental analysis, spectral data, and alternative synthesis whenever possible and chemical transportation.
Keywords: Thieno[2,3-B]Pyridines; Pyrimidino[4',5':4,5] Thieno [2,3-B] Pyridine; Pyridines.

134. Synthesis and Cytotoxicity Evaluation of Some Novel Thiazoles, Thiadiazoles, and Pyrido[2,3-D][1,2,4]Triazolo[4,3-A]Pyrimidin-5(1H)-Ones Incorporating Triazole Moiety

Sobhi M. Gomha, Sayed A. Ahmed and Abdou O. Abdelhamid

Reactions of hydrazonoyl halides and each of methyl 2-(1-(5-methyl-1-phenyl- 1H-1,2,3-triazol-4-yl)ethylidene)hydrazine-1-carbodithioate and 2-(1-(5-methyl-1-phenyl- 1H-1,2,3-triazol-4-yl)ethylidene)hydrazine-1-carbothioamide afforded 2-(1-(5-methyl-1- phenyl-1H-1,2,3-triazol-4-yl)ethylidene)hydrazono)-3-phenyl-5-substituted-2,3-dihydro- 1,3,4-thiadiazoles and 5-(4-substituted) diazenyl) -2-(2-(1-(5-methyl-1-phenyl-1H-1,2,3-triazol-4-yl)ethylidene)hydrazinyl)-4-arylthiazoles, respectively. Analogously, the reactions of hydrazonoyl halides with 7-(5-methyl-1-phenyl-1H-1,2,3-triazol-4-yl)-5-phenyl-2,3-dihydropyrido[2,3-d]pyrimidin-4(1H)-one gave 3-(4-substituted)-8-(5-methyl-1- phenyl-1H-1,2,3-triazol-4-yl)-6-phenyl-1-arylpyrido[2,3-d]-[1,2,4]-triazolo-[4,3-a]pyrimidin- 5(1H)-ones in a good yield.

The structures of the newly synthesized were elucidated via elemental analysis, spectral data and alternative synthesis routes whenever possible. Twelve of the newly synthesized compounds have been evaluated for their antitumor activity against human breast carcinoma (MCF-7) and human hepatocellular carcinoma (HepG2) cell lines. Their structure activity relationships (SAR) were also studied. The 1,3,4-thiadiazole derivative 9b (IC50 = 2.94 µM) has promising antitumor activity against the human hepatocellular carcinoma cell line and the thiazole derivative 12a has promising inhibitory activity against both the human hepatocellular carcinoma cell line and the breast carcinoma cell line (IC50 = 1.19, and 3.4 µM, respectively).
Keywords: 1,2,3-Triazoles; Thiazoles; Thiadiazoles; Pyrido[2,3-D][1,2,4]triazolo[4,3-A].

135. Utility of 3-Acetyl-6-Bromo-2H-Chromen-2-One for the Synthesis of New Heterocycles as Potential Antiproliferative Agents

Sobhi M. Gomha, Yasser H. Zaki and Abdou O. Abdelhamid

Coumarin derivatives containing pyrazolo[1,5-a]pyrimidine, tetrazolo[1,5-a]pyrimidine, imidazo[1,2-a]pyrimidine, pyrazolo[3,4-d]pyrimidine, 1,3,4-thiadiazoles and thiazoles were synthesized from 6-bromo-3-(3-(dimethylamino)acryloyl)-2H-chromen-2-one, methyl 2-(1-(6-bromo-2-oxo-2Hchromen- 3-yl)ethylidene)hydrazine carbodithioate, 2-(1-(6-bromo-2-oxo-2H-chromen-3-yl)ethylidene) hydrazine carbothioamide and each of heterocyclic amine, hydrazonoyl chlorides and hydroximoyl chlorides.
The structures of the newly synthesized compounds were elucidated on the basis of elemental analysis, spectral data, and alternative synthetic routes whenever possible. Moreover, selected newly synthesized products were evaluated for their antitumor activity against a liver carcinoma cancer cell line (HEPG2-1).
The results revealed that pyrazolo[1,5-a]pyrimidine 7c, thiazole 23g and 1,3,4-thiadiazole 18a (IC50 = 2.70 ± 0.28, 3.50 ± 0.23 and 4.90 ± 0.69 µM, respectively) have promising antitumor activity against liver carcinoma (HEPG2-1) while most of the tested compounds showed moderate activity.
Keywords: Pyrazolo [1,5-A] Pyrimidine; Tetrazolo[1,5-A]Pyrimidine; 1,3,4-Thiadiazoles; Thiazoles.

Basic Science Sector

136. Uses of 3-(2-Bromoacetyl)-2H-Chromen-2-One in the Synthesis of Heterocyclic Compounds Incorporating Coumarin: Synthesis,Characterization and Cytotoxicity

Rafat M. Mohareb and Nadia Y. Megally Abdo

In this work, 3-bromoacetylcoumarin was used as the key starting material for the synthesis of pyran, pyridine, thiophene, thiazole and pyrazole derivatives through its reaction with different reagents. The structures of the newly synthesized compounds were confirmed on the basis of their spectral data and elemental analyses. All of the synthesized compounds were screened for their in vitro anticancer activity against six human cancer cell lines, namely: human gastric cancer (NUGC), human colon cancer (DLD1), human liver cancer (HA22T and HEPG2), nasopharyngeal carcinoma (HONE1), human breast cancer (MCF) and normal fibroblast cells (WI38). The IC50 values (the sample concentration that produces 50% reduction in cell growth) in nanomolars (nM)) showed most of the compounds exhibited significant cytotoxic effect. Among these derivatives, compound 6d showed almost equipotent cytotoxic activity against NUGC (IC50 = 29 nM) compared to the standard CHS 828 (IC50 = 25 nM).
Keywords: Coumarin; Pyran; Pyridine; Thiazole; Pyrazole; Cytotoxicity.

137. Synthesis and Characterization of Poly(2,6-Dimethyl-4-Phenyl-1,4-Dihydropyridinyl)Arenes as Novel Multi-Armed Molecules

Ismail A. Abdelhamid, Ahmed F. Darweesh and Ahmed H. M. Elwahy

A new series of poly(2,6-dimethyl-4-phenyl-1,4-dihydropyridinyl)arenes were synthesized in good yields using a one-pot, acid-catalyzed cyclocondensation reaction of the appropriate poly(aldehydes) with 3-aminobut-2-enenitrile in acetic acid at reflux.
Keywords: Poly(aldehydes); 3-Aminobut-2-enenitrile; Poly-dihydropyridines; Cyclocondensation; Alkylation.

138. High Performance Anti-Corrosive Powder Coatings Based on Phosphate Pigments Containing Poly(O-Aminophenol)

M.A. Abd El-Ghaffar, N.A. Abdel-Wahab, M.A. Sanad and M.W. Sabaa

Great progress has been devoted recently in the applications of conducting polymers and their composites in corrosion protection of metals by coatings. The ultimate goal of this study is to formulate anti-corrosive hybrid epoxy/polyester and polyester powder coating composites based on phosphate pigments containing poly-o-aminophenol for corrosion protection of steel. The formulations were prepared in two steps. The first step involved In situ emulsion polymerization of o-aminophenol in presence of some phosphate pigments (mainly zinc phosphate, Ca phosphate and Ca–Zn phosphates) via chemical oxidation process using ammonium peroxydisulphate. The second step involved the formulation of the various ingredients of the powder coating composites using hybrid epoxy/polyester and polyester as binders with various doses of phosphate pigments and other inorganic pigments and fillers. The prepared powder coating composites were applied on a cold rolled steel panels and were investigated for physicomechanical properties and evaluated for their corrosion protection properties via salt spray chamber for 1000 h. The obtained results showed high performance anti-corrosive powder coatings formulations for steel protection.
Keywords: Powder coatings; Corrosion inhibitors; Conducting polymers; Phosphate pigments; Poly(O-aminophenol).

139. A Study on the Electronic Spectra of Some 2-Azidobenzothiazoles, TD–DFT Treatment

Rafie H. Abu-Eittah, Sabry El-Taher, Walid Hassan and Mahmoud Noamaan

The electronic absorption spectra of some 2-azidobenzothiazoles were measured in different solvents. The effects of solvent and substitution on the spectra were investigated. Substitution by a bromine atom and by a nitro group have significant effects on both band maxima and band intensity. Correlation between the spectra of the studied compounds and the corresponding hydrocarbons proved to be weak, whereas the correlation between the observed spectra and those calculated is adequate. Theoretical treatment of the ultraviolet spectra of the studied compounds was carried out by using the TD–DFT procedures, at the B3LYP level and the 6-311+G// basis sets, the results compared well with the experimental values. The computed molecular orbitals of the ground state indicate that some orbitals are ''localized-π'' or ''localized σ'' molecular orbitals while the others are delocalized orbitals. The calculated functions of the excited states lead to an accurate assignment of the bands observed in the spectra.
Keywords: Azidobenzothiazoles; Electronic absorption spectra; σ and π electronic transitions; TD/DFT-treatment.

140. DNA Binding, Photo-Induced DNA Cleavage and Cytotoxicity Studies of Lomefloxacin and Its Transition Metal Complexes

Mohamed A. Ragheb, Mohamed A. Eldesouki and Mervat S. Mohamed

This work was focused on a study of the DNA binding and cleavage properties of lomefloxacin (LMF) and its ternary transition metal complexes with glycine. The nature of the binding interactions between compounds and calf thymus DNA (CT-DNA) was studied by electronic absorption spectra, fluorescence spectra and thermal denaturation experiments. The obtained results revealed that LMF and its complexes could interact with CT-DNA via partial/moderate intercalative mode. Furthermore, the DNA cleavage activities of the compounds were investigated by gel electrophoresis. Mechanistic studies of DNA

cleavage suggest that singlet oxygen (1O2) is likely to be the cleaving agent via an oxidative pathway, except for Cu(II) complex which proceeds via both oxidative and hydrolytic pathways. Antimicrobial and antitumor activities of the compounds were also studied against some kinds of bacteria, fungi and human cell lines.

Keywords: Lomefloxacin; Transition metal complexes; DNA binding and cleavage; Intercalative mode; Cytotoxic activities.

141. Correlation Between Ionic Radii of Metal Azodye Complexes and Electrical Conductivity

N.A. El-Ghamaz, A.Z. El-Sonbati, M.A. Diab, A.A. El-Bindary, G.G. Mohamed and Sh.M. Morgan

Spectrochimica Acta Part A: Molecular And Biomolecular Spectroscopy, 147: 200-2011 (2015) IF: 2.353

5-(2,3-Dimethyl-1-phenylpyrazol-5-one azo)-2-thioxo-4-thiazolidinone (HL) and its metal complexes with copper(II) (1), cobalt(II) (2) and nickel(II) (3) are synthesized and characterized by physico-chemical techniques. The thermal properties of the ligand (HL) and its metal complexes (1–3) are discussed. The thermal activation energies of decomposition (Ea) of HL and its metal complexes with Cu(II), Co(II) and Ni(II) are found to be 48.76, 36.83, 30.59 and 40.45 kJ/mol, respectively. The frequency and temperature dependence of ac conductivity, dielectric constants for HL and its complexes (1–3) are investigated in the temperature range 300–356 K and frequency range 0.1–100 kHz. Both of the ac conductivity and the values of the thermal activation energy for conduction, as well as the dielectric properties of the complexes of HL are found to depend on the nature of the metallic ions. The values of the thermal activation energies of electrical conductivity decrease with increasing the value of test frequency. The small polarons tunneling (SPT) is the dominant conduction mechanism for the ligand (HL), while for complex (2) the overlapping large tunneling model (OLPT) is the dominant conduction mechanism. The correlated barrier hopping (CBH) is the dominant conduction mechanism for both of the complexes (1) and (3).

Keywords: Azo rhodanine; Supramolecular CU(II)/CO(II) and NI(II); Complexes; Thermal properties AC conductivity; Dielectrical properties.

142. Ternary Metal Complexes of Guaifenesin Drug: Synthesis, Spectroscopic Characterization and in Vitro Anticancer Activity of the Metal Complexes

W.H. Mahmoud, N.F. Mahmoud, G.G. Mohamed, A.Z. El-Sonbati and A.A. El-Bindary

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 150: 451-460 (2015) IF: 2.353

The coordination behavior of a series of transition metal ions named Cr(III), Fe(III), Mn(II), Co(II), Ni(II), Cu(II), Zn(II) and Cd(II) with a mono negative tridentate guaifenesin ligand (GFS) (OOO donation sites) and 1,10-phenanthroline (Phen) is reported. The metal complexes are characterized based on elemental analyses, IR, ^{1}H NMR, solid reflectance, magnetic moment, molar conductance, UV–vis spectral studies, mass spectroscopy, ESR, XRD and thermal analysis (TG and DTG). The ternary metal complexes were found to have the formulae of

[M(GFS)(Phen) Cl]ClnH$_2$O (M = Cr(III) (n = 1) and Fe(III) (n = 0)), [M(GFS)(Phen)Cl] nH$_2$O (M = Mn(II) (n = 0), Zn(II) (n = 0) and Cu(II) (n = 3)) and [M(GFS)(Phen)(H$_2$O)]ClnH$_2$O (M = Co(II) (n = 0), Ni(II) (n = 0) and Cd(II) (n = 4)). All the chelates are found to have octahedral geometrical structures. The ligand and its ternary chelates are subjected to thermal analyses (TG and DTG).

The GFS ligand, in comparison to its ternary metal complexes also was screened for their antibacterial activity on gram positive bacteria (Bacillus subtilis and Staphylococcus aureus), gram negative bacteria (Escherichia coli and Neisseria gonorrhoeae) and for in vitro antifungal activity against (Candida albicans). The activity data show that the metal complexes have antibacterial and antifungal activity more than the parent GFS ligand. The complexes were also screened for its in vitro anticancer activity against the Breast cell line (MFC7) and the results obtained show that they exhibit a considerable anticancer activity.

Keywords: Ternary metal complexes; Guaifenesin; Thermal and spectroscopic analyses; 1,10-Phenanthroline; Biological activity and anticancer activity.

143. Coordination Behavior of New Bis Schiff Base Ligand Derived from 2-Furan Carboxaldehyde and Propane-1,3-Diamine. Spectroscopic, Thermal, Anticancer and Antibacterial Activity Studies

Gehad G. Mohamed , Ehab M. Zayed and Ahmed M.M. Hindy

Spectrochimica Acta Part A: Molecular And Biomolecular Spectroscopy, 145: 76-84 (2015) IF: 2.353

Novel bis Schiff base ligand, [N1,N3-bis(furan-2-ylmethylene)propane-1,3-diamine], was prepared by the condensation of furan-2-carboxaldehyde with propane-1,3-diamine. Its conformational changes on complexation with transition metal ions [Co(II), Ni(II), Cu(II), Mn(II), Cd(II), Zn(II) and Fe(III)] have been studied on the basis of elemental analysis, conductivity measurements, spectral (infrared, 1H NMR, electronic), magnetic and thermogravimetric studies. The conductance data of the complexes revealed their electrolytic nature suggesting them as 1:2 (for bivalent metal ions) and 1:3 (for Fe(III) ion) electrolytes. The complexes were found to have octahedral geometry based on magnetic moment and solid reflectance measurements. Thermal analysis data revealed the decomposition of the complexes in successive steps with the removal of anions, coordinated water and bis Schiff base ligand. The thermodynamic parameters were calculated using Coats–Redfern equation.

The Anticancer screening studies were performed on human colorectal cancer (HCT), hepatic cancer (HepG2) and breast cancer (MCF-7) cell lines. The antimicrobial activity of all the compounds was studied against Gram negative (Escherichia coli and Proteus vulgaris) and Gram positive (Bacillus vulgaris and Staphylococcus pyogones) bacteria. It was observed that the coordination of metal ion has a pronounced effect on the microbial activities of the bis Schiff base ligand. All the metal complexes have shown higher antimicrobial effect than the free bis Schiff base ligand.

Keywords: Schiff base ligand; Transition metal complexes; Spectroscopy; Anticancer activity; Antibacterial activity.

144. Regioselective Synthesis and AB Initio Calculations of Fused Heterocycles Thermally and Under Microwave Irradiation

Mostafa E. Salem, Ashour A. Ahmed, Mohamed R. Shaaban, Mohamed F. Shibl and Ahmad M. Farag

Pyrazolo[1,5-a]pyrimidine, triazolo[1,5-a]pyrimidine, and pyrimido[1,2-a]benzimidazole, pyrido[1,2-a]benzimidazole ring systems incorporating phenylsulfonyl moiety were synthesized via the reaction of 3-(N,N-dimethylamino)-1-(thiophen-2-yl)-2-(phenylsulfonyl)prop-2-en-1-one derivatives with the appropriate aminoazoles as 1,3-binucleophiles and 1H-benzimidazol-2-ylacetonitrile using conventional methods as well as microwave irradiation. The regioselectivity of the cyclo-condensation reactions was confirmed both experimentally by alternative synthesis of reaction products and theoretically using ab initio quantum chemical calculations namely the Density Functional Theory (DFT). The theoretical work was carried out using the Becke, three parameter, Lee–Yang–Parr hybrid functional (B3LYP) combined with the 6-311++G(d,p) basis set. It was found that the final cyclocondensation reaction product depends mainly on the initial addition to the activated double bond by the nitrogen atom of the 1,3-binucleophiles that has the higher electron density.

Keywords: Regioselectivity; DFT calculations; Cyclocondensation; Sulfones; Alterative synthesis.

145. Design, Synthesis, Characterization, Quantum-Chemical Calculations and Anti-Inflammatory Activity of Novel Series of Thiophene Derivatives

M.H. Helal, M.A. Salem, M.A. Gouda, N.S. Ahmed and A.A. El-Sherif

Interaction of 1-(4-morpholinophenyl)ethanone 1 with either malononitrile or ethyl cyanoacetate 2 afforded Knoevenagel–Cope product 3. In subsequent treatment of 3 with sulfur, the 2-aminothiophene derivatives (4a, 4b) are formed under basic conditions. The solvent-free reaction of thiophene derivative 4a with ethyl cyanoacetate afforded thieno[2,3-d][1,3]oxazine derivative 6. The base catalyzed condensation of 2-aminothiophene derivative (4a) with ethyl cyanoacetate afforded N-(thieno-2-yl) cyanoacetamide derivative 7. The latter was used to synthesize different heterocyclic derivatives comprising, pyridine and coumarin rings. Also, several substituted thieno[2,3-d]pyrimidines have been prepared from reaction of 2-aminothiophene-3-carbonitrile 4b with some electrophilic reagents. The structure of the newly compounds were confirmed on the basis of elemental analysis and spectral data. The molecular modeling of the synthesized compounds has been drawn and their molecular parameters were calculated. Also, valuable information is obtained from calculation of the molecular parameters including electronegativity, net dipole moment of the compounds, total energy, electronic energy, binding energy, HOMO and LUMO energy. Evaluation of anti-inflammatory activity of the tested compounds was performed in albino rats by producing carrageenan induced paw oedema and measuring the zone of inflammation at different time intervals i.e.

1, 2, 3 and 4 h after carrageenan injection. Results indicated that most of the tested compounds showed moderate to good activity comparable to indomethacin. Also, compound 16 with additional morpholine ring beside the thiophene ring inhibits carrageenan induced paw oedema more than the standard indomethacin drug at all the time scales studied. Thus, compound 16 is considered as a promising compound for further modification to obtain clinically useful anti-inflammatory agent.

Keywords: Thiophene; Morpholine; Synthesis; Spectra; Modeling; Anti-inflammatory.

146. Synthesis, Biological Evaluation and Molecular Modeling of Novel Series of Pyridine Derivatives as Anticancer, Anti-Inflammatory and Analgesic Agents

M.H. Helal, S.A. El-Awdan, M.A. Salem, T.A. Abd-elaziz, Y.A. Moahamed and A.A. El-Sherif G.A.M. Mohamed

This paper presents a combined synthesis; characterization, computational and biological activity studies of novel series of pyridines heterocyclic compounds. The compounds have been characterized by elemental analyses and spectral like IR, 1H NMR, 13C NMR and MS studies. Michael addition of substituted-2-methoxycarbonylacetanilide 2a,b on the a-substituted cinnamonitriles 3a–d gave the corresponding 2-pyridone derivatives 5–10. Structures of the titled compounds cited in this article were elucidated by spectrometric data (IR, 1H NMR, 13C NMR and MS). The molecular modeling of the synthesized compounds has been drawn and their molecular parameters were calculated. Also, valuable information is obtained from the calculation of molecular parameters including electronegativity, net dipole moment of the compounds, total energy, electronic energy, binding energy, HOMO and LUMO energy. Various in vitro antitumor as well as in vivo anti-inflammatory and analgesic activities of the synthesized compounds were investigated. Evaluation of anti-inflammatory activity of test compounds was performed using carrageenan induced paw edema in rats. All the tested compounds showed moderate to good activity. The SAR results indicate that all compounds showed moderate to good activity, among these 7 and 10 compounds having –N(CH3)2 group are most effective.

Keywords: Anti-inflammatory; Pyridines; Infrared; NMR.

147. Structure Investigation of Three Hydrazones Schiff'S Bases by Spectroscopic, Thermal and Molecular Orbital Calculations and Their Biological Activities

Arafa A.M. Belal, M.A. Zayed, M. El-Desawy and Sh.M.A.H. Rakha

Three Schiff`s bases AI (2(1-hydrazonoethyl) phenol), AII (2, 4-dibromo 6-(hydrazonomethyl)phenol) and AIII (2(hydrazonomethyl) phenol) were prepared as new hydrazone compounds via condensation reactions with molar ratio (1:1) of reactants. Firstly by reaction of 2-hydroxy acetophenone solution and hydrazine hydrate; it gives AI. Secondly condensation between 3,5-dibromo-salicylaldehyde and hydrazine hydrate gives AII. Thirdly condensation between salicylaldehyde and

hydrazine hydrate gives AIII. The structures of AI–AIII were characterized by elemental analysis (EA), mass (MS), FT-IR and ^{1}H NMR spectra, and thermal analyses (TG, DTG, and DTA). The activation thermodynamic parameters, such as, ΔE^*, ΔH^*, ΔS^* and ΔG^* were calculated from the TG curves using Coats–Redfern method. It is important to investigate their molecular structures to know the active groups and weak bond responsible for their biological activities. Consequently in the present work, the obtained thermal (TA) and mass (MS) practical results are confirmed by semi-empirical MO-calculations (MOCS) using PM3 procedure. Their biological activities have been tested in vitro against Escherichia coli, Proteus vulgaris, Bacillissubtilies and Staphylococcus aurous bacteria in order to assess their anti-microbial potential.

Keywords: Novel schiff'S bases; Spectroscopic investigation; Thermal analyses; Molecular orbital calculation; Biological activity.

148. Synthesis of Novel Schiff'S Bases of Highly Potential Biological Activities and their Structure Investigation

Ehab M. Zayed and M.A. Zayed

Novel bisaldehyde-hydrazide Schiff's bases AS1 (2,20- (ethane-1,2-diylbis (oxy)) dibenzaldehyde terephthalohydrazide) and AS2 (N0,N0 00-(((ethane-1,2-diylbis (oxy)) bis(2,1 phenylene))bis(methanylylidene)) di(benzohydrazide)) were prepared as new macrocyclic compounds via condensationreactions. AS1had been prepared by condensation between (2,20-(ethane-1,2-diylbis(oxy)) dibenzaldehyde) bisaldehyde and terephthalohydrazide in a ratio1:1. AS2 had been obtained by condensation between (2,20-(ethane-1, 2-diylbis(oxy))dibenzaldehyde) bisaldehyde and benzohydrazide in ratio 1:2. The structures of AS1 and AS2 were characterized by elemental analysis (EA), mass (MS), FT-IR and ^{1}H-NMR spectra, and thermal analyses (TG, DTG). The activation thermodynamic parameters such as ΔE^*, ΔH^*, ΔS^* and ΔG^* were calculated from the TG curves using Coats–Redfern method. It is important to investigate their molecular structures to know the active groups and weak bonds responsible for their biological activities. Consequently in the present work, the obtained thermal (TA) and mass (MS) practical results are confirmed by semi-empirical MO-calculations (MOCS) using PM3 procedure. Their biological activities had been tested in vitro against Escherichia coli, Proteus vulgaris, Bacillus subtilis and Staphylococcus aurous bacteria in order to assess their anti-microbial potential.

Keywords: Novel bisaldehyde-hydrazide schiff'S bases; Spectroscopic investigation; Thermal analyses; Molecular orbital calculation; Biological activity.

149. Preparation and Structure Investigation of Novel Schiff Bases Using Spectroscopic, Thermal Analyses and Molecular Orbital Calculations and Studying their Biological Activities

Ehab M. Zayed, M.A. Zayed and M. El-Desawy

Two novel Schiff's bases (EB1 and L1) as new macrocyclic compounds were prepared via condensation reactions between bisaldehyde (2,20-(ethane-1,2-diylbis(oxy))dibenzaldehyde): firstly with hydrazine carbothioamide to give (EB1), secondly with 4,6-diaminopyrimidine-2-thiol to give (L1). EB1 has a general formula $C_{18}H_{20}N_6O_2S_2$ of mole mass = 416.520, and IUPAC name ((N,N0Z,N,N0E)-N,N0-(((ethane1,2diylbis(oxy))bis(2,1phenylene))bis(methanylylidene))bis(1hydrazinylmet hanethioamide). L1 has a general formula C20H16N4O2S of mole mass = 376.10; and IUPAC name 1,2-bis(2-vinylphenoxy)ethane4,6- diaminopyrimidine-2-thiol).

The structures of the compounds obtained were characterized based on elemental analysis, FT-IR and ^{1}H NMR spectra, mass, and thermogravimetric analysis (TG, DTG). The activation thermodynamic parameters, such as, ΔE, ΔH, ΔS and ΔG were calculated from the TG curves using Coats–Redfern method.

It is important to investigate their structures to know the active groups and weak bond responsible for their biological activities. The obtained thermal (TA) and mass (MS) practical results are confirmed by semi-empirical MO-calculation using PM3 procedure, on the neutral and positively charged forms of these novel Schiff bases. Therefore, comparison between MS and TA

Keywords: Novel schiff'S bases; Spectroscopic investigation; Thermal analyses; Molecular orbital calculation; Biological activity.

150. Ozone Electrogeneration on Pt-TaO$_y$ sol-gel Film Modified Titanium Electrode: Effect of Electrode Composition on the Electrocatalytic Activity

Mohamed I. Awad, Shunsuke Sata, Kazuhiro Kaneda, Mineo Ikematsu and Takeo Ohsaka

This work examines the ozone electrogeneration (OE) at a binary coating of different nominal compositions (Pt)x-(TaO$_y$)(100-x), where x (percentage in the precursor solution) varied between 1% and 100%, coated on titanium substrate prepared by a sol-gel technique.

The OE is performed in an artificial tap water at room temperature (25 ˚C). The percentages of Pt and TaO$_y$ in the coating significantly affect the electrocatalytic activity towards oxygen evolution. The oxygen evolution was retarded to a different extent based on the electrode composition. The largest retardation was obtained at the (Pt)10-(TaO$_y$)90 electrode (ca. 480 mV positive shift) as compared with the (Pt)100-(TaO$_y$)0 electrode. This was reflected in a high current efficiency (CE) of OE (ca. 19.3%) at the former electrode.

This value is considered to be among the highest values reported for OE at 25 ˚C in neutral media. The composite electrodes were characterized by voltammetric and surface techniques. A plausible explanation for the change of the efficiency of OE with the electrode composition is given based on the electrochemical results.

Keywords: Ozone; Electrocatalysis; Oxygen evolution; Dimensionally stable anode; Sol-Gel.

151. Novel Synthesis of Magnesium Hydroxide Nanoparticles Modified With Organic Phosphate and Their Effect on the Flammability of Acrylonitrile-Butadiene Stryrene Nanocomposites

Nour F. Attia, Emad S. Goda, M.A. Nour, M.W. Sabaa and M.A. Hassan

New and facile method for the synthesis and modification of magnesium hydroxide nanoparticles has been developed. The organic phosphate was used to facilitate the synthesis and wrapping of magnesium hydroxide nanoparticles with organic phosphate shell. The size of the nanoparticles wrapped with phosphate has an average diameter range from 46 to 125 nm. The preparation method has governed the nanoparticles diameter based on reaction time. Thermal stability and morphological properties of the new nanoparticles coated phosphates were investigated. The developed magnesium hydroxide nanoparticles-organic phosphate achieved a very good compatibility when dispersed in acrylonitrile-butadiene styrene polymer (ABS) produced dispersed nanocomposites. The flammability and thermal properties of the new polymer nanocomposites were studied. The rate of burning of the nanocomposites was reduced to 9.8 mm/min compared to 15, 21.9 and 42.5 mm/min for polymer-conventional magnesium hydroxide composite, polymer-conventional magnesium hydroxide-organic phosphate composite and virgin polymer, respectively. The peak heat release rate (PHRR) and total heat release (THR) of the new nanocomposites were recorded as 243.4 kW/m2 and 19.2 MJ/m2, respectively, achieved 71% reduction for PHRR and 55% for THR. The synergism between magnesium hydroxide nanoparticles and organic phosphates shell was also studied. The developed nanoparticles suppressed the emission of toxic gases. The different materials were characterized using thermal gravimetric analysis, fourier transform infrared spectroscopy, transmission electron microscopy. The flammability properties were evaluated using UL94 horizontal method and cone calorimeter. The dispersion of magnesium hydroxide nanoparticles-organic phosphate in ABS was studied using scanning electron microscope.
Keywords: Composite materials; Nanostructures; Polymers; Thermal properties.

152. Pentachlorophenol (PCP) Adsorption from Aqueous Solution by Activated Carbons Prepared from Corn Wastes

N. T. Abdel-Ghani, G. A. El-Chaghaby and E. M. Zahran

Corn wastes generated from starch and glucose production industry were used for the preparation of activated carbons. The prepared activated carbons and a commercial activated carbon were evaluated for their capability of adsorbing pentachlorophenol (PCP) from aqueous solution. Batch adsorption experiments were performed under different operating conditions including pH (2–8), adsorbent dosage (0.5–4.0 g/l), initial PCP concentration (10–100 mg/l), contact time (30–300 min), and temperature (25–45 °C). The kinetics and equilibrium models describing the adsorption of PCP by the prepared adsorbents were obtained. The adsorption of PCP by corn waste-based adsorbents was found to follow the second-order kinetics and the Freundlich equilibrium models. The intraparticle diffusion mechanism was successfully fitted to the obtained experimental data. Thermodynamic studies indicated that the adsorption process was exothermic. The adsorbents surface characterization revealed the presence of many functional groups capable of binding the adsorbate molecules. The study results suggest the possible use of corn wastes as a starting material for the production of activated carbon, thus lowering the costs of wastewater treatment processes.
Keywords: Activated carbon; Adsorption; Corn waste; Isotherms; Kinetics; Pentachlorophenol; Thermodynamics.

153. Cure Kinetics, Thermal Stability, and Dielectric Properties of Epoxy/Barium Ferrite/Polyaniline Composites

Gamal R. Saad Adel A. Ezz and Hoda A. Ahmed

Barium ferrite/polyaniline composites (Ba ferrite/PANI) were synthesized using in situ polymerization of different BaFe12O19/aniline weight ratios and dispersed in diglycidyl ether bisphenol-A/carboxylated polyester (DGEBA/CPE) hybrid powder coating system. The effects of heating rate, Ba ferrite/PANI compositions and their loading level on the curing process was investigated by differential scanning calorimetry (DSC) in the dynamic mode. The activation energy of the cure reaction was examined utilizing Kissinger–Akahira–Sunose (KAS) method. It was found that the activation energy of the cure reaction of the epoxy increases with increasing the content of the filler. The dielectric properties were studied using dielectric relaxation analysis over a range of frequency (0.2–100 kHz) at 30 C. The obtained dielectric data were analyzed using complex permittivity and modulus formalisms, depending on the concentration of filler in the epoxy matrix.
Keywords: Epoxy; ba ferrite/polyaniline; composites; Cure kinetics; Dielectric properties; Electric modulus.

154. Cure Kinetics and Thermal Stability of Maleimide Modified Epoxy TGIC/CPE Powder Coating System

Gamal R. Saad Heba M. Abdallah, Mohamed S. Abdel Aziz, Nadia A. Mohamed and Magdy W. Sabaa

The curing kinetics of the modified triglycidyl isocyanurate (TGIC) with various content of N-phenylmaleimido group and carboxylated polyester (CPE) was investigated using dynamic differential scanning calorimetry (DSC). The curing kinetic behavior was well described by Šesták–Berggren (SB (m, n)) model. The m order of the curing reaction was varied from 0.229 to 0.356 and n order varied from 1.278 to 2.035, depending on the PMI content. In addition, the isoconversional method of Kissinger–Akahira–Sunose (KAS) was applied to correlate the activation energy (E_a) with the extent of cure. The obtained E_a increased with increasing phenyl maleimide content. As α increases, E_a declined up to $\alpha \approx 0.3$, then remained almost constant for $\alpha \approx 0.3$–0.8, and finally increased until completion of

reaction, indicating complex reaction mechanism. The thermal stability of the cured modified TGIC/CPE was enhanced with incorporation of phenyl maleimide.
Keywords: TGIC; Maleimide; Dynamic reaction kinetics; Šesták–berggren model; KAS method.

155. Non-Isothermal Crystallization Kinetics of Poly(3-Hydroxybutyrate) in Copoly(Ester-Urethane) Nanocomposites Based on Poly(3- Hydroxybutyrate) and Cloisite 30B

Mohamed S. Abdel Aziz, Gamal R. Saad and Hala F. Naguib

Thermochimica Acta, 605: 52-62 (2015) IF: 2.184

The non-isothermal melt crystallization kinetics of PHB segment in copoly(ester-urethane)s based on poly(3-hydroxybutyrate) and poly(butylene adipate) and their nanocomposites with cloisite 30B (C30B) were investigated at different cooling rates (5, 10, 15, and 20 C min1) using DSC. Ozawa, Avrami, and the combined Avrami–Ozawa (Mo) methods were used for analyzing the non-isothermal crystallization behavior. The results showed that Avrami and Ozawa models provide a fair description of the non-isothermal crystallization process while Mo model was successful in describing it. The results indicated that C30B not only served as heterogeneous nucleating agents for PHB crystallization, at lower content (5 wt%), but also restricted the mobility and diffusion of PHB chains at higher content (10 wt%). Polarized optical microscope (POM) showed that the nucleation density of PHB segment was increased significantly in the case of nanocomposites. The isoconversional method of Friedman was used to determine the effective activation energy of crystallization of the PUs and the Lauritzen–Hoffman parameters (Kg and U*) were calculated by applying the Vyazovkin method.
Keywords: Poly(3-Hydroxybutyrate); Poly (ester-urethane)S; Nanocomposites; Non-isothermal crystallization kinetics; Effective activation energy; Nucleation.

156. Electroanalysis of Benazepril Hydrochloride Antihypertensive Drug Using An Ionic Liquid Crystal Modified Carbon Paste Electrode

Ahmed Galal, Nada F. Atta, Shereen M. Azab and Asmaa H. Ibrahim

Electroanalysis, 27: 1282-1292 (2015) IF: 2.138

Electroanalysis of benazepril HCl was successful using a carbon paste electrode modified with an ionic liquid crystal (1-butyl-1-methylpiperidinium hexafluorophosphate) in presence of sodium dodecyl sulfate. The electrode performance was compared to ionic liquids (1-n-hexyl-3-methyl imidazolium tetrafluoroborate and 1-butyl-4-methyl pyridinium tetrafluoroborate). Electrochemical determination of benazepril HCl was in the linear dynamic range of 8.89×10^{-7} to 1.77×10^{-5} $molL^{-1}$ (correlation coefficient 0.999) and LOD 7.17×10^{-9} $molL^{-1}$. benazepril HCl was determined using this sensor in presence of urine metabolites such as uric acid, ascorbic acid. Binary mixtures of dopamine/benazepril and amlodipine/benazepril were also determined successfully.
Keywords: Ionic liquid crystal; Electroanalysis; Benazepril HCL; Surfactants; Carbon paste electrode.

157. Electrochemical Morphine Sensor Based on Gold Nanoparticles Metalphthalocyanine Modified Carbon Paste Electrode

Nada F. Atta, Ahmed Galal, Fatma M. Abdel-Gawad and Eman F. Mohamed

Electroanalysis, 27(2): 415-428 (2015) IF: 2.138

Composites of gold nanoparticles (Au) electrochemically deposited and different metal phthalocyanines (Co, Ni, Cu, and Fe) were chemically prepared. The composites were used as modifiers for carbon paste electrodes and were used for the determination of morphine in presence of ascorbic acid and uric acid. Central metal atoms of phthalocyanine moiety affected the rate of electron transfer. Thus, the electroactivity of different modifiers were evaluated towards morphine oxidation. Au-CoPcMCPE possessed the highest rate for charge transfer rate in all studied pH electrolytes. Limit of detection was 5.48109 molL1 in the range of 4.0107 to 9.0104 molL1.
Keywords: Carbon paste electrode; Phthalocyanine; Gold nanoparticles; Sensor; Morphine; Human urine.

158. Comparative Study of Carbon Paste, Screen Printed, and PVC Potentiometric Sensors Based on Copper-Sulphamethazine Schiff Base Complex For Determination of Iodide–Experimental and Theoretical Approaches

F. M. Abdel-Haleem and Ola R. Shehab

Electroanalysis, 27: 1-9 (2015) IF: 2.138

New poly vinyl chloride (PVC) membrane, carbon paste (CP), and screen printed (SP) electrodes are constructed for iodide sensing. They are based on copper (II)-sulphamethazine Schiff base complex as suitable carrier. Mechanism was proved by FT-IR and UV-Vis spectroscopy. Computational study involving binding energies calculations at DFT/B3LYP level of theory confirmed the proposed mechanism and agreed the observed selectivity pattern. Responses are near-Nernstian (-55.0, -51.0 mV/concentration decade) for PVC, and SP electrodes, and super-Nernstian (-61.2 mV/concentration decade) for the CP electrode. Lower limit of detection (3.2×10-6 $molL^{-1}$) and improved selectivity over the highly interfering thiocyanate were obtained in comparison with the previously reported Schiff base complexes-based iodide sensors.
Keywords: Carbon paste; DFT; Iodide sensor; PVC; Screen printed electrode.

159. Electrocatalytic Nitrite Determination Using Iron Phthalocyanine Modified Gold Nanoparticles

Ayman Ali Saeed, Baljit Singh, Mohammed Nooredeen Abbas, Yousry Moustafa Issa and Eithne Dempsey

Electroanalysis, 27(5): 1086-1096 (2015) IF: 2.138

Electrochemical detection of nitrite was achieved via electrodeposition of gold nanoparticles (AuNPs) onto glassy carbon electrodes, followed by 3-mercaptopropionic acid (MPA) self-assembly, enabling attachment of an iron(III) monoamino-phthalocyanine (FeMAPc) catalyst via amide bond formation.

The use of scanning electron microscopy, energy dispersive X-ray spectroscopy and ultraviolet-visible spectroscopy realised surface characterisation while cyclic voltammetry and electrochemical impedance spectroscopy techniques were applied for electrochemical interrogation. The electrochemical behaviour of nitrite at the bare (GCE), AuNPs/GCE, FeMAPc/GCE and FeMAPc-MPA/AuNPs/GCE was further scrutinised using differential pulse voltammetry in phosphate buffer solution (0.1 M PBS, pH 5.8). Overall the FeMAPc-MPA/AuNPs/GCE resulted in sensitivity 14.5 nA/µM, which was double that of AuNPs/GCE, 2.4 times FeMAPc/GCE and 3.5 times the response at a bare GCE, with linear range 1.9 µM–2.04 mM (PBS, pH 5.8) and LOD 0.21 µM. An interference study revealed that the proposed sensor (FeMAPc-MPA/AuNPs/GCE) exhibited a selective response in the presence of interfering anions and the analytical capability of the sensor was demonstrated via nitrite ion determination in real water samples.

Keywords: Nanoparticles; Nitrite detection; Iron phthalocyanine; Self-assembled monolayer.

160. Solvent-Drop Grinding Method: Efficient Synthesis, Dpph Radical Scavenging and Anti-Diabetic Activities of Chalcones, Bis-Chalcones, Azolines, and Bis-Azolines

Sobhi M. Gomha, Sayed M. Riyadha and Mohamed M. Abdalla

Current Organic Synthesis, 12: 220-228 (2015) IF: 2.117

Highly efficient one-pot solvent-free grinding method was reported for synthesis of chalcones 3a-j, 5a,b, 7 and bis-chalcones 9, 11. Cyclodehydration of bis-chalcones 9, 11 and chalcones 3 with hydrazine derivatives under solvent-free grinding method afforded bis-pyrazolines 12a,b, 13a,b and pyrazoline derivatives 14a-g, respectively. In a similar manner, grinding of bis-chalcones 9, 11 and chalcones 3 with hydroxylamine hydrochloride under the employed reaction conditions gave bis-isoxazolines 15, 16 and isoxazoline derivatives 17a-e, respectively. The antioxidant activity of the selected products was studied using 1,1-diphenyl-2-picrylhydrazyl radical (DPPH) assay. Also, the antidiabetic activity of the selected products against normal and alloxan induced diabetic mice was evaluated.

Keywords: Anti-diabetic activity; Antioxidant activity; Bis-isoxazolines; Bis-pyrazolines; Enones; Isoxazolines; Pyrazolines; Solvent-free grinding.

161. Chemistry and Biological Activity of Pyridotriazolopyrimidines

Thoraya A. Farghaly, Kamal M. Dawood and Mohamed R. Shaabana

Current Organic Synthesis, 12: 230-260 (2015) IF: 2.117

Fused heterocycles constitute the largest diversity of heterocyclic compounds of chemical and biomedical significance. They widely exist in numerous natural products. They are also among the most frequently encountered scaffolds in numerous drugs and pharmaceutically relevant substances. This review highlights some remarkable achievements made in the synthesis and chemistry of pyridotriazolopyrimidines that have appeared in more than the last three decades. The latter heterocyclic ring systems have more than twenty five structures. Moreover, the biological importance of such ring systems is discussed.

Keywords: Biological activity; Pyridotriazolopyrimidines; Reactions; Synthesis.

162. A Facile Synthesis of New Polyazaheterocycles Via One-Pot Three-Components Condensation Reaction and Study of their Reactions with Nitrilimines

Thoraya A. Farghaly, Ahmad S. Shawali, Eman M. H. Abbas and Naglaa A. Abdel-hafez

Current Organic Synthesis, 12: 95-101 (2015) IF: 2.117

A direct and efficient approach for the synthesis of new series of pyrido[3,4-c][1,5]benzothiazepine, pyrido[4,3-d]triazolo[1',5'-a]pyrimidines, pyrido[4,3-d]tetrazolo [1',5'-a]pyrimidine and pyrido[4,3-4',5']pyrimido[1',2'- a]benzimidazoles has been developed via condensation of o-aminothiophenol and heterocyclic amines each with 1-ethyl- 4-piperidinone and the appropriate aldehyde. The reactions were performed in refluxing acetonitrile in the presence of molecular iodine as a catalyst. Also, the 1,3-dipolar cycloadditions of nitrilimines to the latter products were examined and were found to be site- and regioselective. The structures of the new synthesized compounds were established on the basis of spectral data (Mass, IR, 1H and 13C NMR) and elemental analyses.

Keywords: 1,3-Dipolar cycloaddition; 1-Ethylpiperidinone; Heterocyclicamines; Pyrido[3,4-C][1,5]benzothiazepine.

163. Annulated 3-Amino-4-Imino-Pyrimidines: their Utility as Useful Precursors for Synthesis of Fused Heterocycles

Ahmad Sami A. S. Shawali

Current Organic Synthesis, 12: 391-430 (2015) IF: 2.117

This review primarily focuses on the publications within the last 25 years (i.e. from 1990 to 2014) related to the advances in the synthesis and reactions of annulated 3-amino-4-iminopyrimidines. The literature results covered in this review demonstrate that the studied reactions are chemo-selective.

Keywords: Dimroth rearrangement; Fused triazoles; Tetrazoles; Triazines and triazepines; Heterocycles.

164. Thermal, Spectroscopic Studies and Hydrogen Bonding in Supramolecular Assembly of Azo Rhodanine Complexes

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Inorganica Chimica Acta, 430: 96-107 (2015) IF: 2.046

A novel series of Cu(II) complexes of azo rhodanine derivatives (HL$_n$) have been prepared and characterized by thermal analysis, spectral studies (IR, mass, UV–Vis, ESR) and magnetic measurements. IR spectra suggest that the HLn acts as a bidentate ligands coordinating via (N@N) and deprotonated enolized carbonyl oxygen (–C–O–). ESR spectra of the Cu(II) complexes show d$_{x2-y2}$ as a ground state, suggesting tetrahedral distorted or

square planar geometries around Cu(II) center. The X-ray diffraction (XRD) patterns powder forms of Cu(II) complexes shows many diffraction peaks which indicates the polycrystalline phase. Thermal properties and decomposition kinetics of compounds are investigated. The thermodynamic parameters and evaluation of kinetic parameters (E_a, ΔS^*, ΔH^* and ΔG^*) of thermal decomposition stages have been evaluated using Coats–Redfern and Horowitz–Metzger methods. Cu(II) complexes are screened for their biological activity against bacterial and fungal species. The Cu(II) complexes showed antimicrobial activities against Staphylococcus aureus and Penicillium italicum.
Keywords: Azodye complexes; ESR; Thermal properties; Thermodynamic parameters; Antimicrobial activity.

165. Co(II), Ni(II) and Cu(II) Complexes of Azo-Aminopyrazole Ligand: Spectroscopic, Crystal Structure and Quantum Chemical Calculations

Nour T. Abdel-Ghani, Ahmed M. Mansour, Maha F. Abo El-Ghar, Ola M. El-Borady and Hashem Shorafa

Reaction of 5-Methyl-4-(2-nitro-phenylazo)-2-phenyl-2H-pyrazol-3-ylamine (H2L) with Co(II), Ni(II) and Cu(II) salts affords complexes of the type [M(HL)2], which were characterized by elemental analysis, FT IR, UV–Vis, magnetic susceptibility, conductance measurements and single crystal X-ray diffraction. H2L crystallizes in a monoclinic space group C2/c, while the Cu(II) complex crystallizes in the triclinic View the MathML source(2) space group. H2L behaves as a mono-negatively bidentate ligand via Ndouble bond; length as m-dashN and NH-. Comparison between the crystal and the optimized data at DFT/B3LYP/6-31G(d) level of theory was discussed. Time-dependent DFT calculations were performed to assign the electronic spectra. The natural charge of NiII is more reduced than CoII and CuII, which suggests the higher complexation ability of H2L toward the former ion.
Keywords: 5-Aminopyrazole; Dyes; NBO; Td-DFT; Metal complexes.

166. Synthesis, Spectroscopic, Dft, Cytotoxicity and Antimicrobial Activity of Pd(II) and Pt(II) Complexes of N,N-Chelated Benzimidazole Derivatives

Ahmed M. Mansour and Nour T. Abdel-Ghani

New cis-platin analogs PdII and PtII complexes of (1H-benzimidazol-2-ylmethyl)-N-(4-chloro-phenyl)-amine (LCl) and (1H-benzimidazol-2-ylmethyl)-N-(4-iodo-phenyl)-amine (LI) were prepared as potential antitumor compounds, characterized (elemental analysis, TG/DTA, FT IR, 1H NMR, MS, UV–Vis. and conductance measurements) and tested for their cytotoxic activities against MCF7, HCT and HEPG2. The antibacterial activity was tested on against Staphylococcus aureus, Bacillus subtilis, Streptococcus faecalis, Escherichia coli, Pseudomonas aeruginosa and Neisseria gonorrhea. The effect of the aniline substituent on the toxicity was discussed. The experimental studies were complemented by quantum chemical calculations.

TD-DFT calculations were carried out to understand the electronic structure and to explain the related experimental findings. Natural bond orbital analysis was performed to provide details about the electronic arrangement, type of hybridization and the nature of bonding.
Keywords: MCF7; Benzimidazole; Spectroscopic; DFT; MEP; NBO.

167. Transition Metal Complexes of Novel Schiff Base
Synthesis, Spectroscopic Characterization, and in Vitro Antimicrobial Activity of Complexes

Ehab M. Zayed, Gehad G. Mohamed and Ahmed M. M. Hindy

New metal(II)/(III) complexes with novel Schiff base, resulted from the condensation of propane-1,3- diamine with bisaldehyde, as tetradentate ligand have been synthesized and characterized using elemental analyses, spectra (IR, ^{1}H NMR and ESR), molar conductance, magnetic moment, and thermal studies. The IR data suggest the coordination mode for the Schiff base ligand which behaves as a tetradentate with the metal ions. Based on the elemental analysis, magnetic studies, electronic, and ESR data, octahedral geometry was proposed for the complexes. The ESR spectra of the Cu(II) complex in powdered form showed an axial symmetry with $^2B_{1g}$ as ground state and hyperfine structure. The thermal stability and degradation of the Schiff base ligand and its metal complexes were studied by TG. The molar conductance in DMF solution indicates that all complexes are electrolytes. The free Schiff base ligand and its metal complexes were tested for their in vitro antimicrobial activity against gram-positive and gram-negative organisms. The results showed that the synthesized complexes exhibited higher antimicrobial activity than their free Schiff base ligand. Of all the studied complexes, the Cu(II) and Co(II) complexes exhibited high antimicrobial activity at low micromolar inhibitory concentrations compared to the other complexes, amikacin standard, and the free Schiff base ligand.
Keywords: Tetradentate schiff base; Synthesis; Metal complexes; Spectroscopic characterization; Antimicrobial activity.

168. Structure Characterization of Terazosin Drug Using Mass Spectrometry and Thermal Analyses Techniques in Comparison With Semi-Empirical Molecular Orbital (MO) Calculations

M. A. Zayed, M. A. Fahmey, M. El-Desawy and Y. S. Farrag

Abstract Terazosin ($C_{19}H_{25}N_5O_4$, MW = 387) drug is a selective alpha 1 antagonist. It is used for lowering the blood pressure. Also, it used for treatment of symptoms of an enlarged prostate and is therefore a drug of choice for men with hypertension and prostate enlargement. In the present study, mass spectrometry (MS) and thermal analyses (TA) were used to investigate the fragmentation decomposition pathways of terazosin and confirmed by semi-empirical molecular orbital (MO) calculation, using PM3 procedure on the neutral and the positively charged

species of the drug. These calculations included, bond length, bond order, partial charge distribution, ionization energy and heats of formation (ΔH_f). The mass spectra and TA fragmentation pathways were proposed and compared to each other to select the most suitable scheme representing the correct fragmentation pathway of the drug in both techniques. This selection helps understanding of metabolism of the drug in vivo system. Therefore, comparison between MS and TA helps in selection, the proper pathway representing the fragmentation of this drug. This comparison successfully confirmed by MO calculation. Graphical Abstract In the present study, mass spectrometry (MS) and thermal analyses (TA) were used to investigate the fragmentation decomposition pathways of terazosin and confirmed by semi-empirical molecular orbital (MO) calculations. The mass spectra and thermal analyses fragmentation pathways were proposed andcompared to each other to select the most suitable scheme representing the correct fragmentation pathway of the drug in both techniques. This selection helps understanding of metabolism of the drug in vivo system. Terazosin hydrochloride ($C_{19}H_{25}N_5O_4$) drug (marketed ITRIN), has an IUPAC name; 2-[4-(2-tetrahydrofuranyl) carbonyl]-1 piperazinyl-6,7-dimethoxy-4-quinazolinamine monohydrochloride dihydrate, and its stereo structure is given below

Keywords: Terazosin; Mass spectrometry; Thermal analysis Molecular orbital calculation; PM3.

169. Complex Formation of Cetirizine Drug With Bivalent Transition Metal(II) Ions in the Presence of Alanine: Synthesis, Characterization, Equilibrium Studies, and Biological Activity Studies

Ahmed M. Rayan, Mahmoud M. Ahmed and Mohamed H. Barakat

Journal Coordination Chemistry, 68: 678-703 (2015) IF: 2.012

The present article reports on the synthesis, characterization, and their electronic absorption spectra of M(II)–ternary complexes involving CTZ as antihistamine drug and alanine as a representative example of amino acids. The geometry of the studied M(II) complexes has been fully optimized using parameterized PM3 semi-empirical method. Protonation and complex formation equilibria were investigated. The antimicrobial activities were investigated. Mononuclear cobalt(II), nickel(II), and copper(II) complexes of cetirizine·2HCl (CTZ = 2-[2-[4-[(4- chlorophenyl)phenyl methyl]piperazine-1-yl]-ethoxy]acetic acid) in the presence of alanine (Ala) as a representative example of amino acids were synthesized and elucidated by different physical techniques. All complexes have been characterized with the help of elemental analyses, molecular weights, molar conductance values, magnetic moments, and spectroscopic data. The measured molar conductance values in DMSO indicate that the complexes are nonelectrolytes. Quantum chemical calculations were performed with semi-empirical method to find the optimum geometry of complexes. The metal–oxygen bond length in the synthesized complexes obeys the order M–OH$_2$ > M– O$_{CTZ}$ > M–O$_{Ala}$. Formation equilibria of the ternary complexes have been investigated. Ternary complexes are formed by a simultaneous mechanism. Stoichiometry and stability constants for the complexes formed are reported. The concentration distributions of various species formed in solution were also evaluated as a function of pH. CTZ and its metal chelates have been screened for their antimicrobial activities

against some selected types of gram-positive (G$^+$) and gram-negative (G$^-$) bacteria. They were more active against (G$^+$) than (G$^-$) bacteria.

Keywords: Cetirizine; Potentiometry; Alanine; Molecular modeling; Spectra; Biological activity.

170. Speciation Studies of Mono- and Binuclear Pd(II) Complexes Involving Mixed Nitrogen–Sulfur Donor Ligand and 4,4''-Bipiperidine as A Linker

Mohamed M. Shoukry and Sameya M.T. Ezzat

Journal of Coordination Chemistry, 68: 3135-3147 (2015) IF: 2.012

Pd(MME)Cl$_2$ complex, where MME = methionine methyl ester, was synthesized and characterized by elemental analysis and spectroscopic techniques. [Pd(MME)(H$_2$O)$_2$]$^{2+}$ interacts with some DNA constituents giving 1 : 1 and 1 : 2 complexes. The binuclear complexes having 4,4'-bipiperidine as a linker and involving [Pd(MME)(H$_2$O)$_2$]$^{2+}$ and DNA constituents were investigated. The results show formation of [(H$_2$O)(MME)Pd(Bip)Pd(MME)(H$_2$O)]$^{4+}$. Inosine, uracil, and thymine interact with the previously mentioned complex by substitution of the two coordinated water molecules. Formation constants of all possible mono- and binuclear complexes were determined and their speciation diagrams were evaluated.

Keywords: Palladium(II) Complexes; Methionine methyl ester; 4,4'-Bipiperidine; DNA constituents; Binuclear complexes; Equilibrium constants.

171. Amine-Bridged Binuclear Complexes Involving [Pd(Ethylenediamine)(H$_2$O)$_2$]$^{2+}$, 4,4''-Bipiperidine and DNA Constituents

Perihan A. Khalaf Alla, Mohamed M. Shoukry and Rudi van Eldikcd

Journal of Coordination Chemistry, 68: 2041-2053 (2015) IF: 2.012

The complex formation equilibria in the reaction of [Pd(en)(H$_2$O)$_2$]$^{2+}$ with 4,4'-bipiperidine (Bip) and DNA constituents such as inosine, inosine-5'-monophosphate, uracil, uridine, thymine, and thymidine were investigated at 25 °C and 0.1 M ionic strength. The [(H$_2$O)(en)Pd(Bip)Pd(en)(H$_2$O)]$^{4+}$ complex and its hydrolyzed species were formed. Substitution of coordinated water by inosine (Ino) as DNA constituent formed the complexes [(Ino)(en)Pd(Bip)Pd(en)(H$_2$O)]$^{3+}$ and [(Ino)(en)Pd(Bip)Pd(en)(Ino)]$^{2+}$. The formation of the binuclear complexes was further supported by spectral measurements. The formation constants of all possible mono- and binuclear complexes were determined and their speciation diagrams were evaluated. Binuclear complexes involving 4,4'-bipiperidine linkage of two Pd(en)$^{2+}$ species were investigated. The binding of DNA constituents to the binuclear complex was studied.

Keywords: Palladium(II) complexes; 4,4'-bipiperidine; DNA constituents; Binuclear complexes; Equilibrium constants.

172. Synthesis, Characterization, Equilibria and Biological Activity of Dimethyltin(IV) Complex With 1,4-Piperazine

Mohamed R. Shehata, Mahmoud M.A. Mohamed and Mohamed M

The interaction of dimethyltin(IV) dichloride (DMT) with 1,4-piperazine (PIP) was investigated. The complex formation equilibria of the complexes formed in solution were investigated. The stoichiometry and stability constants of the complexes formed in solution phase were determined at different temperatures and in solutions of dioxane–water mixtures of different dielectric constants. The equilibrium constant for the displacement of piperazine coordinated to dimethyltin(IV) by inosine as a representative of DNA was calculated. $(DMT)(PIP) \cdot 3H_2O$ was synthesized and characterized by elemental analysis, spectral, and thermal techniques. The antitumor activity of the complex was screened.
Keywords: Organotin(IV) Complexes; 1,4-Piperazine; Equilibrium constants; Effect of temperature; Effect of solvent; Antitumor activity.

173. Thermal Stability of Pd(1,4-Bis(2-Hydroxyethyl)Piperazine)Cl2 and its Role in the Catalysis of Base Hydrolysis of A-Amino Acid Esters

Mohamed R. Shehata, Mohamed M. Shoukry, Shokry A. Shokry and Mahmoud A. Mabrouk

Pd(BHEP)Cl2 was synthesized and characterized (BHEP = 1,4-bis(2-hydroxyethyl)piperazine). The complex decomposes in two steps, leaving a residue of palladium metal. Amino acid ester (L) reacts with $[Pd(BHEP)(H_2O)_2]^{2+}$ (BHEP = 1,4-bis(2-hydroxyethyl)piperazine), giving mixed-ligand complexes, $[Pd(BHEP)L]^{2+}$. The kinetics of hydrolysis of $[Pd(BHEP)L]^{2+}$ have been studied by pH-stat technique, and rate constants were obtained. Rate acceleration observed for glycine methyl ester is high. The effect with methionine methyl ester is much less marked, as the mixed-ligand complexes with these ligands do not involve alkoxycarbonyl donors. Possible mechanisms for these reactions are considered.
Keywords: 1,4-Bis(2-Hydroxyethyl) piperazine; Thermal Stability; Amino acid ester hydrolysis; Pd(II); PH-stat technique.

174. Electrodeposition of Ni–GNS–TIO$_2$ Nanocomposite Coatings as Anticorrosion Film For Mild Steel in Neutral Environment

M.W. Khalil, Taher A. Salah Eldin, H.B. Hassan, Kh. El-Sayed and Z. Abdel Hamid

In this article nanocomposites of graphene nanosheets–anatase titanium dioxide (GNS–TiO$_2$) were prepared via hydrothermal method. In this method graphene oxide (GO) was reduced to graphene nanosheets (GNS) simultaneously with anatase (TiO$_2$) growth in situ on the graphene nanosheet (GNS) surface. The resulting GNS–TiO$_2$ nanocompositewas characterized using X-ray diffraction (XRD), high resolution transmission electron microscopy (HR-TEM), X-ray photoelectron spectroscopy (XPS) and Fourier transform infrared (FTIR). The percentage of TiO2 in the prepared GNS–TiO$_2$ was determined by thermo gravimetric analysis technique (TGA). The fabricated GNS–TiO$_2$ nanocomposite was codeposited with Ni by electrodeposition technique and used as a protective film for mild steel used in construction of steel silos. Different operating conditions for the deposition process were adopted to obtain Ni–GNS–TiO$_2$ nanocomposite coatings with good morphological properties. The Ni–GNS–TiO$_2$ nanocomposite coatings were characterized using a field emission scanning electron microscope (FE-SEM) and energy dispersive X-ray analysis (EDX). Moreover, Ni–GNS–TiO$_2$ nanocomposite coatings were subjected to different electrochemical and mechanical tests to evaluate their corrosion behavior and hardness in comparison with that of pure Ni coating. It was found that the corrosion rate of the Ni–GNS– TiO$_2$/mild steel electrodes decreases and the microhardness increases with increasing the wt.% of GNS–TiO$_2$ nanocomposite in the prepared electrodes. The best corrosion resistance value of 33.1 kO cm2 and relatively high hardness value of 478 HV were recorded for the composite coating electrode that contains 20.4 wt.% GNS–TiO2 compared with the other composite coating electrodes or pure Ni coatings.
Keywords: Mild steel silos; Graphene nanosheets (GNS); Nanocomposite; Corrosion; Electrodeposition technique.

175. Multi-Walled Carbon Nanotube and Nanosilica Chemically Modified Carbon Paste Electrodes for the Determination of Mercury(II) in Polluted Water Samples

Tamer Awad Ali and Gehad G. Mohamed

Novel carbon paste ion selective electrodes based on the 1,4-bis(6-bromohexyloxy)benzene (BHOB) ionophore were constructed in order to determine the Hg(II) ion concentration. Multi-walled carbon nanotubes (MWCNTs) and nanosilica modifiers were used for improving the response characteristics of mercury carbon paste sensors. MWCNTs have good conductivity which helps the transduction of the signal in carbon paste electrodes. These potentiometric sensors respond to Hg(II) ions in wide linear concentration ranges of 1×10^{-1} to 1.0×10^{-7} and 1.0×10^{-1} to 1.8×10^{-8} mol L^{-1} with Nernstian slopes of 28.75 ± 0.46 and 29.92 ± 0.15 mV decade^{-1} of Hg(II) ions and detection limits of 1×10^{-7} and 1.8×10^{-8} mol L^{-1} for the MWCNT-CPE (electrode V) and MWCNT/nanosilica-CPE (electrodeVII), respectively. The electrodes were pH independent within the ranges of 3.0–7.5 and 2.5–8.5, with a fast response time of about 7 and 4 s, and can be used for at least 110 and 145 days without any considerable divergence in the potentials of electrode (V) and electrode (VII), respectively. The proposed sensors thus allowed a sensitive, selective, simple, low-cost, and stable electrochemical response to Hg(II) ions in the presence of a large number of alkali, alkaline earth, transition and heavy metal ions. Such abilities promote new opportunities for determining Hg(II) ions in a wide range of real samples. The results obtained were compared with those obtained

using inductively coupled plasma atomic emission spectrometry (ICP-AES).

Keywords: Potentiometric sensors; Mercury determination; Multi-walled carbon nanotube (MWCNTS); Nanosilica; Water samples.

176. Biorenewable Polymer Composites from Tall Oil-Based Polyamide and Lignin-Cellulose Fiber

Kunwei Liu, Samy A. Madbouly, James A. Schrader, Michael R. Kessler, David Grewell and William R. Graves

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Tall oil-based polyamide (PA) was blended with lignin-cellulose fiber (LCF), an inexpensive, highly abundant byproduct of the pulp and paper industries, to produce environmental-friendly thermoplastic biocomposites. The effects of the concentration of LCF on the thermal, rheological, and mechanical properties of the composites were studied using differential scanning calorimetry (DSC), dynamic mechanical analysis (DMA), thermogravimetric analysis (TGA), rheological testing, and mechanical testing. The morphologies of the composites were investigated using scanning electron microscopy (SEM). The incorporation of LCF did not change the glass relaxation process of the polyamide significantly. Results from rheological testing showed that the complex viscosity and shear storage modulus were increased by LCF. Both the modulus and strength increased with increasing LCF content; however, LCF substantially reduced the tensile elongation of the composites. The thermal stability of the composites was strongly influenced by the concentration of LCF. The onset of the degradation process shifted to lower temperatures with increasing LCF content. We conclude that LCF has strong potential for use as filler that is compatible with tall oil-based polyamide. Adding LCF to form PA-LCF composites can lower material costs, reduce material weight, and increase strength and rigidity compared to neat PA. Composites of PA-LCF could serve as sustainable replacements for petroleum plastics in many industrial applications and would provide additional opportunities to utilize LCF, a highly abundant biorenewable material.

Keywords: Biomaterials; Biopolymers and renewable polymers; Blends; Composites; Differential scanning calorimetry (DSC).

177. Processing and Characterization of Bio-Based Poly (Hydroxyalkanoate)/Poly (Amide) Blends: Improved Flexibility and Impact Resistance of Pha-Based Plastics

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One of the most significant limitations to widespread industrial implementation of emerging bioplastics such as poly(lactic acid) and poly(hydroxyalkanoate) (PHA) is that they do not match the flexibility and impact resistance of petroleum-based plastics like poly(propylene) or high-density poly(ethylene). The basic goal of this research is to identify alternative, affordable, sustainable, biodegradable materials that can replace petroleum-based polymers in a wide range of industrial applications, with an emphasis on providing a solution for increasing the flexibility of PHA to a level that makes it a superior material for bioplastic nursery-crop containers. A series of bio-based PHA/poly(amide) (PA) blends with different concentrations were mechanically melt processed using a twin-screw extruder and evaluated for physical characteristics. The effects of blending on viscoelastic properties were investigated using small-amplitude oscillatory shear flow experiments to model the physical character as a function of blend composition and angular frequency. The mechanical, thermal, and morphological properties of the blends were investigated using dynamic mechanical analysis, differential scanning calorimetry, thermogravimetric analysis, scanning electron microscopy, and tensile tests. The complex viscosity of the blends increased significantly with increasing concentration of PHA and reached a maximum value for 80 wt % PHA blend. In addition, the tensile strength of the blends increased markedly as the content of PHA increased. For blends containing PA at >50 wt %, samples failed only after a very large elongation (up to 465%) without significant decrease in tensile strength. The particle size significantly increased and the blends became more brittle with increasing concentration of PHA. In addition, the concentration of the PA had a substantial effect on the glass relaxation temperature of the resulting blends. Our results demonstrate that the thermomechanical and rheological properties of PHA/PA blends can be tailored for specific applications, and that blends of PHA/PA can fulfill the mechanical properties required for flexible, impact-resistant bio-based nursery-crop containers.

Keywords: Biodegradable; Bioengineering; Biopolymers & renewable polymers; Blends.

178. in Situ Polymerization of Bio-Based Thermosetting Polyurethane/Graphene Oxide Nanocomposites

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Journal of Applied Polymer Science, 132: 1-8 (2015) IF: 1.768

Novel bio-based polyurethane/graphene oxide (GO) nanocomposites have been successfully synthesized from biorenewable epoxidized soybean-castor oil fatty acid-based polyols with considerable improvement in mechanical and thermal properties. The GO was synthesized via a modified pressurized oxidation method, and was investigated using Raman spectra, AFM and XPS, respectively. The toughening mechanism of GO in the bio-based polyurethane matrix was explored. The elongation at break and toughness of polyurethane were increased by 1.3 and 0.8 times with incorporation of 0.4 wt % GO, respectively. However, insignificant changes in both mechanical strength and modulus were observed by adding GO. The results from thermal analysis indicated that the GO acts as new secondary soft segments in the polyurethane which lead to a considerable decrease in the glass transition temperature and crosslink density. The SEM morphology of the fracture surface after tensile testing showed a considerable aggregation of graphene oxide at concentrations above 0.4 wt %. VC.

Keywords: Biopolymers & renewable polymers; Composites; Graphene and fullerenes; Mechanical properties; Nanotubes; Thermal.

179. Electrochemistry and Detection of Dopamine At A Poly(3,4-Ethylenedioxythiophene) Electrode Modified With Ferrocene and Cobaltocene

Nada F. Atta, Ahmed Galal, Shimaa M. Ali and Samar H. Hassan

Ionics, 21(8): 2371-2382 (2015) IF: 1.754

Poly(3,4-ethylenedioxythiophene) (PEDOT) modified with ferrocene carboxylic acid (FC1), ferrocene (FC2), and cobaltocene (CC) is introduced as a sensor electrode. FC or CC was Bsandwiched^ between two layers of PEDOT in the presence of sodium dodecyl sulfate (PEDOT/mediator/ PEDOT…SDS). The composite electrodes were evaluated for the electrocatalytic oxidation of dopamine (DA). The FC1 mediator showed the highest rate for electron transfer and enhanced electrocatalytic activity. This is due to the inclusion of the ferrocenium ion and the polar substituted –COOH group in the matrix which increases the electronic conduction of the film. SDS enhanced the preconcentration/accumulation of DA ions at the surface that resulted in enhanced detection. Detection limit in human urine was 0.069 μmol L^{-1} in the linear dynamic range of 6–300 μmol L^{-1}, with satisfying recovery results. The PEDOT/FC1/PEDOT…SDS composite was used for simultaneous determination of dopamine in the presence of ascorbic acid (AA) and uric acid (UA).
Keywords: PEDOT; Dopamine; Ferrocene; Mediator; Sodiumdodecyl sulfate.

180. Synthesis, Spectroscopic Studies, Thermal Analyses, Biological Activity of Tridentate-Coordinated Transition-Metal Complexes [M(L)X$_2$] and Crystal Structure of [ZnBr$_2$(2,6-Bis(Tert-Butylthiomethyl)Pyridine)]

Hanan F. AbdEl-Halim, Gehad G. Mohamed, Kathrin Hofmann and Barbara Albert

Comptes Rendus Chimie, 18: 619-625 (2015) IF: 1.713

A new terdentate acyclic pincer ligand, 2,6-bis(tert-butylthiomethyl)pyridine (tbtmp), was synthesized and reacted with several complexes of iron, zinc, nickel, cobalt, and copper. The ligand and its coordination compounds were characterized using elemental analysis, infrared, ^{1}H- and ^{13}C-NMR-spectroscopy, thermal analyses, plus—for the Zn complex—single-crystal X-ray diffractometry. The structure of [Zn(L)Br$_2$] was solved in the tetragonal crystal system, chiral space groups P41212 and P4$_3$2$_1$2 (No. 92 and No. 96, a = 947.2(1) pm, c = 2265.2(5) pm), revealing five-fold coordination of the metal atoms. According to spectroscopy, all complexes share the same coordination environment around the metal atoms, consisting of two halide anions and a sulfur-methylene-pyridine-methylene-sulfur entity; tbtmp acts as a tridentate ligand with the pyridine N atom and both tert-butylthio S atoms coordinating to the metal ions (NS2). The analysis results indicate that the metal ions are coordinated as distorted pseudo-bipyramids, LMX2, with the chelate ligand meridionally arranged. One of the complexes contains ethanol as an additional ligand, resulting in a pseudo-octahedral coordination sphere [Ni(L)Cl$_2$EtOH]. The latter was obtained in the form of green crystals, which turn into a red powder with loss of the ethanol molecule. Fe (III), Co(II), Ni(II) and Cu(II) metal complexes [M(L)Cl$_2$] were screened for their antibacterial activity against B. subtilis G(+) and Escherichia coli G() bacteria, and fungus (Candida albicans and Aspergillus flavus).
Keywords: 2,6-Bis (Tert-Butylthiomethyl) Pyridine; Metal complexes; Spectroscopy; Crystal structure; Biological activity.

181. Synthesis and Characterization of Cationic Surfactants Based on N-Hexamethylenetetramine as Active Microfouling Agents

Rafat M. Mohareb, Abdelfatah M. Badawi, Mahmoud R. Noor El-Din, Nesreen A. Fatthalah and Marian R. Mahrous

J Surfact Deterg, 18: 529-535 (2015) IF: 1.685

Four cationic surfactants of quaternary hexammonium silane chloride based on hexamethylenetetramine and alkyl chloride were synthesized. The chemical structures of the prepared cationic surfactants were elucidated using Fourier transform infrared (FT-IR) spectroscopy and mass spectrometry analysis. The surface and thermodynamic properties of the prepared surfactants were also studied. The performance of these cationic surfactants as microfouling agents against two strains of Gram-negative bacteria, namely, Pseudomonas aeruginosa and Escherichia coli, and two strains of Gram-positive bacteria,namely, Staphylococcus aureus and Bacillus subtilis, wereevaluated as antimicrobial agents. The results showed thatthe maximum antimicrobial activity was detected for Nhexamethylenetetramine-N-ethyl silane ammonium trichloride(Ah). The maximum and minimum antimicrobialactivities were 73 and 60 % against S. aureus and E. coli,respectively, at a concentration of 5 mg/l, pH 7, and 37 ^{0}C.
Keywords: Microbial fouling quaternary; Hexammonium silane cationic surfactants antimicrobial.

182. Improvement of the Photovoltaic Characteristics of Industrially Fabricated Solar Cells by Chemical Etching of the Si Surface

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Journal of Solar Energy Engineering, 137: 41007-41007 (2015) IF: 1.614

The efficiency of industrially fabricated solar cells and hence the power of the solar modules are affected by the surface treatment of the Si-wafers during solar cell fabrication. Surface etching and formation of definite porous structure increase the effective photon flux absorption and lead to higher solar conversion efficiency. Metal-assisted etching of p-Si in aqueous hydrofluoric acid, HF, solutions containing oxidizing agents like potassium bromate, KBrO$_3$, potassium iodate, KIO$_3$, or potassium dichromate, K$_2$Cr$_2$O$_7$, are used for the preparation of well-defined pores. The concentration of both HF and the oxidizing agent and also the time of etching have to be optimized. The electro-less deposition of ideal metal nano particles like, Pt or Pd enhances pore formation. The effect of oxidizing agent and its concentration on the main characteristics of the prepared solar cells are investigated and discussed. A comparison with alkali surface treatment with KOH/isopropanol aqueous solution is also considered. In this respect, the manufacturing processes and the tests of the cell are performed in the ARAB INTERNATIONAL OPTRONICS (EGYPT). The morphology of the wafer surfaces is

investigated by scanning electron microscopy (SEM) and I-V characteristics of the fabricated cells are investigated by M54A solar tester.

Keywords: Chemical etching; Metal-assisted etching; Potassium hydroxide/isopropanol etching; porous silicon layers; Surface morphology.

183. Synthesis, Structural Characterization, in Vitro Antimicrobial and Anticancer Activity Studies of Ternary Metal Complexes Containing Glycine Amino Acid and the Anti-Inflammatory Drug Lornoxicam

Walaa H. Mahmoud, Gehad G. Mohamed and Maher M.I. El-Dessouky

Mixed ligand complexes were synthesized using lornoxicam (LOR) as the primary ligand and glycine amino acid (HGly) as the secondary ligand. They were characterized by FT-IR, UV–Vis, mass, 1H NMR, ESR spectral studies, TG–DTG, X-ray powder diffraction and physical analytical studies. From the molar conductance, magnetic moment and electronic spectral data of the synthesized complexes, general formulae of $[M(LOR)_2(Gly)].Xn.yH_2O$ whereM = Cr(III) (X = Cl, n = 2, y = 3), Mn(II) (X = Cl, n = 1, y = 1), Co(II) (X = BF_4, n = 1, y = 0), Ni(II) (X = Cl, n = 1, y = 0), Cu(II) (X = BF_4, n = 1, y = 2) and Zn(II) (X = BF_4, n = 1, y = 2) and (M = Fe(II) (X = BF_4, n = 1, y = 1) and Fe(III) (X = Cl, n = 2, y = 1) with an octahedral structure were proposed. Thermal analyses show that the complexes lose water molecules of hydration initially and subsequently expel anionic parts and organic ligands in continuous steps. The kinetic parameters namely E, DH/, DS/ and DG/ illustrate the spontaneous association of the metal and ligands in the formation of the complexes. The antimicrobial efficiency of the LOR and HGly ligands and the ternary complexes were examined by in vitro method against various pathogenic bacterial and fungal strains. The metal complexes were found to possess efficient antimicrobial properties compared to lornoxicam and most of these complexes could turn out to be excellent models for the design of effective antibiotic drug substances. Also, the two ligands, in comparison to ternary metal complexes are screened for their anticancer activity against breastic cancer cell line. The results showed that the metal complexes be more active than the parent LOR and glycine free ligands except Cr(III) ternary complex which was found to be inactive.

Keywords: Lornoxicam; Mixed metal Complexes; Spectroscopy; TG–DTG; X-ray powder diffraction; Anticancer activity.

184. Synthesis, Spectroscopic, Thermogravimetric and Antimicrobial Studies of Mixed Ligands Complexes

Walaa H. Mahmoud, Nessma F. Mahmoud, Gehad G. Mohamed, Adel Z. El-Sonbati and Ashraf A. El-Bindary

An interesting series of mixed ligand complexes have been synthesized by the reaction of metal chloride with guaifenesin (GFS) in the presence of 2-aminoacetic acid (HGly) (1:1:1 molar ratio). The elemental analysis, magnetic moments, molar conductance, spectral (UV–Vis, IR, ^{1}H NMR and ESR) and thermal studies were used to characterize the isolated complexes. The molecular structure of GFS is optimized theoretically and the quantum chemical parameters are calculated. The IR showed that the ligand (GFS) acts as monobasic tridentate through the hydroxyl, phenoxy etheric and methoxy oxygen atoms and co-ligand (HGly) as monobasic bidentate through the deprotonated carboxylate oxygen atom and nitrogen atom of amino group. The molar conductivities showed that all the complexes are non-electrolytes except Cr(III) complex is electrolyte. Electronic and magnetic data proposed the octahedral structure for all complexes under investigation. ESR spectrum for Cu(II) revealed data which confirm the proposed structure. Antibacterial screening of the compounds were carried out in vitro on gram positive (Bacillus subtilis and Staphylococcus aureus), gram negative (Escherichia coli and Neisseria gonorrhoeae) bacteria and for in vitro antifungal activity against Candida albicans organism. However, some complexes showed more chemotherapeutic efficiency than the parent GFS drug. The complexes were also screened for their in vitro anticancer activity against the breast cell line (MFC7) and the results obtained showed that they exhibit a considerable anticancer activity.

Keywords: Ternary complexes; Thermal analysis; Antimicrobial activity.

185. Supramolecular Structural, Thermal Properties and Biological Activity of 3-(2-Methoxyphenoxy) Propane-1,2-Diol Metal Complexes

Walaa H. Mahmoud, Nessma F. Mahmoud, Gehad G. Mohamed, Ashraf A. El-Bindary and del Z. El-Sonbati

New bi- and trivalent transition metal complexes of ligand 3-(2-methoxyphenoxy)propane-1,2-diol (GFS) were synthesized. The ligand and complexes were characterized via: melting point, UV/Visible, IR, 1H NMR, mass and diffused reflectance spectroscopy. The molecular structure of the investigated ligand (GFS) is optimized theoretically and the quantum chemical parameters are calculated. In addition, the complexes were characterized based on conductivity measurement, thermal analysis and biological activity. The infrared spectral study of GFS and its complexes, act as monobasic tridentate through the oxygen atom of hydroxyl group and two etheric oxygen atoms. Also, coordination to the unprotonated oxygen is evidenced from the disappearance of the OH signal in the ^{1}H NMR spectra after complexation. The thermogravimetric analysis of the complexes shows metal oxide remaining as the final product. The compounds were tested against four bacterial species; two Gram positive bacteria (Bacillus subtilis and Staphylococcus aureus) and two Gram negative bacteria (Escherichia coli and Pseudomonas aeruginosa) as well as antifungal activity against (Candida albicans). The complexes showed significant activities against Gram positive bacteria than Gram negative bacteria. $[Cd(GFS)Cl(H_2O)_2]$ complex showed remarkable antifungal activity. However, some complexes showed more chemotherapeutic efficiency than the parent GFS drug. The drug and complexes were also screened for their in vitro anticancer activity against the Breast cell line (MFC7) and the results obtained show that they exhibit a considerable anticancer activity.

186. Sparfloxacin Charge Transfer Complexes With 2,3-Dichloro5,6-Dicyano-1,4-Benzoquinone and Tetracyanoquinodimethane: Molecular Structures, Spectral, and DFT Studies

Ola R. Shehab and Ahmed M. Mansour

A simple, sensitive and rapid method was developed for the quantitative analysis of sparfloxacin in its pharmaceutical formulations through the formation of charge transfer complexes with p-acceptor systems. The Lambert-Beer's law was obeyed in the concentration ranges of 7-70 and 10-50 µg/mL sparfloxacin for 2,3-dichloro-5,6-dicyano-1,4-benzoquinone and tetracyanoquinodimethane. Structural characterization of the isolated solid CT complexes was carried out by IR, ^{1}H NMR, UV-Vis. and MS. The experimental studies were complemented by quantum chemical calculations at DFT level of theory . The electronic structures were investigated by TD-DFT calculations. Natural bond orbital analysis and molecular electrostatic potential maps were helpful in assigning the CT route. The formation constant, molar extinction coefficient, oscillator strength, dipole moment, standard free energy and ionization potential were calculated.

Keywords: Pharmaceutical analysis; Fluoroquinolone; Charge transfer; MEP.

187. Cytotoxic and Antimicrobial Evaluations of Novel Apoptotic and Anti-Angiogenic Spiro Cyclic 2-Oxindole Derivatives of 2-Amino-Tetrahydroquinolin-5-One

Said A. S. Ghozlan, Magda F. Mohamed, Ahmed G. Ahmed, Samia A. Shouman, Yasmin M. Attia and Ismail A. Abdelhamid

A novel series of cyclic 2-oxindole derivatives incorporating 2-amino-tetrahydroquinolin-5-one were prepared. The structures of the prepared compounds were elucidated using different spectral tools. The regio-orientation of the reaction products was elucidated through NOE difference experiments and through using substituents on the ortho position to affect further cyclization. Antitumor and antimicrobial evaluations were performed on the prepared compounds. Most of these compounds exhibited high to moderate antimicrobial activity. With respect to the antitumor activity, the compounds showed more potent cytotoxic effect only toward the human breast cancer cell line MCF-7. Also, we found that derivatives containing an ester group (8c, 11b, 14b, and 15b) are more active than those containing a cyanide group (8a, 11a, 14a, and 15a). Moreover, compounds 15b and 8b are the most active derivatives in this group. These two compounds showed apoptotic inhibition of the proliferation of human breast adenocarcinoma MCF-7 cells through DNA fragmentation, induction of the tumor suppressor protein p53, induction of caspase-9, and finally the inhibition of angiogenesis by decreasing vascular endothelial growth factor expression and secretion.

188. New Coumarin Derivatives as Potent Selective COX-2 Inhibitors: Synthesis, Anti-Inflammatory, QSAR, and Molecular Modeling Studies

Dina H. Dawood, Rasha Z. Batran, Thoraya A. Farghaly, Mohammed A. Khedr and Mohamed M. Abdulla

Two new series of coumarin derivatives incorporating thiazoline and thiazolidinone moieties were designed, synthesized, and investigated in vivo for their anti-inflammatory activities using the carrageenan-induced rat paw edema model and in vitro for their inhibitory activities against the human cyclooxygenase (COX)-1 and COX-2 isoforms. Most of the synthesized compounds demonstrated exceptionally high in vivo anti-inflammatory activity and displayed superior GI safety profiles (0–7% ulceration) as compared to indomethacin. All the bioactive compounds showed in vitro high affinity and selectivity toward the COX-2 isoenzyme, compared to the reference celecoxib with IC50 values ranging from 0.31 to 0.78mM. The ethyl thiosemicarbazone 2b, thiazoline derivatives 3a, 3b, 5b, 6a, and 7f, and the thiazolidinone compounds 8b and 9a showed the highest in vivo and in vitro antiinflammatory activities with remarkable COX-2 selectivity. Quantitative structure–activity relationship study (QSAR) was done and resulted in a highly predictive power R2 (0.908). A molecular docking study revealed a relationship between the docking affinity and the biological results.

Keywords: Anti-inflammatory; COX-2 inhibitors; Molecular docking; QSAR; Thiazolylcoumarin.

189. A Novel Electrochemical Sensor for Paracetamol Based on β-Cyclodextrin/ Nafion®/ Polymer Nanocomposite

Nada F. Atta, Ahmed Galal and Dalia M. El-Said

A sensitive electrochemical sensor based on β -cyclodextrin/ Nafion®/ poly(3,4-ethylene-dioxythiophene) nanocomposite modified gold electrode Au/PEDOT/NF/CD was fabricated for the determination of paracetamol ACOP in presence of interference compounds. Au/PEDOT/NF/CD showed an excellent electrocatalytic synergism between its components for the electrooxidation of ACOP. Conductive PEDOT polymer film acts as an electron mediator with a rich electron cloud. Furthermore nafion improves the electrical conductivity of the composite as well it works as suitable layer for the formation of the CD film over it due to its good adhesion at the polymer surface and good film forming ability. By the modification of Au/PEDOT/NF with CD film, enhanced charge transfer kinetics and improved oxidation current for ACOP were obtained. A supramolecular host-guest inclusion complex is formed between β-CD and ACOP via electrostatic, inclusion interactions and hydrogen bonds formation. The formation of such complex resulted in selective advantage and enhancement of the charge transfer properties of ACOP. ACOP molecules penetrate into the less polar cavity of β-

CD and ACOP:CD inclusion complex was formed which further resulted in significant increase in oxidation signal of ACOP. Under optimized conditions a linear calibration curve was obtained for the determination of ACOP in urine within the range 3–300 µmol L-1, with a correlation coefficient of 0.9958 and detection limit of 36.1nmol L-1. Simultaneous determinations of ACOP and epinephrine (EP), ACOP and norepinephrine (NE), ACOP, DA and AA and ACOP, EP and AA were achieved at the modified sensor with high resolution and good potential peak separation.

Keywords: Paracetamol; Nafion; Host-guest complex; Cyclodextrin; Electrochemical sensor; Synergism.

190. Electrochemical Sensor for Morphine Based on Gold Nanoparticles/ Ferrocene Carboxylic Acid/Poly (3,4-Ethylene-Dioxythiophene) Composite

Nada F. Atta, Ahmed Galal and Samar H. Hassan

An electrochemical sensors were prepared from different mediators namely ferrocene carboxylic acid (FC1), ferrocene (FC2) and cobaltcene (CC) sandwiched between two layers of poly (3,4-ethylene-dioxythiophene) PEDOT and gold nanoparticles (PEDOT/Mediator/Aunano). The performance of the mediator in these different composites was evaluated for the electrocatalytic oxidation of morphine (MO). The results showed that FC1 mediator possesses higher rate for electron transfer and enhanced electrocatalytic activity due to the inclusion of the ferrocenium ion and the polar substituted–COOH group in the conducting polymer matrix which increases the electronic conduction of the film. Excellent performance of (PEDOT/FC1/ Aunano) modified electrode with low detection limit of 21 nmol L-1 in the linear dynamic range 5-300 µmol L-1 for the determination of MO in human urine samples with satisfying recovery results was obtained. Furthermore, the PEDOT/FC1/Aunano composite was successfully used for simultaneous determination of tertiary mixture of morphine, ascorbic acid (AA) and uric acid (UA) and binary mixtures of morphine/ascorbic acid (AA) and morphine/dopamine.

Keywords: Pedot; Morphine; Ferrocene carboxylic acid; Gold nanoparticles; Dopamine.

191. Sensitive Electrochemical Determination of Pantoprazole Sodium in Pure form Pharmaceutical Formulations and Biological Fluid at Glassy Carbon Electrode Using Differential Pulls and Square Wave Techniques

Abeer M. Elsied H and Gehad G.Mohamed

The electrochemical behavior of pantoprazole sodium (PNT) was investigated by cyclic voltammetry, differential pulse and square wave techniques at a glassy carbon electrode in Britton-Robinson electrolyte (pH= 8).They gave one irreversible anodic oxidation diffusion controlled peak at 833 mV. The effect of experimental parameters has been examined. The oxidation peak current varied linearly with the concentration over the range of 0.5 - 7.5 µM (r =

0.999) and 0.675 – 4.375 µM (r = 0.992) for differential pulse voltammetry (DPV) and square wave voltammetry (SWV), respectively. The limits of detection and quantification were found to be 0.0318 and 0.106 µM (S/N = 3) for DPV and 0.0076 and 0.2535 µM (S/N = 10) for SWV, respectively. The proposed DPV and SWV methods have been applied with satisfactory results to the determination of pantoprazole sodium in pharmaceutical dosage forms and humane urine. Good analytical results being obtained upon comparison with the official method

Keywords: Pantoprazole sodium (PNT); Cyclic voltammetry (CV); Differential pulse voltammetry (DPV); Square wave voltammetry (SWV) Glassy carbon electrode; Pharmaceuticals; Urine samples.

192. Design and Construction of New Potentiometric Sensors For Determination of Copper(II) Ion Based on Copper Oxide Nanoparticles

Tamer Awad Ali, Gehad G. Mohamed and Ahmed R. Othman

New chemically modified carbon paste (CPEs) and screen-printed electrodes (SPEs) were fabricated incorborating copper oxide nanoparticles (CuO NPs) as a neutral ionophore and explored as Cu(II) selective electrodes. The electrodes were found to display Nernstian response over Cu(II) concentration of 5.3×10^{-7} to 1×10^{-2} and 6.1×10^{-8} to 1×10^{-2} mol L^{-1}. The detection limits were found to be 5.3×10^{-7} and 6.1×10^{-8} mol L^{-1} for modified carbon paste (MCPEs; electrodes I and II) and screen-printed electrodes (MSPEs; electrodes III and IV), respectively. The MCPEs with dibutylphthalate (DBP) (electrode I) and tricresylphosphate (TCP) (electrode II) as plasticizers were found to have slope values of 29.65±0.30 and 28.99±0.60 mV decade-1, respectively. Also, the MSPEs with DBP (electrode III) and TCP (electrode IV) plasticizers showed Nernstian slopes of 30.01±0.20 and 29.35±0.40 mV decade-1, respectively. The electrodes have fast response time (8, 10, 5 and 7s for electrodes I, II, III and IV, respectively) and good selectivity with respect to different interfering ions. The fabricated electrodes were satisfactory applied to determine Cu(II) ion in pure solutions and different real spiked water samples using the proposed potentiometric method. The results obtained applying MCPEs and MSPEs agree well with the inductively coupled plasma atomic emission spectrometry (ICP-AES).

Keywords: Copper determination; Copper oxide nanoparticles ionophore; Modified screen-printed electrodes; Modified carbon paste electrodes.

193. Highly Selective Potentiometric Determination of 1-Dodecyl-5-Methyl-1H-Benzo[D][1,2,3]Triazol-1-Ium Bromide Surfactant in Polluted Water Samples Using 1,4-Bis- (8-Mercaptooctyloxy)- Benzene Ionophore

Tamer Awad Ali, Gehad G. Mohamed, Maher M. El-Dessouky and Ragheb M. Ragheb

Sensitive potentiometric sensors for determination of 1-dodecyl-5-methyl-1H-benzo[d][1,2,3]triazol-1-ium bromide (DMTB) have been constructed. The fabricated modified carbon paste electrodes (MCPE) are based on 1,4-bis-(8-mercaptooctyloxy)-benzene as sensing ionophore. Electrode matrices compositions were optimized referring to the effect of nature and content of the sensing ionophore and plasticizer. The electrodes displayed a linear potential response over wide concentration range from 2.6×10^{-7} to 1×10^{-2} and 1.4×10^{-7} to 1×10^{-2} mol L^{-1} with Nernstian slopes of 59.33 ± 0.27 and 58.59 ± 1.31 mV decade-1 of DMTB cation concentration with a detection limit of 2.6×10^{-7} and 1.4×10^{-7} mol L^{-1} for MCPEs with dibutylphthalate (DBP) (sensor I) and o-nitrophenyloctylether (o-NPOE) (sensor II) as plasticizers, respectively. DMTB in the analytical grad solutions has been successfully determined via potentiometric titration using the MCPEs as indicator electrodes, with a potential jump amount to 498 mV. The optimized sensors (I and II) were used successfully for direct and indirect determination of DMTB species in different spiked real water samples with satisfactory results. The obtained results with MCPEs are compared with those obtained with two phase titration method with satisfactory agreement.

Keywords: 1-Dodecyl-5-methyl-1H-benzo[D][1,2,3]Triazol-1-Ium Bromide Surfactant; Modified carbon paste sensor; Different water samples.

194. Development of A New Modified Screen-Printed and Carbon Paste Electrodes for Selective Determination of Cetyltrimethylammonium Bromide in Different Water Samples

Tamer Awad Ali, M. H. Soliman, Gehad G. Mohamed, A.B. Farag and Mahmoud K. Samah

Cetyltrimethylammonium bromide (CTAB)-selective electrodes of the types carbon paste (CPE) and screen-printed sensors (SPE) based on incorporation of zeolite ionophore have been constructed. The influences of paste composition, temperature, pH of the test solution, and foreign ions on the electrodes performance were investigated. The electrodes showed Nernstian behavior with linear concentration range of $4.61 \times 10^{-7} - 1.0 \times 10^{-2}$ and $1.26 \times 10^{-7} - 1.0 \times 10^{-2}$ mol L^{-1}, slope of 57.56 ± 1.25 and 58.92 ± 0.27 mV decade-1 and lower limit of detection of 4.61×10^{-7} and 1.26×10^{-7} mol L^{-1} for modified CPE and SPE sensors, respectively. The electrodes display good selectivity for CTAB with respect to a number of common foreign inorganic and organic species. The response is not affected by pH variation between 2.0 - 8.5 and 2.0 – 9.0 for modified CPE and SPE, respectively. The sensors were successfully used for determination of CTAB both in pure solution and in different spiked real water samples. The frequently used CTAB of analytical and technical grade as well as different water samples has been successfully titrated and the results obtained agreed with those obtained with standard two phase titration method. The sensitivity of the proposed method is comparable with the official method and ability of field measurements.

Keywords: Cetyltrimethylammonium bromide; Modified screen-printed; Modified carbon paste; Zeolite ionophore; Selectivity coefficient; Different water samples.

195. Improved Determination of Mebeverine Hydrochloride in Urine, Serum and Pharmaceutical Preparations Utilizing A Modified Carbon Paste Electrode

Tamer Awad Ali, Gehad G. Mohamed, M. M. Omar and Veronia N. Abdrabou

A simple, rapid and sensitive method for the determination of mebeverine hydrochloride (MBHCl) in urine, serum and pharmaceutical preparations using modified carbon paste electrodes was developed. The electrochemical sensors showed a linear dynamic range of $3.0 \times 10^{-7} – 1.0 \times 10^{-2}$ and $1.0 \times 10^{-7} – 1.0 \times 10^{-2}$ mol L^{-1} with detection limit of 3.0×10^{-7} and 1×10^{-7} mol L^{-1} for modified carbon paste (MCPEs; sensors I and II), respectively. The slopes of the calibration graphs are 56.78 ± 0.85 and 58.80 ± 0.46 mV decade-1 for MCPEs with tricresylphosphate (TCP) (sensor I) and o-nitrophenyloctylether (o-NPOE) (sensor II) as plasticizers, respectively. The response time was relatively quick in the whole concentration range (8 and 7 s), respectively. The electrodes can be used at least 65 and 73 days without observing any deviations in a pH range of 2.0–8.0 and 1.5–8.0 for electrodes I and II, respectively. The fabricated electrodes displayed good selectivity for MBHCl with respect to number of common foreign inorganic cations, sugar species, and glycine as the fillers that may be added to the pharmaceutical preparation. Fortunately, such materials mostly do not interfere. The sensors were successfully applied for the determination of MBHCl in its tablets, urine and serum. The results obtained using these potentiometric electrodes were comparable with those obtained using official method

Keywords: Mebeverine ion-selective electrodes; Modified carbon paste sensors; Pharmaceutical preparations; Urine; Serum.

196. Electroanalytical Studies on Fe(III) Ion-Selective Sensors Based on 2-Methyl-6-(4-Methylenecyclohex-2-en-1-yl)hept-2-en-4-one Ionophore

Tamer Awad Ali, Gehad G. Mohamed and Amal H. Farag

A new Fe(III) ion-selective screen-printed and carbon paste sensors based on 2-methyl-6-(4-methylenecyclohex-2-en-1-yl)hept-2-en-4-one (MMCHH) has been developed. The electrodes displayed a linear potential response over the wide concentration range from 4.3×10^{-7} to 1×10^{-2} and 1×10^{-7} to 1×10^{-2} mol L-1 with a detection limit of 4.3×10^{-7} and 1×10^{-7} mol L^{-1} for modified carbon paste (MCPEs; electrodes I and II) and screen-printed sensors (MSPEs; electrodes III and IV), respectively. The slopes of the calibration graphs are 18.5 ± 0.9 and 19.3 ± 0.5 for MCPEs with tricresylphosphate (TCP) (sensor I) and o-nitrophenyloctylether (o-NPOE) (sensor II) as plasticizers, respectively. Also, the MSPEs show good potentiometric slopes of 19.1 ± 0.2 and 19.8 ± 0.05 mV decade-1 with TCP (sensor III) and o-NPOE (sensor IV), respectively. The electrodes show stable and reproducible potential over a period of 55, 70, 130 and 150 days for sensors (I), (II), (III) and (IV), respectively. The sensors

possessed some advantages such as short conditioning time, very fast response time (<12, 10, 7 and 5 s for sensors (I), (II), (III) and (IV), respectively) and especially good discriminating ability towards Fe(III) ions over a wide variety of alkali, alkaline earth, transition, and heavy metal ions. The potential response of the proposed sensors was independent of the pH of the test solution within the pH working range from 1.8 to 6.0, 1.5 to 6.0, 1.5 to 6.5 and 1.5 to 6.5 for sensors (I), (II), (III) and (IV), respectively. The optimized sensors were used successfully for direct and indirect determination of free iron species in some different spiked real water samples with satisfactory results. The results compared satisfactory with those obtained with atomic absorption spectrometry.

Keywords: Modified screen-printed sensor; Modified carbon paste sensor; Determination of iron (II); 2-Methyl-6-(4-Methylenecyclohex-2-en-1-yl)hept-2-en-4-one (MMCHH); Water samples.

197. Chemical and Theoretical Studies For Corrosion Inhibition of Magnesium in Hydrochloric Acid by Tween 80 Surfactant

Salah Eid and Walid M. I. Hassan

International Journal of Electrochemical Science, 10: 8017-8027 (2015) IF: 1.5

The aim of this paper is to study the corrosion inhibition of magnesium in hydrochloric acid by using tween 80 surfactant. The inhibition action of tween 80 was studied using hydrogen evolution and weight loss methods. It was found that the addition of tween 80 surfactant inhibits the corrosion rate. The inhibition action was expounded on the basis of adsorption of tween 80 on the magnesium surface forming a hindrance of mass and charge transfer leading to protect the magnesium surface from the aggressive ions. The values of adsorption thermodynamic parameters were calculated and explained. Moreover, theoretical calculation for the energetic parameters and natural bond orbital charges for the tween 80 have been done using hybrid density functional theory B3LYP. The calculations show that non-homogenous branching in tween 80 is more stable compared to homogenous one by about 0.36 eV which can be related to steric hindrances. The theoretical calculations showed that during the physical adsorption, partial electronic charge are transferred from magnesium surface to LUMO orbital which is localized on the ester group.

Keywords: Magnesium; Surfactant; Tween 80; Corrosion inhibitors; Theoretical; DFT.

198. Novel Polymeric Membrane and Coated Wire Electrodes For Determination of Alverine Citrate in Pharmaceutical Formulations and Biological Fluids

M. M. Khalil, Y. M. Issa, S. I. M. Zayed and F. Q. Ali

International Journal of Electrochemical Science, 10: 3442-3457 (2015) IF: 1.5

Selective and sensitive alverine electrodes have been fabricated by constructing a polymeric membrane (PME) and coated wire (CWE) electrodes. These are based on the ion-pair between phosphotungstic acid (PME1, CWE1) and phosphomolybdic acid (PME2, CWE2) in a poly (vinyl chloride) matrix, plasticized with DBP. The influence of membrane composition and pH on the potentiometric responses of electrodes was investigated. The response characteristics of the membrane were compared with polymeric membrane electrode (PME) as well as with coated wire electrode (CWE). The electrodes exhibit Nernstian slope of 59.1 ± 0.4, 59.3 ± 0.6, 59.2 ± 1.1 and 59.5 ± 1.1 mV decade-1 with limits of detection of $7.6\times10-6$, $8.3\times10-6$, $6.6\times10-6$ and $8.1\times10-6$ mol L-1 alverine citrate for PME1, PME2, CWE1 and CWE2, respectively. Furthermore, the electrodes generated constant potentials in the pH range of 1.44-8.05 and 1.42-8.31 for PME1 and PME2, respectively. Selectivity coefficients for alverine citrate relative to numbers of potential interfering substances were investigated. The electrodes were highly selective for alverine over a large number of similar compounds. The proposed electrodes displayed useful analytical characteristics for the determination of alverine citrate in bulk powder, pharmaceutical formulation, and biological fluids (urine and plasma). The practical utility of the proposed electrodes has also been demonstrated by thier usage as indicator electrodes in potentiometric titration of phosphotungstic acid with alverine cation solution.

Keywords: Alverine citrate; Potentiometry; Polymeric membrane electrode; Coated wire electrode; Biological fluids.

199. Determination of Microgram Amounts of Copper in Real Samples Using New Modified Carbon Paste Electrode

Ahmed Fahmy A. Youssef, Yousry M. Issa, Ola R. Shehab and Heba Sherief

International Journal of Electrochemical Science, 10: 4752-4769 (2015) IF: 1.5

A new chemically modified carbon paste electrode (CMCPE) based on copper-Cefazoline, Cu(II)- CFZ, ion-associate has been developed. The electrode exhibits a Nernstian slope of 29.44 mV per decade for Cu(II) ion over a concentration range of $4.01x10-6-7.52x10-3$ mol L-1. The electrode has low limit of detection, $6.28\times10-7$ mol L-1, fast response time of $=10$ s, highly selective, thermally stable and its potential response is pH independent in the pH range 1.6-5.8. This modified electrode was successfully used in determination of copper (II) in different water samples, milk powder, brass powder, soft drink and tea.

Keywords: Carbon paste electrode; Copper (II); Ion-associate; Potentiometry; Cefazoline.

200. Environmentally Safe Protection of Carbon Steel Corrosion in Sulfuric Acid by Thiouracil Compounds

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International Journal of Electrochemical Science, 10: 1595-1615 (2015) IF: 1.5

The inhibitive effect of three thiouracil (TU) compounds on protecting carbon steel corrosion in sulfuric acid was investigated. Experimental results showed that inhibition efficiency of 6-methyl-2-thiouracil (TU-I) is higher than that for 2-thiouracil (TU-II) or 6-phenyl-2-thiouracil (TU-III), i.e. TU-I > TU-II > TU-III. The inhibition efficiency increases with concentration and decreases with temperature. Potentiodynamic curves showed that

tested thiouracils are of mixed type inhibitors. Values of charge transfer resistance (Rct) and double layer capacitance (Cdl) were estimated from impedance data. Thermodynamic functions for the corrosion process were obtained to glean the inhibition mechanism. The adsorption of inhibitors obeys Temkin isotherm. Synergistic effect brought about by the combination of each inhibitor and KI, KBr or KCl was also investigated. The corrosion inhibition process was discussed from the perspective of theoretical properties of the compounds: E_{HOMO}, E_{LUMO}, $\Delta = E_{HOMO} - E_{LUMO}$ and dipole moment (μ), their values confirm the inhibition data.

Keywords: Carbon steel; Corrosion inhibitors; Thiouracils; Weight loss; Polarization; Eis.

201. Potentiometric and Thermodynamic Studies for Binary and Mixed Ligand Complexes of Some Transition Metal Ions with Hydrazone and Phenylalanine

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International J. of Electrochemical Science, 10: 456-471 (2015) IF: 1.5

Binary and ternary complex formation equilibria of M(II) with SAH-hydrazone ligand (2-((2-phthalazin-1-yl)hydrazono) methyl)phenol) in presence of phenylalanine (Phe) as a representative example of amino acids have been studied using the pH-metric titrations. The pH-titrations of the reaction mixtures have been shown 1:1:1 (M: SAH: Phe) ternary complex formation. The stability constants and stoichiometries of the formed binary and ternary complexes have been calculated at I = 0.1mol dm-3 NaCl in 60% (v/v) DMSO-water solution. The stability order of complexes with reference to the metal ions has been followed this order Cu(II) > Ni(II) > Co(II) > Mn(II) in concord with the Irving-Williams stability order. The stability of mixed-ligand complexes was quantitatively matched with the stability of the binary complexes with reference to $\Delta \log_{10}K$, $\Delta \log_{10}\beta$ and $\log_{10}X$ parameters. The speciation of different species in solution has been evaluated as a function of pH. Additionally, the effect of temperature on protonation of ligands and formation of mixed-ligand complexes (M-SAH-Phe) was investigated. The thermodynamics were calculated and discussed.

Keywords: CU(II); Potentiometry; Protonation; Species; Hydrazone; Phenyl alanine; Complex formation.

202. Advances in Direct Formic Acid Fuel Cells: Fabrication of Efficient Ir/Pd Nanocatalysts for Formic Acid Electro - Oxidation

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International Journal of Electrochemical Science, 10: 3282-3290 (2015) IF: 1.5

The modification of a glassy carbon (GC) electrode with palladium (PdNPs) and Iridium (IrNPs) nanoparticles is targeted to develop efficient anodes for formic acid electro-oxidation (FAO). The deposition order of PdNPs and IrNPs is appropriately adjusted in such a way that could improve the electrocatalytic activity and stability of the electrode towards FAO. The highest catalytic activity and stability are obtained at the Ir/Pd/GC electrode (with PdNPs directly deposited onto the GC electrode followed with IrNPs). Such enhancement is manifested in the increase of the oxidation current of formic acid (FA) together with a favorable negative shift in the onset potential of FAO. This marvelous enhancement is believed to originate from the electronic enhancement and/or the bi-functional mechanism of IrNPs to the Pd–based catalysts

Keywords: Electrocatalysis; Fuel cells; Formic aci D electro-oxidation; Stability; Palladium; Iridium.

203. Eco-Friendly Synthesis and 2D-QSAR Study of Novel Pyrazolines as Potential Anticolon Cancer Agents

Thoraya A. Farghaly, Huwaida M. E. Hassaneen and Heba S. A. Elzahabi

Medicinal Chemistry Research, 24: 652-668 (2015) IF: 1.402

New pyrazoline derivatives 7a–f, 11a–f, and 15a–f were synthesized via 1,3-cycloaddition of nitrileimines with a,b-unsaturated ketones using ecofriendly catalysts e.g., iodine or THAC in water. A comparative study between the utility of triethylamine and Na2CO3/THAC as catalyst was achieved. Anticancer activity against colon cancer HT29 was screened for sixteen pyrazoline derivatives. 7a and 11f derivatives were more potent than doxorubicin, while 11d analog was almost equipotent to it. (QSAR) was performed to select out the predominant descriptors affecting the anticancer activity. Lipophilic, topological steric, and electronic dipole descriptors play a decisive role in determining the activity. Three models were generated based on Multiple Linear and Partial Least Square analysis with Leave One Out validation technique.

Keywords: Anti-colon cancer; Regioselective; Pyrazoline; Ecofriendly catalysts; QSAR; Correlation matrix.

204. Synthesis and Cytotoxicity of Fused Thiophene and Pyrazole Derivatives Derived from 2-N-Acetyl-3-Cyano-4,5,6,7-Tetrahydrobenzo[B]Thiophene

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Medicinal Chemistry Research, 24: 2043-2054 (2015) IF: 1.402

The reaction of 2-amino-3-cyano-4,5,6,7-tetrahydrobenzo[b]thiophene with chloroacetyl chloride gave the 2-chloroacetamido derivative 3. The latter reacted with hydrazine hydrate to give the hydrazine derivative 5 which was used to form the hydrazone derivatives 7a, b and 9a, b via its reaction with some carbonyl compounds. Moreover, it produced the pyrazole derivatives 11a, b through its reaction with either acetylacetone or ethyl acetoacetate. On the other hand, compounds 5 and 3 were used to form some thiazole, pyridine, and fused derivatives. The cytotoxicity of the newly obtained products was evaluated against some of the human cancer and normal cell lines where the results showed that compounds 3, 11b, 13, 18c, 18d, 21, 23, and 24 exhibited optimal cytotoxic effect against cancer cell lines, with IC50's in the nM range.

Keywords: Benzo[*b*] thiophene; Pyridine; Pyrazole; Thiazole; Cytotoxicity.

205. Syntheses, Crystal Structures, in Vitro Antitumor and Free Radicalscavenging Activity Evaluation of A Series of 2-Substituted Thiophenes

Yara E. El-Shorafa, Daisy H. Fleita, Ola K. Sakka, William T. A. Harrison, Khaled Mahmoud and Rafat M. Mohareb

A series of thiazole, pyridine and benzylidene derivatives derived from thiophene scaffold have been synthesized. The antitumor evaluation of the newly synthesized products against four cancer cell lines, namely breast carcinoma (MCF-7), liver carcinoma (HepG2), colon carcinoma (HCT-116) and prostate carcinoma (PC3), indicated that the thiazole derivative 11b showed remarkable activity againstall cell lines with LC50 values of 18.3, 2.5, 7.5 and 7.6 lM,respectively. Cytotoxicity toward normal cell lines was also investigated and indicated that compound 21c displayed remarkable potency against PC3 with LC50 values of 7.1 lM and showed weak inhibition of normal cell lines at (GI %) of 41.2 % and thus could be considered as an important lead compound for potential application in anticancer chemotherapy. Brine shrimp lethality assay of the most activecompounds was carried out to detect possible cytotoxicityeffects and indicated that highly active compound, 21c, is not harmful. The X-ray crystallographic analysis of compounds3 and 11b was obtained thus establishing with certainty the proposed structures in this work. The synthesizedcompounds were also screened for their free radical scavenging activity. Hydrazino–thiazole derivatives 15 and 16 showed remarkable antioxidant activity with IC50 values of 60.9 and 61.9 lg ml-1, respectively.
Keywords: Thiophene; Antitumor activity; Free radical scavenging activity; Brine shrimp lethality assay; X-Ray.

206. Synthesis, Cytotoxicity and Toxicity of Thieno[2,3-D]Pyrimidinederived from 2-Amino-3-Cyano-4,5,6,7-Tetrahydrobenzo[B]Thiophene

Mahmoud A. Abdelaziz, Hend M. El-Sehrawi and Rafat M. Mohareb

The 4,5,6,7-tetrahydrobenzo[b]thiophene derivative 1 reacted with benzoylisothiocyanate to give N-benzoylthiourea derivative 3. The latter underwent ready cyclization to give the tetrahydrobenzo[4,5]thieno[2,3- d]pyrimidine derivative 4 which was used as the key starting compound for a series of heterocyclization reactions to produce thiophene, pyridine, pyrimidine and pyran derivatives. The cytotoxicity of the newly synthesized products was evaluated using six cancer and one normal cell lines.The toxicity of compounds with the optimal cytotoxicity was measured using shrimp larvae.
Keywords: Tetrahydrobenzo[B] Thiophene Thieno[2,3-D]Pyrimidine Cyanomethylene Cytotoxicity.

207. Comparison of Electrochemical Behavior of Cu-10Ni-10Zn Alloy and Cu in Aqueous Solutions

Waheed A. Badawy, Mohamed M. El-Rabiei, Hashem M. Nady and Mohammed A. Samy

The electrochemical behavior of Cu-10Ni-10Zn alloy and Cu was investigated in acidic, neutral and basic solutions. The effect of chloride ions in neutral solutions was also studied. Conventional electrochemical techniques and electrochemical impedance spectroscopy were used. The corrosion rate of these materials in acidic solutions is relatively high compared to that in neutral or basic solutions. The open-circuit potential of the alloy is nearly the same as that of pure copper in the different media, indicating that the processes which occur on the alloy surface are mainly governed by copper dissolution. In chloride solutions the rate of Cu corrosion is remarkably high. In the alloy, the copper dissolution was suppressed by the presence of nickel and zinc, due to the formation of complex oxide layers. The impedance data were fitted to equivalent circuit models that explain the different electrochemical processes occurring at the electrode/electrolyte interface. SEM and EDAX have shown that the alloy surface is enriched with Ni. In neutral solutions the chloride ions are penetrating the metallic surface.
Keywords: CU-NI-ZN alloy; Copper; Electrochemical techniques; Sem; Edax.

208. Synthesis, Characterization, and Pharmacological Evaluation of Some Novel Thiadiazoles and Thiazoles Incorporating Pyrazole Moiety as Anticancer Agents

Sobhi M. Gomha, Taher A. Salah and Abdou O. Abdelhamid

Two series of novel 2-[[1-(5-methyl-1-phenyl- 5-substituted-1H-pyrazol-4-yl)ethylidene]hydrazono]-3- phenyl-2,3-dihydro-1,3,4-thiadiazole derivatives and 2-[5- (4-chlorophenyl)-50-methyl-10-phenyl-3,4-dihydro-10H,2H- [3,40-bipyrazol]-2-yl]-4-substituted-5-(phenyldiazenyl)thiazole derivatives were prepared from reaction of hydrazonoyl halides with methyl 2-[1-(5-methyl-1-phenyl- 1H-pyrazol-4-yl)ethylidene]hydrazine-carbodithioate and thiosemicarbazide derivative, respectively. The newly synthesized derivatives were elucidated by elemental analysis, spectral data, and alternative synthetic routes, whenever possible. The anti-cancer activity of the selected products against the breast carcinoma cell line MCF-7 was determined by WST-1 assay indicating concentrationdependent cellular growth inhibitory effect especially for three compounds with dose response curves indicating IC50 values of 21.3 ± 0.72, 21.3 ± 0.72, and 23.56 ± 0.81 lg cm-3, respectively. Confocal laser scanning imaging of the treated cells stained by rhodamin 123 and acridine orange dyes confirms that the selected compounds inhibit the mitochondrial lactate dehydrogenase enzymes. The obtained results revealed promising anticancer activity.
Keywords: 1,3,4,-Thiadiazoles ;Thiazole;Antitumor agents Hydrazonoyl; Halides; Bioorganic chemistry Reaction mechanisms.

209. Biological Activity, Spectral and Thermal Characterization of Mixed Ligand Complexes of Enrofloxacin and Glycine: in Vitro Antibacterial and Antifungal Activity Studies

Madiha H. Soliman, Gehad G. Mohamed and Ahmed M. M. Hindy

The synthesis of novel ternary M(II)/(III)/(IV) complexes with fluoroquinolone drug enrofloxacin (HEFX) and glycine (HGly) containing nitrogen and oxygen donor ligands are prepared and characterized. The prepared complexes have the general formulae of [M(EFX)(Gly) (H$_2$O)$_2$]ClxH$_2$O (M = Cr(III), x = 0 and Fe(III), x = 1), [M(EFX)(Gly)(H$_2$O)$_2$]xH$_2$O (M = Mn(II), x = 0; Co(II), x = 0, Ni(II), x = 1; Cu(II), x = 2; and Zn(II), x = 0), [UO$_2$(EFX)(Gly)]$_3$H$_2$O, and [Th(EFX)(Gly)(H$_2$O)$_2$]Cl$_2$. They are prepared and characterized based on elemental analysis, IR, 1H NMR, magnetic moment, molar conductance and thermal analyses (TG and DTA) techniques. The important bands in the IR spectra and main 1H NMR signals are tentatively assigned and discussed in relation to the predicted molecular structure. The IR data of the HEFX and HGly ligands suggested the existing of a bidentate binding involving carboxylate O and carbonyl for HEFX ligand and amino N and carboxylate O atoms for HGly ligand. The coordination geometries and electronic structures are determined from the diffused reflectance spectra and magnetic moment measurements. The complexes exist in octahedral form. The thermodynamic parameters, such as E*, DH*, DS*, and DG* are calculated from the TG curves using Coats-Redfern method. The HEFX drug, HGly, and the ternary metal complexes are also screened for their in vitro antimicrobial activity against bacterial (Escherichia coli and Staphylococcus aureus) and fungal (Aspergillus flavus and Candida albicans) organisms. The activity data show that HEFX drug and most of the metal complexes have bacterial activity more than the standard. Also the complexes have nearly comparable antifungal activity like that of the parent HEFX drug.

Keywords: Enrofloxacin Glycine Metal Complexes Ir Thermal Analyses Antimicrobial Activity.

210. Supramolecular Structure of Azodye Rhodanine Compounds and Their Complexes: A Review

M. A. Diab, A. Z. El-Sonbati, A. A. El-Bindary and G. G. Mohamed and Sh. M. Morgan

The optical absorption properties of 5-(40-derivatives phenylazo)-2-thioxothiazolidin-4-one (HL$_n$) (where X = H) thin films have been studied. It was found that the values of the energy band gap, Eg, for derivatives were in the range of 1.77–2.29 eV depending on the nature of the substituent. The optical values of the energy band gap (E$_g$) for all derivatives near the absorption edge were found to be direct allowed transition. The synthesized ligands (HL$_n$) (where X = H) were screened as antibacterial and antifungal agents. The proton–ligand dissociation constant of the rhodanine azo derivatives (HL$_n$) (where X = H and X = P-OCH$_3$Ph) and metal–ligand stability constants of their complexes with metal ions (Mn^{2+}, Co^{2+}, Ni^{2+}, Cu^{2+} and Zn^{2+}) have been determined potentiometrically in 0.1 M KCl. The stoichiometries of copper(II) and cadmium(II) complexes of HL$_n$ (where X = Ph) were determined conductometrically and indicated the formation of 1:1 and 1:2 (metal:ligand) complexes. The molar ratio of ligand (HL$_n$) (where X = H) and Ru(III) complexes is (1:2)/(1:3)(M:L$_n$), respectively. The study revealed octahedral geometry around Ru(III) complexes. A series of heterocyclic mixed ligands of oxovanadium(IV) complexes have been synthesized by the reaction of vanadium(IV) sulfate with rhodanine azo (HL$_n$) (where X = H) in the presence of b-diketone

(LH). Palladium(II) complexes of the general formula [Pd(L$_n$)L] (where LH = diketone = acetylacetone, HL$_n$ = azorhodanine) have been synthesized. In these complexes, the azo ligand acts as a monobasic bidentate ligand and is coordinated to the metal ion through the azo-nitrogen, enolic oxygen atoms forming stable six-membered heterocyclic rings. The D.C. electrical conductivity of HLn (where X = Ph) and their complexes were measured. The bond lengths and the force constants have been calculated for uranyl complexes (26–30) of HLn (where X = Ph). The plotting of r1, r2 and r3 (bond distance, rU–O) versus m3 give a straight line with increasing the value of m3 and decreasing rU–O.

Keywords: Rhodanine azo compound ; Supramolecular structure Thin films and optical properties; Biological activity potentiometry Stability constants.

211. Hydrazonoyl Halides in Heterocycles: Synthesis and Anti-Microbial Activity of New 1,2,4-Benzotriazine and Bis-1,2,4- Benzotriazine Derivatives

Asma M. Mahran, Thoraya A. Farghaly and Afaf A. Nada

Starting from o-dianisidine 1 or o-anisidine 7 with ethyl N-araylhydrazono chloroacetate 2a–d, a series of new 1,2,4-benzotriazine 4a–d, 9, and bis- 1,2,4-benzotriazine 6a–d derivatives were prepared. The mechanisms of the studied reactions have been discussed and the anti-microbial activity of the isolated products has been evaluated.

Keywords: O-Dianisidine 1,2,4-Benzotriazine; Bis-1,2,4-Benzotriazine; Hydrazonoyl halides; Biological activity.

212. New 2-Heterocyclic Perimidines: Synthesis and Antimicrobial Activity

Thoraya A. Farghaly, Magda A. Abdallah and Zienab A. Muhammad

A new series of 2-(5-substituted-pyridazine-3,6-dion-4-yl)perimidine derivatives was synthesized in good yields via reaction of (1H-perimidin-2-yl) acetic acid hydrazide with ethyl N-arylhydrazonochloroacetate in dioxane in the presence of triethylamine reagent. The site selectivity of the studied reaction is discussed, and the structure of the products is established based on elemental and spectral data. Also, the antimicrobial activity of the products was evaluated with promising results being obtained.

Keywords: 2-Heterocyclic; Perimidines; Site selectivity; Hydrazonoyl chlorides; Antimicrobial activity.

213 Mixed Ligand Complex Formation of Cetirizine Drug with Bivalent Transition Metal(II) Ions in the Presence of 2-Aminomethylbenzimidazole: Synthesis, Structural, Biological, PH-metric and Thermodynamic Studies

Abeer T. Abdelkarim, Mohammed M. Al-Shomrani, Ahmed M. Rayan and Ahmed A. El-Sherif

Mononuclear copper (II), cobalt (II) and nickel (II) complexes of cetirizine (CTZ=2-[2-[4-[(4-chlorophenyl)phenyl methyl]-piperazine-1-yl]-ethoxy]acetic acid) in the presence of 2-aminomethyl-benzimidazole2HCl (AMBI), as a representative example of heterocyclic bases, were synthesized and studied by different physical techniques. All mixed-ligand complexes have been fully characterized with the help of elemental analyses, molecular weight determinations, molar conductance, magnetic moments and spectroscopic data. The formulae of the isolated complexes are [M(AMBI)(CTZ)(NO$_3$)(H$_2$O)$_2$]nH$_2$O where AMBI is the neutral bidentate 2-aminomethyl benzimidazole, CTZ the deprotonated cetirizine and n = 1 for Co(II) or 0 for Cu(II) and Ni(II) complexes. The measured molar conductance values in DMSO indicate that the complexes are non-electrolytes. The formation equilibria of the ternary complexes have been investigated. Ternary complexes are formed by a simultaneous mechanism. Stoichiometry and stability constants for the complexes formed are reported. The concentration distribution of the complexes in solution was evaluated as a function of pH. The thermodynamic parameters were calculated from the temperature dependence of the equilibrium constants and are discussed. The synthesized metal chelates have been screened for their antimicrobial activities against the selected types of Gram-positive (G$^+$) and Gram-negative (G$^-$) bacteria. They were found to be more active against Gram positive than Gram negative bacteria. The antimicrobial activity in terms of metal ions obeys this order: Cu(II)[Ni(II)[Co(II).

Keywords: Cetirizine; Potentiometry; Benzimidazole; Electronic spectra; Conductance biological activity.

214. Thermodynamics, Chemical Speciation and Complex Formation Equilibria Studies of Binary and Mixed Ligand Complexes of Cu(II) With 2,20-Bipyridyl and Some Aromatic Diamines

Ahmed A. Soliman, Ahmed A. El-Sherif and Mina A. Amin

The formation of mixed ligand complexes of Cu(II) with 2,20-bipyridyl (Bipy) in the presence of some selected aromatic diamines (L) (L = 3,4-diamino benzoic acid (DABA), 2-hydazinopyridine (hzpy) or 4-chloro-o-phenylenediamine has been studied by pH-metric titrations. Potentiometric measurements show that ternary complexes are formed in a simultaneous manner. The pH-titrations of the reaction mixtures are shown to yield 1:1:1 ternary complex formation. The equilibrium and formation constants of the resulting ternary complexes have been calculated at I = 0.1 moldm-3 of NaNO3. The order of stability in terms of the secondary ligands has been found to be DABA[hzpy[CAPA. The stability of ternary complexes was quantitatively compared with their corresponding binary complexes in terms of the parameters Dlog10 K, Dlog10 b and log10 X. The concentration distributions of various species formed in solution were also evaluated as a function of pH. In addition, the effect of temperature on both the ionization process of the ligands and complex formations for Cu–Bipy–L ternary systems was studied. The thermodynamic parameters were calculated from the temperature dependence of the equilibrium constants and are discussed. The structure of the Cu(II) complexes have been geometrically optimized using the parameterized PM3 semiempirical method.

Keywords: Bipyridyl; SpeciationPotentiometry Molecular Modeling.

215. Spectrophotometric Determination of Iron and Copper Ions in Industrial Wastewater, Cooling Water and Scale of Power Station

Hany H. Abdel Ghafar, Gehad G. Mohamed, Magdy Abd El-Salam and Abdel-Aziz Y. El-Sayed

Sensitive and selective spectrophotometric procedures were proposed for the determination of Fe(III) and Cu(II) using simple chromogenic reagents. The procedure of iron determination was based on the formation of ternary complex between Fe(III) and 4,7-diphenyl-1,10-bathophenanthroline (DPBP)–eosin in acid medium. On the other hand, the procedure of copper (II) determination was based on the formation of ternary complex between Cu(II) and 4,7-diphenyl-1,10-bathophenanthroline (DPBP)–Eriochrome Black-T (EBT) in alkaline medium. The ternary complexes were extracted in the presence of cetyltrimethyl ammonium bromide with chloroform. The molar absorptivities of the Fe(III)–DPBP–eosin and Cu(II)–DPBP–EBT ternary complexes were 2.23 · 105 and 9.35 · 104L mol^{-1} cm^{-1} at 542 and 565 nm, respectively. Beer's law is valid over the concentration ranges from 0.280 to 7.814 and from 0.320 to 8.260 µgmL-1 for Fe(III) and Cu(II), respectively. Sandell sensitivity (0.0025 and 0.0679 ng cm-2), relative standard deviation (0.257–1.94 and 0.305–1.85), limits of detection (0.076 and 0.045 µgmL-1) and quantification (0.253 and 0.150 µgmL^{-1}) for Fe(III) and Cu(II) ions, respectively, are calculated. The procedures are applied for the determination of Fe(III) and Cu(II) in different polluted water sources, drinking water, river water as well as cooling water and boiler scales. The results obtained are compared with those obtained using atomic absorption spectroscopy. The effects of different tolerances are studied in the presence of masking agents.

Keywords: Iron and copper determination; Spectrophotometry; Water analysis; Boilers.

216. Microwave- Assisted Synthesis of 2 – Acetyl – 5-Arylthiophenes and 4-(5-Arylthiophen-2-Yl) Thiazoles Via Suzuki Coupling in Water

Kamal M. Dawood, Manahil B. Elamin and Ahmad M. Faraga

2-Acetyl-5-bromothiophene and 4-(5-bromothiophen-2-yl)-2-methyl-1,3-thiazole, as deactivated bromide candidates, were prepared and used for Suzuki cross-coupling reactions with a number of aryl(hetaryl)boronic acids in water or DMF as solvents. The cross-coupling reactions were carried out under thermal heating as well as microwave irradiating conditions using a benzothiazole-based Pd(II)-precatalyst. Optimization of the catalytic reaction condition was also studied.

Keywords: Thiophene; Thiazole; Palladium catalysis; Microwave; Suzuki coupling.

217. Synthesis of Ethynylated Biaryls and Asymmetric Diethynylated Benzene Via Sequential Sonogashira and Suzuki Couplings in Water

Hamdi M. Hassaneen, Kamal M. Dawood, Mohamed S. M. Ahmed, Hyam A. Abdelhadi and Mohamed A.-M. Mohamed

Arkivoc, v: 334-349 (2015) IF: 1.165

Two 1-bromo-4-ethynylbenzene candidates were synthesized from 1-bromo-4-iodobenzene via Sonogashira coupling then sequentially employed in Suzuki coupling with arylboronic acids in water to give ethynylated biaryl derivatives. Optimization of the reaction condition was done using two different palladium sources and various bases/solvents systems. Further sequential Sonogashira coupling of 1-bromo-4-ethynylbenzene candidates, in aqueous medium, afforded asymmetric diethynylated benzene derivatives.
Keywords: Arylacetylenes; Cross-coupling; Catalysis; Palladium; Aqueous medium.

218. Synthesis and Anticancer Activity of Some New Thiopyrano[2,3-D]Thiazoles Incorporating Pyrazole Moiety

Nadia Hanafy Metwally, Mohamed Ahmed Badawy and Doha Samir Okpy

Chemical Pharmacetucial Bulletin, 63 (7): 495-503 (2015) IF: 1.164

The knöevenagel condensation of 3-phenyl-4-thioxo-2-thiazolidinone (1) with 1-phenyl-3-aryl-1Hpyrazole- 4-carbaldehydes 2a–d in refluxing glacial acetic acid or in polyethylene glycol-400 (PEG-400) at room temperature without catalyst, afforded the corresponding 5-hetarylmethylene derivatives 3a–d. [4+2] Cycloaddition reaction of compounds 3 with N-arylmaleimides, acrylonitrile and ethyl acrylate afforded thiopyrano[2,3-d]thiazole derivatives 5a–p. The anticancer activity of some of the newly synthesized compounds was investigated against different human cancer cell lines (MCF7 and HEPG2) and confirmed by molecular docking. Moreover, the structure for one representative example of the new products was confirmed by X-ray crystallography. The structure of all the newly synthesized compounds was established by elemental and spectral data.
Keywords: 4-Thioxo-2-thiazolidinone; Thiopyrano[2,3-D]Thiazole; Anticancer activity.

219. Cellulose Sulfuric Acid as an Eco-Friendly Catalyst for Novel Synthesis of Pyrido[2,3-D][1,2,4]Triazolo[4,3-a]Pyrimidin-5-Ones

Sobhi M. Gomhaa and Sayed M. Riyadh

J. Braz. Chem. Soc., 26: 916-923 (2015) IF: 1.129

A novel synthesis of a series of pyrido[2,3-d][1,2,4]triazolo[4,3-a]pyrimidin-5-ones has beendeveloped from reactions of 1-(5-methyl-1-phenyl-1H-pyrazol-4-yl)-3-arylprop-2-en-1-ones and7-amino-1,3-disubstituted[1,2,4]triazolo[4,3-a]pyrimidin-5(1H)-ones in dioxane under thermalconditions, using cellulose sulfuric acid as an eco-friendly acid catalyst. The reaction mechanismwas

proposed and the structures of the newly synthesized compounds were established on thebasis of spectral data (mass spectrometry, infrared, 1H and 13C nuclear magnetic resonance) andelemental analyses.
Keywords: Cellulose sulfuric acid; Chalcone; Annelated heterocyclic ring system.

220. Modified Screen-Printed Ion Selective Electrodes for Potentiometric Determination of Sodium Dodecylsulfate in Different Samples

Tamer Awad Ali and Gehad G. Mohamed

Journal of Aoac International, 98(1): 116-123 (2015) IF: 1.12

Fabrication and general performance characteristics of novel screen-printed sensors for potentiometric determination of sodium dodecylsulfate (SDS) are described. The sensors are based on the use of ionassociation complexes of SDS with cetylpyridinium chloride (electrode I) and cetyltrimethylammonium bromide (electrode II) as exchange sites in a screen-printed electrode matrix. Electrodes (I) and (II) show fast, stable, and near-Nernstian response for the mono-charge anion of SDS over the concentration range of $1 \times 10^{-2} – 5.8 \times 10^{-7}$ and $1 \times 10^{-2} – 6.3 \times 10^{-7}$ mol/L at 25°C and the pH range of 2.0–9.0 and 2.0–8.0 with anionic slope of 57.32 ± 0.81 and 56.58 ± 0.65 mV/decade, respectively. Electrodes (I) and (II) have lower LODs of 5.8×10^{-7} and 6.3×10^{-7} mol/L and response times of about 8 and 13 s, respectively. Shelf life of 5 months for both electrodes is adequate. Selectivity coefficients of SDS related to a number of interfering cations, and some inorganic compounds were investigated. There were negligible interferences caused by most of the investigated species. The direct determination of 0.10–13.50 mg of SDS by electrodes (I) and (II) shows average recoveries of 99.96 and 99.85%, and mean RSDs of 0.83 and 1.04%, respectively. In the present investigation, both electrodes were used successfully as end point indicators for determination of SDS in pure pharmaceutical preparations and real spiked water samples. The results obtained using the proposed sensors to determine SDS in solution compared favorably with those obtained by the standard addition method.
Keywords: Screen-printed Sensors; Potentiometric; Sodium dodecylsulfate; Water samples.

221. Corrosion Inhibition by Naturally Occurring Hibiscus Sabdariffa Plant Extract on A Mild Steel Alloy in HCL Solution

Magda Abdo Mahmoud and Amany Mohamed Fekry

urkish Journal of Chemistry, 39: 1078-1088 (2015) IF: 1.117

The corrosion inhibition of mild steel alloys is of tremendous technological importance due to their increased industrial applications. Potentiodynamic polarization and electrochemical impedance spectroscopy techniques were used to establish the effect of different concentrations of HCl on the corrosion behavior of mild steel. A study was conducted on the inhibition of dissolution for a mild steel alloy in the most corrosive concentration of HCl (5 M) by adding different concentrations of aqueous extract of Hibiscus sabdariffa plant (named karkade or rosselle) as an ecofriendly inhibitor. The extent of corrosion inhibition as measured by the two techniques was comparable.

The results indicated that the additive acts by way of adsorption as an effective protective inhibitor in aggressive acid medium. Curves representing the variation in the extent of adsorption or surface coverage as a function of the concentration of the additive are invariably sigmoid in nature. Generally the inhibition efficiency increases with increasing additive concentration

Keywords: Mild steel; Corrosion; HCL; Inhibitor; Hibiscus sabdariffa.

222. Synthesis and Biological Evaluation of Novel Fused Triazolo[4,3-A] Pyrimidinones

Ikhlass Abbas, Sobhi Gomha, Mohamed Elneairy, Mahmoud Elaasser and Bazada Mabrouk

The reaction of thione 3 or its 2-methylthio derivative 4 with hydrazonoyl halides 5a{l, in the presence of triethylamine, yielded the corresponding triazolo[4,3-a]pyrimidin-5(1H)-ones 8a{l. The structure of compounds 8a{l was further con rmed by the reaction of 3 with the appropriate active chloromethylenes 11a{c followed by coupling of the products with benzenediazonium chloride to a ord the azo- coupling products 6b, f, and j, which were converted in situ to 8b, f, and j. 2-Hydrazinyl-pyrido[3',2':4,5]thieno[3,2-d]pyrimidin-4(3H)-one (13) was prepared and condensed with di erent aldehydes 14a-f to give the corresponding hydrazone derivatives 15a{f. Oxidative cyclization of the hydrazones 15a{f give the corresponding triazolo[4,3-a] pyrimidin-5(1H)-one derivatives 16a-f.The antimicrobial activity of the products was evaluated and the results revealed that compounds 8f and 15f showed strong activity against gram-positive bacteria while compound 15d showed the highest activity against gram negative bacteria. Moreover, compounds 15b, 8d, 8e, 8c, 8l, and 8j exhibited signi cant antifungal activity. In addition, the antitumoral activity of the synthesized products against di erent cancer cell lines was determined and the results revealed that compound 12c was the most active against MCF-7, HepG-2, HCT-116, and HeLa with IC50 values of 0.51, 0.72, 0.95, and 0.95, respectively, as compared with doxorubicin as positive control.

Keywords: Triazolopyrimidinones; Cyclizations; Hydrazonyl chlorides; Antimicrobial; Anticancer activity.

223. Synthesis and Biological Evaluation of New Pyridines Containing Imidazole Moiety as Antimicrobial and Anticancer Agents

Ikhlass Abbas, Sobhi Gomha, Mahmoud Elaasser and Mohammed Bauomi

The synthesis of a novel series of pyridine and bipyridine derivatives is described via one-pot multicomponent reaction of 5-acetylimidazole, malonitrile (or ethylcyanoacetate or diethylmalonate), substituted benzaldehyde (or terephthaldehyde), and ammonium acetate in good yields. The structures of all the new compounds were elucidated on the basis of elemental analysis and spectral data. The antimicrobial activities of the synthesized compounds were screened and the results showed that most of such compounds exhibit considerable activities.

Furthermore, some of the newly synthesized compounds were screened for their anticancer activity against human breast cell line (MCF-7) and liver carcinoma cell line (HEPG2) in comparison to doxorubicin. Most of the tested compounds exhibited promising activity.

Keywords: 5-Acetylimidazole; Cyanopyridone; Bipyridine; Multicomponent reactions; Anticancer activity.

224. Synthesis of Novel 1,2,4-Triazoles and Triazolo-Thiadiazines as Anticancer Agents

Thoraya Abd El-Reheem Farghaly, Magda Ahmad Abdallah and Huda Kamel Mahmoud

A new series of 7-arylazo-5H-3-(tri uoromethyl)-6-methyl-1,2,4-triazolo-[3,4- b]-1,3,4-thiadiazines was pre- pared by reaction of 4-amino-3-tri uoromethyl-5-mercapto-1,2,4-triazoles with N -aryl-2-oxo-propane hydrazonoyl chlo- ride in dioxane under re ux in the presence of triethylamine. Furthermore, Schiff bases of 4-amino-5-mercapto-1,2,4- triazole derivatives were reacted with a variety of hydrazonoyl chlorides and gave the respective hydrazonothioates. In addition, the novel bis-(1,2,4-triazole-3-thione) was reacted with the appropriate hydrazonoyl chloride in dioxane under re ux in the presence of triethylamine to give the corresponding bis-(1,2,4-triazolethiohydrazonoate). The structures of the new compounds were established based on elemental and spectral data. The mechanism of the studied reaction was also discussed. Moreover, some of the new products were screened for their anticancer activity and the results obtained are promising and indicate that compounds 4a and 4i are the most active inhibitors against HEPG-2 and compounds 4a and 13b are active against HCT cell lines.

Keywords: 4-Amino-3-Tri Uoromethyl-5-Mercapto-1,2,4-triazole; Hydrazonoyl Halides; Anticancer activity; Triazolo[3,4-B][1,3,4]thiadiazines.

225. Synthesis, Characterization and Quantum-Chemical Calculations of Novel Series of Pyridones, Quinazolinones and Pyrazoles Heterocyclic Compounds

M. A. Salem, M. H. Hela, Taha M. A. Eldebss,T. A. Abd‑elaziz A. A. El‑Sherif and G. A. M. Mohamed

This paper presents a combined synthesis and computational study of novel series of pyridones, quinazolinones and pyrazoles heterocyclic compounds. The compounds have been characterized by elemental analyses and spectral like IR, 1H NMR, 13C NMR and MS studies. Michael addition of substituted-2-methoxycarbonylacetanilide 2a,b on the a-substituted cinnamonitriles 3a-d gave the corresponding pyridone and quinazolinone derivatives 5, 6a-c, 7a-d, and 14a-e, respectively. Reaction of ethyl-2-cyano3-ethoxyacrylate with 2a,b to produce the corresponding pyridone 10a, b. Also, spiro pyridine derivative 12 was synthesized through the reaction of 2a,b with indandione malononitrile. Reaction of hydrazine and phenyl hydrazine with acrylamido derivatives 15a-d in refluxing ethanol afforded the novel pyrazoles 16 and 17. The molecular modeling of the

synthesized compounds has been drawn and their molecular parameters were calculated. Also, valuable information is obtained from the calculation of molecular parameters including electronegativity of the coordination sites, net dipole moment of the compounds, total energy, electronic energy, binding energy, HOMO and LUMO energy.
Keywords: Pyridones; Quinazolinones; Pyrazoles; Molecular modeling; Michael addition.

226. A Comparative Study of Solid and Liquid Inner Contact Paroxetine Hydrochloride Ion-Selective Electrode Membranes

Mohamed Magdy Khalil, Yousry Mostfa Issa and Ali Gaber Mohamed

Journal of the Iranian Chemical Society, 12: 1637-1648 (2015) IF: 1.087

A comparative study was made between two designs of paroxetine-selective electrodes: a polyvinyl chloride membrane (liquid inner contact) called electrodes PME1 and PME2 and a solid contact called electrodes CWE1 and CWE2 based on paroxetine–phosphotungstate and paroxetine–phosphomolybdate as ion exchangers. The four electrodes, PME1, PME2, CWE1 and CWE2, show linearity over the concentration range from $1 \times 10\text{-}5$ to $1 \times 10\text{-}2$ M, with slopes of 56.7, 54.4, 59.8 and 55.3 mV/decade, meanwhile the limits of detection were $2.5 \times 10\text{-}6$, $4 \times 10\text{-}6$, $5.6 \times 10\text{-}6$ and $6.2 \times 10\text{-}6$ M, respectively. PME1 and PME2 showed better limit of detection than electrodes CWE1 and CWE2. The present electrodes show clear discrimination of Prx.HCl from several inorganic, and organic species. The sensors were applied efficiently for determination of Prx.HCl in its pharmaceutical preparations using standard addition and the calibration curve methods.
Keywords: Ion-selective electrodes; Solid-contact ion-selective electrode; PVC membrane electrode; Paroxetine hydrochloride.

227. Transformation of Benzoxazinone Derivatives to Some Interesting Heterocyclic Compounds With Expected Biological Activity

Magda I. Marzouk, Thoraya A. Farghaly, Maher A. El-Hashash, Soheir A. Shaker and Shadia M. Hussein

Heterocycles, 91: 1399-1416 (2015) IF: 1.079

The newly synthesized iodobenzoxazinone derivative was reacted with benzoyl hydrazide, sodium azide, hydrazine hydrate, p-toluidine, hydroxylamine hydrochloride and formamide to give (quinazolinyl)benzamide, (oxazinyl)benzohydrazide, imidazolecarboxamide, (tetrazolyl)benzoic acid, 3-aminoquinazolinone, p-toylquinazolinone, hydroxyquinazolinone and quinazolinone derivatives respectively. Reaction of hydroxyquinazolinone with acetic anhydride and ethyl chloroacetate afforded (quinazolinyl)acetate and ethyl (quinazolinyloxy)acetate derivatives. The quinazolinone reacted with benzoyl chloride, acetyl chloride and ethyl chloroacetate to afford N-(3-benzoyldihydroquinazolinyl)- N-phenylbenzamide, 3-acetylquinazolinone and ethyl quinazolinylacetate respectively. The acetohydrazide which was synthesized from the reaction of the ethyl quinazolinyl acetate with hydrazine hydrate was used as a starting material for preparation of some other quinazolinone

derivatives. The newly synthesized compounds were characterized by spectroscopic tools and some of them were screened for antibacterial and antifungal activity.
Keywords: Iodobenzoxazinones; Quinazolinone; Antibacterial; Antifungal activity.

228. Synthesis and Antitumor Activity of 1,3,4-Thiadiazole Derivatives Bearing Coumarine Ring

Sobhi M. Gomha and Hassan M. Abdel-aziz

Heterocycles, 91: 583-592 (2015) IF: 1.079

In the present study, preparation of a novel series of N'-(3,5-diphenyl-1,3,4-thiadiazol-2(3H)-ylidene)-2-oxo-2H-chromene-3-carbohydrazide (8a-m) was prepared by two methods via the reaction of hydrazonoyl halides with methyl 2-(2- oxo-2H-chromene-3-carbonyl)hydrazinecarbodithioate or 3-(5-mercapto-1,3,4-oxadiazol-2-yl)-2H-chromen-2-one. Structures of the newly synthesized compounds were elucidated on the basis of elemental analyses and spectral data.All the newly synthesized compounds have been evaluated for their antitumor activity against a liver carcinoma cell line HEPG2-1. Also, their structure activity relationship (SAR) was studied. Many of the tested compounds showed moderate to high anticancer activity with respective to doxorubicin as a reference drug.
Keywords: 3-(5-Mercapto-1,3,4-Oxadiazol-2-Yl)-2H-Chromen-2-One; Hydrazonoyl halides; Anticancer activity.

229. Synthesis and Anti-Hypertensive A-Blocking Activity Evaluation of Thiazole Derivatives Bearing Pyrazole Moiety

Sobhi Gommha, Khaled Khalil, Hassan Abdel-aziz and Mohamed Abdalla

Heterocycles, 91: 1763-1773 (2015) IF: 1.079

A novel, facile reaction for the synthesis of series of thiazole derivatives has been developed from the reaction of the appropriate thiosemicarbazone derivatives and 2-bromo-1-(5-methyl-1-phenyl-1H-pyrazol-4-yl)ethanone in ethanol under reflux. The structures of the newly synthesized products were established on the basis of spectral data (Mass, IR, ^{1}H and ^{13}C NMR) and elemental analyses. The pharmacological screening showed that many of the synthesized compounds exhibit a good antihypertensive a-blocking activity and having low toxicity, as compared to Minoxidil.
Keywords: Thiosemicarbazones; Thiazole; Acetylpyrazole; Anti-hypertensive A-blocking agents.

230. Synthesis and Anticancer Activities of Thiazoles, 1,3-Thiazines, and Thiazolidine Using Chitosan-Grafted-Poly(Vinylpyridine) as Basic Catalyst

Sobhy M. Gomaa, Sayed M. Riyadh, Elmahdi A.Mahmmoud and Mahmoud M . Elaasser

Heterocycles, 91: 1227-1243 (2015) IF: 1.079

Three different series of ethylidenehydrazonothiazoles5a-c, 6a-c, ethylidenehydrazono-1,3-thiazines 9a-i and

ethylidenehydrazonothiazolidine12 have been prepared via reactions of ethylidenethiosemicarbazide3a orethylidenethiocarbohydrazide3b with *a*-halocarbonyl compounds 4a-c, acrylonitrile derivatives 7a-i, and dimethyl acetylenedicarboxylate10, respectively. Different basic catalysts were used in these reactions such as, triethylamine, chitosan, and chitosan-grafted-poly(vinylpyridine) and the latter catalyst has precedence as environmentally friendly basic catalyst. Also, Molecular mechanics calculations were achieved to measure the stability of the isolated products as syn- or anti-form. Moreover, the selected newly synthesized products were evaluated for their anti-cancer activity against a colon carcinoma cell line (HCT-116) and liver carcinoma cell line HEPG2-1 and revealed promising activity especially 1,3-thiazines 9c-i.

Keywords: Thiazoles; 1,3-Thiazines; Thiazolidine; Grafted-chitosan; Mm2 calculations; Anticancer activity.

231. Synthesis and Antimicrobial Evaluation of Some Novel Thiazole, 1,3,4-Thiadiazole and Pyrido[2,3-D][1,2,4]- Triazolo[4,3-A]Pyrimidine Derivatives Incorporating Pyrazole Moiety

Abdou O. Abdelhamid, Ahmad S. Shawali, Sobhi M. Gomha and Waleed A.M. A. El-Enany

New series of novel functionalized thiazoles, 1,3,4-thiadiazoles and pyrido[2,3-d][1,2,4]triazolo[4,3-a]pyrimidines containing pyrazole moiety were synthesized using 4-acetylpyrazole as a precursor. The structures of the compounds prepared were confirmed by both spectral and elemental analyses and by alternative synthetic routes. The mechanisms of the studied reactions were also discussed. Sixteen compounds were evaluated for their in vitro antimicrobial activity. The results proclaimed that some of the tested compounds exhibited moderate to significant antibacterial and antifungal activities. Compounds 11e, 11a, and 11d exhibited high antibacterial activity against Bacillus subtilis compared with reference drug (Ampicillin) while compounds 11a, 6g, 18e, 18a,11d, 6a, 11c, 11b and 6d exhibited higher antifungal activity against Syncephalastrum racemosum than reference drug (Amphotericin B).

Keywords: Thiazoles; 1,3,4-thiadiazoles; Antimicrobial activity.

232. Spectrophotometric Determination of Distigmine Bromide, Cyclopentolate HCL, Diaveridine HCL and Tetrahydrozoline HCL Via Charge Transfer Complex Formation With TCNQ and TCNE Reagents

Gehad Genidy Mohamed, Mahmoud Sabry Rizk and Eman Yousry Zaky Frag

The purpose of this investigation was directed to propose sensitive, accurate and reproducible methods of analysis that can be applied to determine distigmine bromide (DTB), cyclopentolate hydrochloride (CPHC), diaveridine hydrochloride (DVHC) and tetrahydrozoline hydrochloride (THHC) drugs in pure form and pharmaceutical preparations via charge-transfer complex formation with 7,7,8,8-tetracyanoquinodimethane (TCNQ) and tetracyanoethylene (TCNE) reagents. Spectrophotometric method involve the addition a known excess of TCNQ or TCNE reagents to DTB, CPHC, DVHC and THHC drugs in acetonitrile, followed by the measurement of the absorbance of the CT complexes at the selected wavelength. The reaction stoichiometry is found to be 1:1 [drug]: [TCNQ or TCNE]. The absorbance is found to increase linearly with concentration of the drugs under investigation which is corroborated by the correlation coefficients of 0.9954-0.9981. The system obeys Beer's law for 6-400, 20-500, 1-180 and 60-560 µg mL-1 and 80-600, 10-300, 1-60 and 80-640 µg mL-1 for DTB, CPHC, DVHC and THHC drugs using TCNQ and TCNE reagents, respectively. The apparent molar absorptivity, sandell sensitivity, the limits of detection and quantification are also reported for the spectrophotometric method. Intra- and inter-day precision and accuracy of the method were evaluated as per ICH guidelines. The method was successfully applied to the assay of DTB, CPHC, DVHC and THHC drugs in formulations and the results were compared with those of a reference method by applying Student's t and F-tests. No interference was observed from common pharmaceutical excipients.

Keywords: Spectrophotometry; Charge transfer; DDQ; Distigmine bromide; Cyclopentolate hydrochloride; Diaveridine hydrochloride; Tetrahydrozoline hydrochloride.

233. Regiochemistry and Substituent Effects on Pyrylogen and Thiopyrylogen Stability and Electronic Character

Edward L. Clennan, Will Welch, Tamer T. El-Idreesy and Navamoney Arulsamy

A physical organic analysis of a collection of 57 data sets generated by B3LYP/6-311+G(2d,p) geometry optimizations and TD-DFT calculations is presented. The analysis engenders recommendations for syntheses of new pyrylogen electron-transfer sensitizers that are potentially optimized for low energy absorbance and high extinction coefficients. It is argued that bathochromically shifted intense absorbance is especially useful to avoid competitive absorbance by electron-transfer substrates and for use at the low concentrations likely achievable in experimentally attractive nonpolar solvents.

Keywords: Pyrylium cations; Pyridinium cations; Pyrylogens; Sensitizers; Electron transfer.

234. Synthesis of Some New 5-Substituted-3-Phenyl-4-Thioxo-2- Thiazolidinones and their Fused Thiopyrano[2,3- d]Thiazole Derivatives

Mohamed Ahmed Badawya, Nadia Hanafy Metwallya and Doha Samir Okpya

The new 5-arylmethylene-3-phenyl-4-thioxo2-thiazolidinone derivatives have been synthesized by condensation of ω -(4-formylphenoxy)acetophenone derivatives with 3-phenyl-4-thioxo-2-thiazolidinone, in good yields. The cycloaddition of the newly synthesized compounds to N-arylmaleimides, ethyl acrylate and ω-nitrostyrene has been studied. Under thermal reaction

conditions [4+2]cycloaddition proceeds with complete site- and regioselectivity to yield the new fused thiopyrano[2,3d]thiazole derivatives.

Keywords: ω -(4-formylphenoxy) acetophenones; 3-phenyl-4-thioxo-2-Thiazolidinone; [4 + 2] Cycload-dition reaction; 5-[(4-benzoylmethoxy) Phenylmethylene]-3-phenyl-4-thioxo-2-thiazolidinones; Thiopyrano[2,3- D]-thiazoles.

235. Synthesis and Antifungal Activity of Novel Quinazolin-4(3H)-One Derivative

Maher A. El-Hashash, Manal M. Elshahawi, Eman A. Ragab and Sanaa Nagdy

A novel group of 6-iodoquinazolin-4(3H)-one derivatives was prepared starting from 6-iodo-2-ethoxy-4H-3,1-benzoxazin-4-one (3) via action of various nitrogen nucleophiles such as primary and secondary amines, hydrazine hydrate, and its derivatives. The 3-amino-2-hydrazinyl-6-iodoquinazolin-4(3H)-one (15) was used as a key starting material to prepare new heterocyclic compounds. The structures of all synthesized compounds were inferred from the infrared, mass spectral, and 1H NMR spectral data as well as elemental analysis. The fungicidal activities of the target compounds were preliminarily evaluated.

Keywords: Antifungal activity; Benzoxazinone; Quinazolinones.

236. Convenient Synthesis of Polyaza-3,4- Bis (Heteroaryl) Pyrazoles

Ahmad S. Shawali and Adel J. M. Habouba

Reactions of a new series of bis-enaminones with some N- and C-nucleophiles proved to be convenient routes for syntheses of a variety of novel 3,4-bis(heteroaryl) pyrazoles. The structures of the compounds were elucidated on the basis of their spectral and elemental analyses and by alternative synthesis wherever possible.

Keywords: Enaminones; Heterocycles; Hydrazonoyl halides; Pyrazoles.

237. Molybdenum Metallurgy Review: Hydrometallurgical Routes to Recovery of Molybdenum from Ores and Mineral Raw Materials

T. A. Lasheen, M. E. El-Ahmady, H. B. Hassib and A. S. Helal

With the vigorously growing demand of the steel industry, oil and gas industry, corrosion resistance alloys, cast iron, and catalyst industries, high-grade molybdenum ores are being exhausted gradually in the world. Thus, much attention have been drawn to the recovery of molybdenum from low-grade molybdenum ores in recent years. With the increasingly stringent environmental requirements, the shortcomings due to SO2 emission in the roasting process of traditional technology becomes obvious. This review outlines metallurgical processes for molybdenum production from various resources, particularly focusing on recent developments in direct hydrometallurgical and recovery processes to identify potential sources of molybdenum products and by-products such as uranium which can be economically produced. Several methods have been extensively reviewed for molybdenum separation and purification from solution which are potentially applicable to leach solutions of molybdenum ores and raw materials. The main methods include solvent extraction, ion exchange, membrane-based separation, and precipitation. Solvent extraction is highly selective for recovery of molybdenum and the most promising method recommended for future research and development. Membrane-based separation is the next preferred method for selective extraction of molybdenum, purification of molybdenum solutions, or co-recovery of other valuable metals. Ion exchange offers useful means for purification and/or co-recovery of other base metal impurities, although the scale of application of ion exchange in the industry is limited.

Keywords: Ion exchange; Membrane-based separation; Molybdenum metallurgy; Recovery of molybdenum; Solvent extraction.

238. Antimicrobial and Anticancer Evaluation of A Novel Synthetic Tetracyclic System Obtained by Dimroth Rearrangement

Sobhi M. Gomha, Ikhlass M. Abbas, Mohamed A. A. Elneairy, Mahmoud M. Elaasser and Bazada K. A. Mabrouk

A series of pyrido[3',2':4,5]thieno[2,3-e][1,2,4]triazolo[4,3-c]pyrimidines were prepared via oxidative cyclization of 4-(2-arylidenehydrazinyl) pyrido[3',2':4,5]thieno[3,2-d]pyrimidines. Dimroth rearrangement of such a series yielded pyrido[3',2':4,5]thieno[2,3-e][1,2,4]triazolo[1,5-c]pyrimidines. A reaction mechanism was proposed and the products were screened for their antimicrobial and anticancer activities. From the antimicrobial screening results, it could be seen that compounds 8c, 9f and 10c showed excellent activity against Gram-positive bacteria while compounds 10d and 8c showed the highest activity against Gram-negative bacteria. The results of the anticancer activities showed that compound 9c was the most active against HepG-2 and MCF-7 with IC50 values of 1.19 and 3.46 µg/mL, respectively

Keywords: Hydrazones; Oxidative cyclizations; Thienopyridines; Reaction mechanism.

239. Towards Understanding Mode of Action of L-DOPA and Carbidopa: DFT/TD-DFT Analyses of Their Electronic and Vibration Spectra

Ghader M. Sukkera, Nuha Wazzanb and Rifaat Hilal

The electronic absorption and vibrational spectra of L-dopa (LD) and carbidopa (CD) have been measured experimentally in different solvents and also computed theoretically. FTIR spectra of LD and CD have been computed theoretical at the B3LYP/6-311++G** level of theory. A scaling factor of 0.95 results in good correspondence between calculated and experimental spectra. Vibrational modes have been assigned and similarities and

differences between the FTIR spectra of LD and CD are discussed. Two IR marker bands have been identified for CD. Based on TD-DFT/TPSSh calculations, the leading transitions contributing to the electronic absorption of LD and CD are proposed. These findings have been discussed in the context of the experimentally observed spectra reported for LD and CD in different solvents. NTO analyses clearly indicate that most of the leading transitions in LD and partially in CD involve a sizable charge transfer from the aromatic catechol moiety to the aliphatic amino acid side chain. The short wavelength transition, however, shows an opposite trend.

Keywords: Theoretical chemistry; Density functional calculations; Electronic spectra; Vibration spectra; L-dopa; Carbidopa.

240. Ultrafast Radiationless Decay Mechanisms Through Conical Intersections in Cytosine: Computational Insight and Topological Analysis of the Charge Density Distributions

Rifaat Hilal, Saadullah G Aziz, Abdulrahman O Alyoubi and Shaaban A Elroby

he quantum theory of atoms-in-molecules (QTAIM) in conjunction with the DFT/B3LYP/6-311++G(2d,2p) wave function are used to compute the atomic, bonded and non-bonded interactions, distributions of the charge density, rho(r), and its Laplacian, del(2)rho(r), for the ground equilibrium structure of cytosine. The study has been further extended to include two conical intersection (CI) structures that underlie the radiationless decay of cytosine. Complete Active Space Multi-configuration SCF level of theory with the 6-311++G** basis set are used to identify, characterize and to optimize the geometrical structures of the conical intersections between S-0 and S-1. In the case of cytosine, all ring bond critical points show del(2)rho(r) < 0 indicating covalent binding and accumulation of the electron density in the bonding regions. On the other hand, the C-1-O-11 bond shows, depletion of charge density, indicating the increased ionic character of this bond. This point might very well underlie the reactivity and the low keto-enol bather in cytosine. Contour plots and relief maps have been analyzed for regions of valence shell charge concentrations and depletions in the ground state and the three CI structures of cytosine. NBO analysis reveals that the conformational and overall stability of the studied cytosine conformations is facilitated by the competitive conjugative and the lone-pair interactions. In cytosine, there is a delicate balance between these two forces, whereas, in each of the two CI configurations there is one dominant force that underlies the stability of the cytosine structure. The present work indicates that the QTAIM provide not only a graphical presentation of very important critical points on the PBS but also unique quantitative descriptors of CI's that characterize it.

Keywords: Theoretical chemistry; Density functional calculations; Quantum theory of atoms-in-molecules; Conical intersections; Ultrafast radiationless decay; Electron density; Cytosine.

241. Investigation on the Properties of Rubber Composites Containing Modified Clay

Salwa H. El-Sabbagh and Doaa S. Mahmoud

Purpose: The purpose of this paper is to evaluate the efficiency of organobentonite (OB) as reinforcing filler in acrylonitrile-butadiene rubber (NBR). The composites were prepared using different loadings of OB and studying in details their properties. A series of OB was modified using surfactant N-cetyl-N, N, N-trimethyl ammonium bromide (CTAB) with concentrations 0.5, 1 and 2 cation exchange capacity (CEC) of bentonite. Design/methodology/approach – The different bentonites were characterized using different analytical and spectro-photometric techniques, such as infra red, X-ray diffraction, thermogravimetric analysis and scanning electron microscopy, while rubber vulcanizate rheological, morphological, swelling and thermal properties were examined using different standard instrumental testing and methods.

Findings: The study revealed that the modification of bentonite using CTAB showed significant enhancement on NBR properties, and the optimum filler loading was 12 phr for both 0.5CEC OB and 2CEC OB. These modified bentonites improved reinforcing properties to NBR vulcanizates. Also, results showed that composites exhibited remarkable improvements in tensile strength, elongation at break and hardness in the presence of modified bentonite and also an increase in thermal stability.

Research limitations/implications: Na-B cannot be applied in rubber matrix without modification because it is incompatible with it.

Practical implications: The modified bentonite is considered as efficient reinforcing filler which can replace other fillers because it has lower surface energy and improved intercalating behaviour in rubber matrix.

Originality/value: These papered bentonites are cheap with relatively high purity, which make rubber/clay composites emerge as new class of material and can be used in different fields other than rubber.

Keywords: Composites; Chemical analysis and testing; Mechanical properties; Ftir spectroscopy; Thermal analysis; curing; Fillers; Rubber; Natural resources; Hardness measurement.

242. Synthesis and in Vitro Antitumor Evaluation of Some New Pyrimido[4,5-b]Quinoxaline 5,10-Dioxide Derivatives

Mohamed Waly, Sameh Elgogary, Ahmed Lashien and Ahmad Faragc

A new series of tricyclic pyrimidoquinoxaline derivatives were synthesized and evaluated as antitumor assays and compared with standard drug 5-fluorouracil. These new pyrimidoquinoxaline derivatives were synthesized by the reaction with o-aminonitrilequinoxaline derivative 3 with various reagents. One from which, the condensation of o-aminonitrile with potassium cyanate in acetic acid was stated as a new procedure for building the pyrimidine ring incorporate to quinoxaline moiety. Further condensation of aminonitrile 3 with formamide or Vilsmeier

reaction followed by transamination or carbon disulphide was applied as procedures for the pyrimidine ring syntheses. Compound 15 achieved significant in vitro antitumor activity, and compounds 9 and 14 have high activities.

Keywords: Quinoxaline; Pyrimidine; Pyrimidoquinoxaline; Antitumor activity.

243. Synthesis and Tautomeric Structure of Tris(Arylazo) Derivatives of Novel 1H-Bis-Imidazo[1,2-b:2',1'-e]Pyrazole Ring System

Ahmad Sami Shawali, Thoraya A. Farghaly, Mohamed R. Shehata and Shadia M. Husseina

J. Heterocyclic Chem., 52: 545-550 (2015) IF: 0.787

An efficient and convenient synthesis of tris(arylazo) derivatives of novel heterocyclic ring system, namely, 1H-bis-imidazo[1,2-b:2',1'-e]pyrazole, is described. The structures of the compounds prepared and their tautomeric structure were elucidated on the basis of their elemental analyses and spectral data in addition to correlation of their acidity constants by Hammett equation. The mechanism of the studied reactions and their site selectivity are discussed.

Keywords: Hammett equation; Site selectivity.

244. Synthesis and Anti-Cancer Activity of 1,3,4-Thiadiazole and 1,3-Thiazole Derivatives Having 1,3,4-Oxadiazole Moiety

Kamal M. Dawood and Sobhi M. Gomha

J. Heterocyclic Chem., 52: 1400-1405 (2015) IF: 0.787

Reaction of 1,3,4-oxadiazolyl-phenylthiourea 3 with hydrazonoyl halides gave the corresponding 1,3,4- oxadiazolylimino-1,3,4-thiadiazoles. Also, treatment of 3 with ethyl chloroacetate and a-haloketones afforded the corresponding thiazolidinone and thiazole derivatives, respectively. The structures of the synthesized products were confirmed by spectral data. Ten compounds were evaluated for their anti-cancer activity against the colon carcinoma cell line (HCT-116). The results revealed that 1,3,4-thiadiazole derivatives 13d and 19c (IC50=0.73 and 0.86 µg/mL, respectively) have promising antitumor activity against colon carcinoma (HCT-116), and most of the tested compounds showed moderate anti-cancer activity.

Keywords: 1,3,4-Oxadiazoles; 1,3,4-Thiadiazoles; Hydrazonoyl halides; Thiazoles; Anticancer activity.

245. Site- and Regioselectivity of the Reaction of Hydrazonoyl Chlorides With Perimidine Ketene Aminal. Antimicrobial Evaluation of the Products

Thoraya A. Farghaly and Huda K. Mahmoud

Journal of Heterocyclic Chemistry, 52: 86-91 (2015) IF: 0.787

Reaction of hydrazonoyl chlorides with perimidine ketene aminal derivative in dioxane in the presence of triethylamine afforded either pyrrolo[1,2-a]perimidines or pyrazolyl perimidines depending on the type of hydrazonoyl chloride used. The reaction was found to be site- and regioselective according to the

suggested mechanism. The structure of the newly synthesized compounds was established on the basis of spectral data and elemental analyses.

In addition, the antimicrobial activity of the newly synthesized compounds was evaluated, and the results showed moderate activity of all compounds against the bacterial species.

Keywords: Hydrazonoyl halides; Ketenaminal; Site-and regioselectivity, Antimicrobial activity.

246. A Simple, Convenient, One-pot Synthesis of Dihydro-Azolopyrimidines, DFT Calculation, and NMR Determination by Using H-Ferrierite Zeolite as Catalyst

H. M. E. Hassaneen and T. A. Farghaly

J. Heterocycl. Chem., 52: 1154-1161 (2015) IF: 0.787

The multicomponent reaction of acetophenone derivatives with heterocyclic amines and benzaldehyde derivatives in water in the presence of H-ferrierite zeolite for short time 8–15 min afforded new series of [1,2,4]triazolo[1,5-a]pyrimidines and pyrimido[1,2-a]benzimidazole derivatives. The structure of the actual tutomeric product was established on the bases of spectral data [IR, NMR (1H and 13C), and nuclear Overhauser effect] and density functional theory calculations.

Keywords: Dihydro-azolopyrimidines, DFT calculation; H-ferrierite zeolite; Heterocyclic amines.

247. Synthesis and Antimicrobial Activity of Some Novel Substituted Bis-pyridone, Pyrazole, and Thiazole Derivatives

Nadia H. Metwally, Fathy M. Abdelrazek and Mohammed T. Jaafar

J. Heterocyclic Chem., 52: 358-365 (2015) IF: 0.787

A variety of novel bis-heterocyclic derivatives were synthesized via the reaction of bis-cyanoacetanilide derivative 3 with various aromatic aldehydes (1:2 molar ratio), to give the corresponding bis-arylidene derivatives 5a–m. On the other hand, reacting compound 3 with substituted 2-hydroxybenzaldehydes 6a–c afforded 2-iminochromene-3-carboxamides 7a–c.

The reaction of compound 5 with malononitrile afforded the novel bis-pyridones 9a–c,f–h. The reaction of 5 with hydrazine derivatives afforded pyrazoles 11a–f, respectively. Compound 3 reacts with phenyl isothiocyanate in the presence of potassium hydroxide at room temperature followed by addition of some different halo-carbonyl compounds to afford bis-poly-functionalized thiazole derivatives 13a–c. The bis-enamine derivative 15 reacts also with hydrazine hydrate, guanidine, and hydroxylamine to give bis-pyrazole 17, pyrimidine 19, and isoxazole 21 derivatives, respectively. Some of the newly synthesized compounds show moderate to high antimicrobial activity.

Keywords: N,N0- (1,4-Phenylene) Bis (2- Cyanoacetamide); Phenylene-1,4-diamine.

248. Bis (A-Bromo Ketones): Versatile Precursors for Novel Bis (S-Triazolo [3, 4-B][1, 3, 4] Thiadiazines) and Bis (Thiazoles)

Ahmed R. S. Ginidi, Mohamed R. Shaaban, Ahmad M. Farag, and Ahmed H. M. Elwahy

Journal of Heterocyclic Chemistry, 52: 1421-1428 (2015) IF: 0.787

A synthesis of novel bis(s-triazolo[3,4-b][1,3,4]thiadiazines) 4, 5, 6 in which the triazolothiadiazine is linked to the benzene core through the thiadiazine ring via phenoxymethyl spacers was reported. First attempt to synthesize 4, 5, 6 by the reaction of the appropriate bis(acetophenones) with 4-amino-3-mercapto-1,2,4-triazole derivatives using an acidified acetic acid method were unsuccessful. On the other hand, reaction of the corresponding bis(a-bromoketones) with 4-amino-3-mercapto-1,2,4-triazole derivatives afforded 4, 5, 6 in good yields. The reaction pathway is assumed to involve S-alkylation to give bis(aminotriazole) intermediates, followed by intramolecular cyclocondensation to give 4, 5, 6. The successful isolation of the corresponding bis(aminotriazole) intermediates provides strong evidence for the proposed mechanism. The novel bis(thiazoles) 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, linked to alkyl or aryl spacers can also be synthesized by reaction of the appropriate bis(bromoacetyl) compounds 12a, 12b, 12c and 14, 15, 16, 17, 18, 19 with the corresponding thioamide derivatives 20, 21, 22.
Keywords: Cyclocondensation; Cyclization; Condensation; Bis (S-Triazolo[3,4-B][1,3,4] Thiadiazines).

249. A Novel Synthesis of Some 1,4-Phenylene-Bis-Heterocyclic Derivatives and of Some Pyran, Pyrano[2,3-C]Pyrazole, and Pyrano[2,3-D] Pyrimidine Derivatives

F. M. Abdelrazek, M. H. Helal, A. S. Hebishy and S. M. Hassan

Journal Heterocyclic Chemistry, 52: 1026-1031 (2015) IF: 0.787

p-Diacetyl benzene 1 undergoes bromination to afford p-bromoacetyl phenacyl bromide 2. Compound 2 reacts with twofold excess of malononitrile to afford 2-{2-[4-(3,3-Dicyanopropionyl)-phenyl]-2-oxo-ethyl}-malononitrile 3. Compound 3 could be cyclized to afford the 1,4-phenylene-bis-furan derivative 4. Compound 3 reacts also with a twofold excess of hydrazine hydrate and phenyl hydrazine under dry conditions at room temperature to afford the bis pyrazole derivatives 5a,b respectively. The reaction of 5a,b with the same reagents in refluxing dioxane afforded the bis pyrazolopyridazine derivatives 7a and 7b respectively. The azo coupling of compound 3 with arene diazonium salts afforded the bis pyrazole derivatives 9a-c. The *β*-keto esters 10a,b react with benzaldehyde and malononitrile in a one pot synthesis to afford the pyran derivatives 11a,b. These latter compounds react with hydrazine hydrate and urea derivatives to afford the pyrano[2,3-c]pyrazoles 15a,b and the pyrano[2,3-d]pyrimidine derivatives 17a,b respectively.
Keywords: 1,4-Diacetyl benzene; 4-Bromoacetyl phenacyl bromide; 1,4-Phenylene-bis-heterocyclic Derivatives; Pyrano[2,3-C] pyrazoles; Pyrano[2,3-D] Pyrimidines.

250. Synthesis of Some Novel Cyclooctane-fused-Heterocycles with Anticipated Biological Activities

E. Nassar, A. F. El-Farargy and F. M. Abdelrazek

Journal Heterocyclic Chemistry, 52: 1395-1399 (2015) IF: 0.787

Claisen-Schmidt condensation of furan-2-carboxaldehyde 1 with cyclooctanone 2 afforded smoothly the bis chalcone: 2,8-bis((furan-2-yl)methylene)cyclooctanone 3. Compound 3 was allowed to react with different organic reagents through 1,2 and 1,4 cycloaddition reactions to afford the cyclooctane-fused heterocyclic compounds 4-14 and 17a-c in good yields. The structures of all the new compounds were elucidated and deduced from their elemental analyses as well as the spectral data.
Keywords: Cyclooctanone; Pyrazoles; Pyrimidines; Pyrans.

251. Synthesis of Some Novel Heterocyclic Xylidinyl Amines and Carboxamides

Fathy M. Abdelrazek, Mohamed S. Farghaly and Hussein E. Abdelrahman

Journal Heterocyclic Chemistry, 52: 163-168 (2015) IF: 0.787

The xylidines 1a,b undergo condensation with ethyl cyanoacetate 2 and ethyl benzoyl acetate 15 to afford the cyano acetanilides 3a,b and the b-diketones 16a,b, respectively. Compounds 3a,b react with hydrazine and phenyl hydrazine to afford the azine-bis derivatives 5a,b and 7a,b, whereas 16a,b react with the same reagents to afford the pyrazolyl amine derivatives 17a,b and 18a,b, respectively. Compounds 3a,b react also with dimethylformamide dimethylacetal to afford the enaminonitriles 8a,b, whereas 16a,b react with the same reagent to afford only the enaminone 19b. The enaminonitriles 8a,b react with hydrazine and phenylhydrazine to afford also the azine-bis derivatives 11a,b and 14a,b, respectively.
Keywords: Xylidines, β-cyano ester; β-keto ester; Azine-bis derivatives, Enamine derivatives,

252. Synthesis and Antitumor Screening of Some New 2,6-Bispyridines Functionalized With Pyrazole-Based Heterocycles

Korany A. Ali, Mohamed A. Elsayed, Salwa M. Elhallouty, Khaled Mahmoud and Ahmad M. Farag

Acta Poloniae Pharmaceutica - Drug Research, 72: 1193-1200 (2015) IF: 0.737

Several new pyrazole, 1,3,4-oxadiazole, 1,2,4-triazole, 1,3,4-thiadiazole and thiazol-2-ylidene derivatives attached to pyridine ring at 2,6-positions have been synthesized starting from the versatile 3,3'-(pyridine-2,6-diyl) bis(1H-pyrazole-4-carbohydrazide). The newly synthesized compounds were evaluated for their in vitro anticancer activity against HEPG2, A549 and MCF-7 human cancer cell lines. The results showed that the newly synthesized compounds displayed low to moderate activity against the tested human cancer cell lines.
Keywords: Pyridine; Thiazole; Bis-pyrazole; 1,2,4-triazole; 1,3,4- Thiadiazole; Anticancer screening.

253. Toward Understanding Tautomeric Switching in Hydroxynaphthaldehydes: Characterization of Electronic Absorption Spectra

Aeshah El-Amry, Shaaban A. Elroby Oliver K€uhn and Rifaat H. Hilal

Experimental long wavelength electronic absorption spectra of 4-hydroxy-1- naphthaldehyde, its dimer complexes, and 4-hydroxy-3-(piperidine-1-ylmethyl)-1- naphthaldehyde are assigned using TDDFT with the TPSSh functional. With decreasing wavelength the spectrum is dominated by the deprotonated (360–400 nm), the dimer (340– 370 nm), and the monomer (< 280 nm) species. Using hydroxynaphthaldehydes for the design of tautomeric switches is discussed.

Keywords: Hydroxynaphthaldehyde; Density functional theory; Electronic absorption; Dimer complexes.

254. Toward Understanding Tautomeric Switching in 4-Hydroxynaphthaldehyde and its Dimers: A DFT and Quantum Topology Study

Aeshah El-Amri, Shaaban A. Elroby, Oliver K€uhn andRifaat H. Hilal

The electronic structures and stabilities of all benzenoid (enol) and quinonoid (keto) forms of 4-hydroxynaphthaldehyde (ALD-14) have been investigated using density functional theory (DFT) with a range of functionals and basis sets. The anti-enol form represents the global minimum energy structure. Low rotation barriers of both the hydroxyl and the aldehyde groups characterize this form. Fourier analysis of the potential energy function for rotation indicate that the conformational preference of ALD-14 is determined by both the dipole–dipole repulsion and bond moments interactions. Further, three different ALD-14 dimer complexes are investigated, i.e. head-to-tail (HT), head-to-head (HH), and stacked (S) forms. The analysis of natural bond order, quantum topology features of the Laplacian of the electron density, binding energies and structural parameters of these dimers point to comparable stabilities of the HT and S-dimers, with a preference for a stacking contact. The origin of its stability can be traced to p-conjugative, H-bonding and dispersion interaction.

Keywords: Hydroxynaphthaldehyde; DFT calculation; QTAIM-NBO analysis; Dimer complexes.

255. Synthesis of New Functionalised Derivatives of [1,2,4]Triazolo[4,3-A]Pyrimidine and Pyrimido[2,1-B][1,3,5]Thiadiazine as Aromatase Inhibitors

Sobhi M. Gomha, Fathy M. Abdelrazek and Mohamed M. Abdulla

New functionalised 3,4-dihydropyrimido[2,1-b][1,3,5]thiadiazine-6,8-(2H,7H)-dione and [1,2,4]triazolo[4,3-a]pyrimidine-5,7-(1H,6H)-dione derivatives were synthesised through the reaction of thiobarbituric acid with aromatic amines and formaldehyde and from thiobarbituric acid and hydrazonoyl halides, respectively. The structures of the target compounds were confirmed by 1H NMR, IR and MS spectra. Moreover, the newly synthesised products were tested for their aromatase inhibition activities and the results obtained were promising compared with the drug letrozole, a non-steroidal aromatase inhibitor.

Keywords: Thiobarbaturic acid; Pyrimido-thiadiazines; Triazolo-pyrimidines; Mannich reaction; Hydrazonoyl halides.

256. Synthesis and Characterisation of Some Novel Fused Thiazolo[3,2-A] Pyrimidinones and Pyrimido [2,1-B][1,3] Thiazinones

Ikhlass M. Abbas, Sobhi M. Gomha, Mahmoud M. Elaasser and Bazada K. A. Mabrouk

Reactions of 7,9-bis(4-methoxyphenyl)-2-thioxo-2,3-dihydropyrido[3',2':4,5]thieno[3,2-d]pyrimidin-4(1H)-one with a-haloketones, chloroacetonitrile and DMAD, afforded the corresponding fused thiazolo[3,2-a]pyrimidinone derivatives. The reaction of the thione with chloroacetic acid and an appropriate aromatic aldehyde yielded the respective 2-arylidene-2H-pyrido[3',2':4,5]thieno[3,2-d]thiazolo[3,2-a]pyrimidine-3,5-diones. Also, the treatment of thione with arylidenemalononitriles gave the fused pyrimido[2,1-b][1,3]thiazine derivatives,respectively. The structures of the synthesised products were confirmed by IR, 1H NMR and mass spectral techniques. The cytotoxic activity of the new products against breast carcinoma (MCF-7) and hepatocellular carcinoma (HepG2) cell lines were determined and the results revealed promising activity.

Keywords: Thiazolo [3,2-A] pyrimidinones; Pyrimido[2,1-B] [1,3] Thiazinones; Thiones, Cytotoxic activity.

257. Synthesis and Anticancer Activity of Arylazothiazoles and 1,3,4-Thiadiazoles Using Chitosan-Grafted-Poly(4-Vinylpyridine) as A Novel Copolymer Basic Catalyst

Sobhi M. Gomha, Sayed M. Riyadh, Elmahdi A. Mahmmoud, and Mahmoud M. Elaasser

A novel series of 4-substituted 5-arylazo-2-[1-(pyrrol-3-yl)ethylidenehydrazinyl]thiazoles and 5-arylazo-2-[1-(pyrrol-3-yl)ethylidenehydrazinyl]-2,3-dihydrothiazol-3-amines was prepared by cyclocondensation of a-oxohydrazonoyl halides with 1-(pyrrol-3-yl)-ethylidenethiosemicarbazide and 1-(pyrrol-3-yl)ethylidenethiocarbohydrazide, respectively. These cyclocondensation reactions were achieved by using chitosan-grafted-poly(4-vinylpyridine) as a novel basic catalyst under microwave irradiation. Furthermore, the reaction of the above mentioned thiosemicarbazide and thiocarbohydrazide with N-phenylbenzenecarbohydrazonyl chlorides (bereft of the a-oxo group) using chitosan-grafted catalyst proceeded via a similar mechanism and afforded the same 2-hydrazono-1,3,4-

thiadiazoles.The structures of the newly synthesized compounds were established on the basis of spectroscopic evidences as well as by their synthesis via alternative methods. Finally, the appraisal of the newly synthesized products for their anticancer activity against a colon carcinoma cell line (HCT-116) and liver carcinoma cell line (HEPG2-1) revealed promising activity, especially 4-phenyl- and 4-(thiophen-2-yl)- substituted 1,3-thiazole derivatives.
Keywords: Arylazothiazole; 1,3,4-Thiadiazole; Anticancer activity; Cyclocondensation.

258. Development of Two Reference Materials for All Trans-Retinol, Retinyl Palmitate, α-and γ-Tocopherol in Milk Powder and Infant Formula

Adel B. Shehata, Mahmoud S. Rizk, Ahmad M. Farag and Ibrahim F. Tahoun

Journal of Food and Drug Analysis, 23: 82-92 (2015) IF: 0.615

Vitamins are important food constituents that can be present in almost every foodstuff. Food quality and safety depends on food surveillance by reliable quantitative analysis enabled by appropriate quality control. Certified matrix reference materials are versatile tools to support quality assurance and control. However, in the case of vitamins, which are important in various foods, there is a lack of matrix reference materials. Two certified reference materials for the determination of alletrans-retinol, retinyl palmitate, and a- and g-tocopherol in milk powder and infant formula have been developed by the National Institute of Standards, Egypt. This article presents the preparation, characterization, homogeneity, and stability testing as well as statistical treatment of data and certified value assignment. The assignment of the certified values and associated uncertainties in the prepared natural-matrix reference materials were based on the widely used approach of combining data from independent and reliable analytical methods.
Keywords: Certification; Infant formula; Milk powder; Reference materials; Statistical analysis; Vitamins.

259. A Theoretical Study of the Thermal Curtius Rearrangement of Some Cinnamoyl Azides Using the DFT Approach

Rafie H. Abu-Eittah, Walid M. I. Hassan and W. Zordok

Journal of Structural Chemistry, 151: 628-641 (2015) IF: 0.508

The thermal Curtius rearrangement of cinnamoyl azide, 1-azido-3-phenylprop-2-ene-1-one, and the reactions of some of its derivatives is studied theoretically using the DFT-B3LYP/6-31G(d,p) approach. The potential energy surface profiles of the rearrangement are calculated. The transition state was located and confirmed. The Curtius rearrangement of the studied compounds is a one-stage, discrete reaction. A weak effect of substitution on the reaction rate is due to the unique, localized p system of the studied molecules; strong opposing dipoles span the whole molecule.
Keywords: Curtius rearrangement; Cinnamoyl azides; DFT treatment; One stage mechanism.

260. Substituent Effects on the Absorption and Vibrational Spectra of Some 2-Hydroxy Schiff Bases: DFT/TDDFT, Natural Bond Orbital and Experimental Study

S. A. Elroby, S. Aboud, S. G. Aziz and R. Hilal
Journal of Structural Chemistry, 56: 414-427 (2015)
IF: 0.508

The electronic structure of salicylideneaniline (SA) and some of its derivatives are investigated both experimentally and theoretically. The equilibrium geometric structures of the studied compounds are determined at the B3LYP/6-311++G** level of theory. A set of 12 substituted SA derivatives is considered in the present work.
The choice of these substituents aims to create a push-pull system on the SA basic structure which would shade light onto its photo physics. The electronic absorption spectra of SA are recorded in the UV-VIS region, in both polar and nonpolar solvents. Assignments of the observed electronic transitions are facilitated via time-dependent density functional theory (TDDFT) computations at the same level of theory. Electronic configurations contributing to each excited state are identified and the relevant MOs are characterized.
The extent of delocalization and intramolecular charge transfer are estimated and discussed in terms of natural bond orbitals (NBO) analysis and second order perturbation interactions between donor and acceptor MOs. Solvent effects on the electronic absorption spectra are discussed in terms of the difference in polarizabilities of the ground and excited states. FTIR spectra of SA and its derivatives are measured in KBr platelets.
Detailed vibrational assignments are given based on the calculated potential energy distributions. "IR marker bands" that characterize the SA framework are identified. The effect of substituents, the nature of the characteristic "marker bands", and intensity quenching of some bands are discussed.
Keywords: Electronic spectra; Vibrational spectra; DFT/TDDFT; Solvent and substituent effects; NBO analysis; 2-Hydroxy schiff bases.

261. Design and Synthesis of Novel Fused Heterocycles Using 4-Chromanone as Synthon

K. A. Ali, N. A. A. Abdelhafez, E. A. Ragab, A. A. Ibrahim and A. E. Amr

Russian Journal of General Chemistry, 85(12): 2853-2860 (2015) IF: 0.477

A new series of heterocyclic systems, including azole, azolopyrimidine, and pyridopyrimidine derivatives, attached to 2H-chromene scaffold, was prepared by a convenient procedure through the reactions of (E)-2-dimethylamino-methylene chromanone with different nitrogen binucleophiles. Various substituted chromeno[4,3-b]pyridine derivatives were also prepared through the reactions of (E)-2-dimethylaminomethylene chromanone with a series of active methylene compounds.
Keywords: 4-Chromanone; Pyrazole; Pyrimidine; Pyridine.

262. 2,4-Cycloaddition Reactions: Preparation and Cytotoxicity of Novel Quinoline and Pyrrolo [3,4-F] Quinoline Derivatives

Ahmed S. I. Mohamede, Mohamed A. A. Elneairy and Sanaa M Eldine

Int. J. of Pharmacy and Pharmaceutical Sciences, 7: 64-68 (2015)

Objective: the present work aimed to synthesize novel quinoline and pyrroloquinoline derivatives and study their cytotoxic activity.

Methods: Diels–Alder reaction (4+2) was used for the synthesis of new quinolone and pyrrolo quinoline derivatives via the reactions of compound 1 with N-maleimide (4a-d) derivatives, ethyl acrylate (6) methylmethacrylate (8) and acetylene dicarboxylic acid (10). The synthesized compounds were characterized by NMR and Mass spectral data. Some of the synthesized compounds were screened for their antitumor activity against three different cell lines (MCF-7, HepG2 and HCT).

Results: The tested compounds exhibited antiproliferative activity against the three different cell lines, especially against MCF-7.

Conclusion: New quinoline and pyrroloquinoline derivatives were synthesized starting with 6-methyl-4-phenyl-2-thioxo-5-(4-methylphenylthio)-1,2-dihydropyridine-3-carbonitrile. Two new compounds 3 and 5a were tested for their in vitro antiproliferative activity against MCF-7, HepG2 and HCT cancer cell lines. The result showed that compound 3 exhibited more potent antiproliferative activity than compound 5a in case of MCF-7 and HCT cell lines.

Keywords: Quinolones; Pyrroloquinolines; Cycloaddition; Anti-tumor cytotoxicity.

263. Novel Fused Thienopyridne and Pyrazolopyridine Derivatives: Synthesis, Characterization and Cytotoxicity

Mohamed A. A. Elneairy, Sanaa M. Eldine and Ahmed S. I. Mohamed

Der Pharma Chemica, 7: 284-295 (2015)

Several new of fused thienopyridine and pyrazolopyridine derivatives were synthesized via the reactions of both compounds 2- Carbohydrazide 2 and 3-aminopyrazolopyridine 14 with a variety of active reagents and chemicals. Structures were established based on elemental and spectral data studies. Some of the synthesized compounds exploited potent antitumor activity, especially the pyridopyrazolotriazine 20c which displayed the highest activity among the tested compounds with the IC50 equal to 3.8μg/ml.

Keywords: Pyridothienopyrimidinone; Pyridothienotriazines; Pyridopyrazolotriazines; Pyridopyrazolopyrimidine; Anti-tumor cytotoxicity.

264. Synthesis, Characterization, and Microbial Activity of Nanocomposites of Chitosan-Graft-Poly(4-Vinyl Pyridine) Copolymer/Organophilic Montmorillonite

Hala F. Naguib, Mohamed S. Aziz Abdel and Gamal R. Saad

Polymer-Plastics Technology and Engineering, 54: 1270-1279 (2015)

Organophilic montmorillonite was synthesized by cationic exchange between Na+-MMT and N-octyl-N-vinyl-2-pyrrolidonium bromide. Nanocomposites of chitosan grafted with 4-vinyl pyridine and organophilic montmorillonite were prepared in acetic acid using ammonium persulfate as initiator. The molecular structure of the grafted copolymer was confirmed by FTIR. The degree of dispersion and the intercalation spacing of these nanocomposites were investigated using X-ray diffraction. The enhanced thermal stability of nanocomposites was verified by differential scanning calorimetry and thermogravimetric analysis. Preliminary results of the antibacterial and antifungal activities of the prepared nanocomposites have demonstrated significant antimicrobial activity of the nanocomposites compared with pure and grafted chitosan.

Keywords: Antimicrobial properties; Chitosan; Graft copolymer; Nanocomposites; Thermal stability.

265. Multicomponent Reactions of Acetoacetanilide Derivatives with Aromatic

Rasha Abdallah Azzam and Rafat Milad Mohareb

Chem. Pharm. Bull., 63: 1055-1064 (2015)

The multi-component reaction of either acetoacetanilide derivative 1a or b with any of the aldehyde derivatives 2a–d and malononitrile 3 in the presence of triethylamine as a catalyst gave the 4H-pyran derivatives 4a–g, respectively. Carrying the same reaction but using a catalytic amount of ammonium acetate gave the 1,4-dihydropyridine derivatives 5a–f, respectively. The use of ethyl cyanoacetate instead of malononitrile in the presence of a catalytic amount of triethylamine gave the 4H-pyran derivatives 7a–d, respectively. Compound 4e was used to synthesize 1,4-dihydropyridine 9a–c and arylhydraone 11a–e derivatives were synthesized from 4a and e. The anti-tumor evaluations of the newly synthesized products were tested against six human cancer and normal cell lines. The results showed that compounds 4a, b, f, 5d, f, 9 and 11a–d had optimal cytotoxic effect against cancer cell lines with IC50<550 nM. The toxicity of the most active compounds was further measured against shrimp larvae.

Keywords: 4H-Pyran; 1,4-dihydropyridine; Cyanomethylene; Cytotoxicity.

266. Synthesis and Cytotoxic Evaluation of Pyran, Dihydropyridine and Thiophene Derivatives of 3-Acetylcoumarin

Rafat Milad Mohareb and Nadia Youssef Megally Abdo

Chem. Pharm. Bull., 63: 678-687 (2015)

A series of coumarin analogues bearing 4H-pyran rings 2a–d, 11a–d and 1,4-dihydropyridine rings 3a–d, 12a–d at position 3 were synthesized starting from either 3-acetyl coumarin (1) or the coumarin acetohydrazide derivative 4. Condensation of 3-acetylcoumarin (1) with 2-cyanoacetohydrazide afforded 2-cyano-N'-{1-[2-oxo-2H-chromen-3-yl]ethylidene}acetohydrazide (4). Reaction of compound 4 with elemental sulfur and either malononitrile or ethyl cyanoacetate afforded the thiophene derivatives 8 and 9, respectively. The structures of the newly synthesized compounds were confirmed on the basis of their spectral data and elemental analyses. All synthesized compounds were screened for their in vitro anticancer activity against six

human cancer cell lines and normal fibroblasts. Several compounds showed potent inhibition with an IC_{50} value of <870 nM. Compound 3d exhibited equivalent cytotoxic effect as the standard CHS 828 against a breast cancer cell line (IC50 value=18 nM). Normal fibroblast cells (WI38) were affected to a much lesser extent (IC50 value >10000 nM).

Keywords: Coumarin; 4H-pyran; Dihydropyridine; Thiophene; 2-Cyanoacetohydrazide; Anticancer activity.

267. Poly(Amide-Hydrazide)S–Graphene Composites Synthesis and Characterization

Maher Z. Elsabee, Mohamed Nassar, Rania E. Morsi and Said S. Elkholy

Polymer Composites, 1: 1-8 (2015)

Poly(amide-hydrazide)s copolymers were prepared using hydrazide derivative of phenylene diamine to react with aromatic diacid chloride. The wholly aromatic poly(amide-hydrazide)s have better solubility in organic polar solvents, such as N,N-dimethylacetamide, dimethylsulfoxide, 1-methyl-2-pyrollidone, and N,N-dimethylformamide, at room temperature, while still maintaining their high thermal stability. Graphene in the nano size was used as a filler to enhance their thermal and mechanical properties. The polymers as well as the composite were characterized by spectral and mechanical tools as well as by X-ray analysis.

Keywords: Polyamide-hydrazide; Graphene composites; Thermal properties.

268. Spectrophotometric Study of the Reaction Between Tryptophan and Ferroin at Different Forms

M.A. Zayed and M.M. Taha

Egyptian Journal of Chemistry, 58 (3): 237-258 (2015)

The Indicator ferroin III had been prepared by titration of Ferroin II against permanganate in sulfuric acid medium till blue color appeared of λ_{max} = 590 nm. The effect of time on the stability of blue ferroin (III) at λ_{max} = 590 nm was studied and it was found to completely change into red ferroin (II) of λ_{max} = 515 nm within 3 hr. Therefore, in this study the redox reaction between tryptophan (Trp) and ferroin indicator in its oxidized form (ferroin III) had been carefully studied; aiming to use both forms of this indicator in spectrophotometric micro-determination of Trp in pure form and in embryo synthetic and actual media. It had been found that; at λ_{max} = 590 nm the reaction between Trp and ferroin III involved oxidation of Trp into Trp- and the indicator spontaneously reduced to ferroin II. Tracing the reaction between two forms of ferroin indicator after adding variable [Trp] = 10-3 M under proper selected conditions leads to the construction of two linear calibration curves, descending at λ_{max}= 590 nm and ascending at λ_{max} = 515 nm. This means that the reaction at λ_{max} = 590 nm is a redox reaction and at λ_{max} = 515 nm may be ion-pair formation [Trp]-[ferroin] ++. The concentration ranges of the two calibration graph are found to be 2.05997-12.3594 and 41.058-164.2 µg mL-1, respectively and the linearity was satisfactory (r= 0.9991and r = 0.999, respectively). The methods are successfully applied to a synthetic mixture containing some components of the human embryos' culture medium without interference and the results are satisfactory. This encouraged us to

apply these procedures to the actual culture medium which yield a percent recovery of Trp in this medium of 99.51-101.5 and 100.2-100.3 % at λ =515 and 590 nm,respectively and with SD = 0.003464-0.01963 and RSD = 0.1640- 0.3679 and Sandell sensitivity of S (µg cm-2) = 7.424x10-7. These values refer to the accuracy and precision of the applied spectrophotometric procedures in embryo media analyses. The importance of this research work stems from; it is the first time to find cheap, simple and rapid pectrophotometric methods for Trp analyses that present in synthetic and actual embryo medium constituents. These methods can be used as alternative for expensive sophisticated tools such as HPLC, HNMR and mass famously used in literature.

Keywords: Ferroin indicator; Redox reaction; Ion-pair formation; Microdetermination of trp and analyses of embryo culture medium.

269. Spectrophotometric Micro-Determination of Three Quinolones Antibacterial Drugs in Pure and in Pharmaceutical Dosage Forms by Reactions With Diphenylamine Sulphonate Redox Indicator

M.A. Zayed and Raghda M. Belal

Egyptian Journal of Chemistry, 58 (3): 333-347 (2015)

Areliable, sensitive and efficient new spectrophotometric methods for the determination of three quinolones, namely Ciprofloxacin (CIP), Norfloxacin (NOR) and Nalidixic acid (NA) have been performed either in pure or in pharmaceutical dosage form. The methods are based on the reaction of the studied drugs with diphenyl amine sulphonate (DPAS) indicator in its oxidized form obtained by indicator titration with potassium dichromate in sulfuric acid medium. Two products form in two concentration ranges of each drug and two mechanisms of reactions are involved.The first reaction mechanism; drugs reduce DPAS oxidant (violet form) and their concentrations are micro-determined at λ_{max} = 545 - 550 nm for NA, CIP and NOR, respectively. The second mechanism; their concentrations are micro-determined via ion pair which is formed after 30 min (brown form) at λ max = 245, 280, and 285 nm for NA, CIP and NOR, respectively. The results are validated statistically by % recovery, SD and RSD values. The robustness and ruggedness of the methods are checked by inter and intra-days tests. The proposed methods are in good agreement with those given by the official methods as confirmed by F- and t- tests.

Keywords: Quinolones; Ciprofloxacin; Norfloxacin; Nalidixic acid; Diphenyl amine sulphonate (DPAS) and spectrophotometric methods.

270. Spectrophotometric Determination of Gemifloxacin Mesylate, Moxifloxacin. HCL and Gatifloxacin Sesquihydrate in Pure and in Pharmaceutical Preparations

M.A. Zayed and Heba A. Dakhly

Egyptian Journal of Chemistry, 58 (3): 349-364 (2015)

SIMPLE, rapid and sensitive spectrophotometric method was developed for the determination of gemifloxacin mesylate (GMF), moxifloxacin.HCl (MXF) and gatifloxacin sesquihydrate (GAF) in pure and pharmaceutical preparation. This method is based on

ion pair formation reaction between GMF, MXF and GAF and rosebengal indicator in universal buffer of pH 5.The formed ion pair is measured at λ_{max} = 575 nm. All optimum conditions are established. The calibration graphs are rectilinear at concentration ranges 9.71 – 53.40, 8.758 – 52.55 and 8.048– 48.29 µg ml-1 for GMF, MXF and GAF, respectively.

The sandell sensitivity (S) = 0.0263 , 0.0244 and 0.0263 $\mu g \, cm_{-2}$, molar absorptivity = 1.861x 104, 1.835x 104 and 1.561x 104 L $mol_{-1} \, cm_{-1}$, correlation coefficient 0.9998 and LOD = 01.90, 1.607 and 1.876 µg ml_{-1} and LOQ = 05.74, 0.2036 and 5.684 µg ml-1 are calculated for GMF, MXF and GAF, respectively. The values of SD are = 0.0218 - 0.0297, 0.02 - 0.0377 and 0.0216 - 0.0282 and RSD are = 0.0554 - 0.3075, 0.0380 - 0.4344 and 0.0537 - 0.3497 % for GMF, MXF and GAF. The method is applied for the assay of investigated three drugs in pharmaceutical dosage forms. The results are in good agreement with those obtained by the official methods.

Keywords: Gemifloxacin mesylate; Moxifloxacin. HCL; Gatifloxacin sesquihydrate; Ion pair formation; Spectrophotometry.

271. Evaluation of Neopterin as A Prognostic Factor in Patients With Beta-Thalassemia, in Comparison with Cytokines and Immunoglobulins

A.M. Abo Shanab, M.A. El-Desouky, N. Kholoussi, G. El-Kamah and A.A. Fahmi

Investigation of whether the serum level of neopterin can be used as a marker in patients with β-thalassemia, evaluation of its clinical significance and correlation with other laboratory and clinical parameters, including the cytokines interleukin-4 (IL-4), interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF-a), high sensitive C-reactive protein (hs-CRP) and immunoglobulins.

Method Study was made of 20 healthy subjects and 56 patients with β -thalassemia, ranging in age from 3 to 25 years. The serum levels of human neopterin, IL-4, IL-6 and TNF-a were determined by the ELISA method, and of hs-CRP and immunoglobulins IgA, IgM, IgG and IgG subclasses IgG1, IgG2, IgG3 and IgG4 by the nephelometric technique.

Results The serum levels of neopterin, IL-6, TNF-a and hs-CRP were significantly higher in patients with β -thalassemia than in normal subjects, but the level of IL-4 was the same in the two groups. The levels of immunoglobulins IgA and IgG, as well as IgG subclasses IgG1, IgG2, IgG3 and IgG4 were significantly higher in patients with β -thalassemia, but the level of IgM was the same as in normal subjects.

Conclusions The increased serum level of neopterin found in patients with β-thalassemia may be due to inflammation occurring with frequent blood transfusions. The increase in neopterin was associated with elevation in hs-CRP, cytokines IL-6 and TNF-a, and immunoglobulins IgA, IgG and IgG subclasses, and was not affected by sex or age.

Keywords: β-Thalassemia; Cytokines; Hs-CRP; Immunoglobulin; Neopterin.

Dept. of Entomology

272. Targeted Silencing of the Aquaporin 2 Gene of Rhipicephalus (Boophilus) Microplus Reduces Tick Fitness

Hala E. Hussein, Glen A. Scoles, Massaro W. Ueti, Carlos E. Suarez, Fatma K. Adham, Felix D. Guerrero and Reginaldo G. Bastos

Background: Ticks are blood-feeding arthropods that can affect human and animal health both directly by blood-feeding and indirectly by transmitting pathogens. The cattle tick Rhipicephalus (Boophilus) microplus is one of the most economically important ectoparasites of bovines worldwide and it is responsible for the transmission of the protozoan Babesia bovis, the etiological agent of bovine babesiosis. Aquaporins (AQPs) are water channel proteins implicated in physiological mechanisms of osmoregulation. Members of the AQP family are critical for blood-feeding arthropods considering the extreme osmoregulatory changes that occur during their feeding. We investigated the pattern of expression of a newly identified AQP2 gene of R. microplus (RmAQP2) in different tick tissues and stages. We also examined in vivo the biological implications of silencing expression of RmAQP2 silencing during tick feeding on either uninfected or B. bovis-infected cattle.

Methods: In silico gene analyses were performed by multiple alignments of amino acid sequences and topology prediction. Levels of RmAQP2 transcripts in different tick tissues and stages were analyzed by reverse transcriptase quantitative PCR. Patterns of expression of RmAQP2 protein were investigated by immunoblots. Gene silencing was performed by RNA interference and in vivo functional analyses carried out by feeding ticks on either uninfected or B. bovis-infected cattle.

Results: RmAQP2 transcripts were found in unfed larvae, engorged nymphs, and salivary glands and guts of partially engorged females; however, of all tick tissues and stages examined, RmAQP2 protein was found only in salivary glands of partially engorged females. RmAQP2 silencing significantly reduced tick fitness and completely abrogated protein expression. The effect of RmAQP2 silencing on fitness was more pronounced in females fed on a B. bovis-infected calf than in ticks fed on an uninfected calf and none of their larval progeny survived.

Conclusions: Collectively, considering the gene expression and tick fitness data, we conclude that RmAQP2 is critical for tick blood feeding and may be a suitable candidate target for the development of novel strategies to control R. microplus and tick-borne parasites.

Keywords: Rhipicephalus (boophilus) microplus; Aquaporin; Tick fitness; RNA interference; Gene silencing; Babesia bovis.

273. Effect of Artemether on Cytokine Profile and Egg Induced Pathology in Murine Schistosomiasis Mansoni

Neveen A. Madbouly, Ibraheem R. Shalash, Somaya O. El Deeb and Azza M. El Amir

Artemether (ART), the methylated derivative of artemisinin, is an efficacious antimalarial drug that also displays antischistosomal

properties. This study was designed to evaluate the immunomodulatory action of a single intramuscular dose (50 mg/kg body weight) of ART in comparison with PZQ treatment (42 days PI). ART administration was 7, 14, 21 and 45 days PI. ART effect was studied parasitologically, histopathologically and immunologically. It was found that maximum effect was reached when ART treatment interfered with 14 or 21 days old schistosomula. ART treatment 14 or 21 days PI was associated with shift from Th2 to Th1 predominancy (decrease in IL-4 and upgrading of serum IFN-c levels). In conclusion, ART is a promising drug in control of schistosomiasis mansoni due to its reductive effect on worm burden and its role in improvement of hepatic granulomatous lesions.

Keywords: Schistosomiasis; Artemether; IFN-γ; IL-4; IL-10.

274. Preparation and Characterization of Biologically Active Novel Copper Ion-Pairs of Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

Mohamed A. Zayed, Mamdouh I. Nassar and Ali M. EL-Gizouli

Journal of Thermal Analysis and Calorimetry, 120: 959-972 (2015) IF: 2.042

The present work is concerned with preparation, separation and structure elucidation of solid ion-pairs of nonsteroidal anti-inflammatory drugs in reaction to copper(II) ion. The prepared solid ion-pairs were investigated by different analytical techniques, such as FT-IR, mass and thermogravimetric and differential thermal analyses, in addition to elemental analysis. The general formulae of the prepared ion-pairs were determined. Moreover, the formulae of prepared ion-pairs were proposed and structurally identified. The biological activities of the separated solid ion-pairs toward some kinds of insect species in flour mills in comparison with their drugs were studied, and they were found to be biologically active more than their parent drugs. Graphical Abstract The present work involved the preparation, separation and structures elucidation of Cu(II) ion-pairs of nonsteroidal anti-inflammatory drugs (NSAIDs). Their proposed structures (a–d) are given.

Keywords: Anti-inflammatory drugs (NSAIDs); Copper–nsaids ion-pairs; Thermal; Spectroscopic; Biological activities.

275. Survey of the Genetic Diversity of Forensically Important Chrysomya (Diptera: Calliphoridae) from Egypt

Abeer M. Salem, Fatma K. Adham and Christine J. Picard

Journal of Medical Entomology, 52: 320-328 (2015) IF: 1.953

Minimum postmortem interval estimations of a corpse using blow fly larvae in medicolegal investigations require correct identification and the application of appropriate developmental data of the identified fly species. Species identification of forensically relevant blow flies could be very difficult and time consuming when specimens are damaged or in the event of morphologically indistinguishable immature stages, which are most common at crime scenes. In response to this, an alternative, accurate determination of species may depend on sequencing and molecular techniques for identification. Chrysomyinae specimens (n¼158) belonging to three forensically important species [Chrysomya albiceps (Wiedemann), Chrysomya megacephala (F.), and Chrysomya marginalis (Wiedemann)] (Diptera: Calliphoridae) were collected from four locations in Egypt (Giza, Dayrout, Minya, and North Sinai) and sequenced across the mitochondrial cytochrome oxidase subunit I (COI) gene. Phylogenetic analyses using neighbor–joining, maximum likelihood and maximum parsimony methods resulted in the same topological structure and confirmed DNA based identification of all specimens. Interspecific divergence between pairs of species was 5.3% (C. marginalis–C. megacephala), 7% (C. albiceps–C. megacephala), and 8% (C. albiceps–C. marginalis). These divergences are sufficient to confirm the utility of cytochrome oxidase subunit I gene in the molecular identification of these flies in Egypt. Importantly, the maximum intraspecific divergence among individuals within a species was<1% and the least nucleotide divergence between species used for phylogenetic analysis was 3.6% . This study highlights the need for thorough and diverse sampling to capture all of the possible genetic diversity if DNA barcoding is to be used for molecular identification.

Keywords: Blow fly; Forensic entomology; COI; Phylogenetic analysis.

276. Isolation, Characterization, Kinetics, and Enzymatic and Nonenzymatic Microbicidal Activities of A Novel C-Type Lysozyme From Plasma of Schistocerca Gregaria (Orthoptera: Acrididae)

Mohamed Elmogy, Taha T. M. Bassal, Hesham A. Yousef, Moataza A. Dorrah, Amr A. Mohamed and Bernard Duvic

Journal of Insect Science, 15(1): (2015) IF: 1.025

A protein, designated as Sgl, showing a muramidase lytic activity to the cell wall of the Gram-positive bacterium Micrococcus lysodeikticus was isolated for the first time from plasma of Escherichia coli-immunized fifth instar Schistocerca gregaria. The isolated Sgl was detected as a single protein band, on both native- and SDS-PAGE, has a molecular weight of ~15.7 kDa and an isoelectric point (pI) of ca 9.3 and its antiserum has specifically recognized its isolated form. Fifty-nine percentage of Sgl lytic activity was recovered in the isolated fractions and yielded ca 126-fold increase in specific activity than that of the crude. The partial N-terminal amino acid sequence of the Sgl has 55 and 40% amino acid identity with Bombyx mori and Gallus gallus c-type lysozymes, respectively. The antibacterial activity against the Gram-positive and the Gram-negative bacteria were comparatively stronger than that of the hen egg white lysozyme (HEWL). The detected Sgl poration to the inner membrane that reach a maximum ability after 3h was suggested to operate as a nonenzymatic mechanism for Gram-negative bacterial cell lysis, as tested in a permease-deficient E. coli, ML-35 strain. Sgl showed a maximal muramidase activity at pH 6.2, 30–50°C, and 0.05M Ca2+ or Mg2+; and has a Km of 0.5 µg/ml and a Vmax of 0.518 with M. lysodeikticus as a substrate. The Sgl displayed a chitinase activity against chitin with a Km of 0.93 mg/ml and a Vmax of 1.63.

Keywords: Schistocerca gregaria; Antibacterial activity; Kinetics; Lysozyme C; Muramidase.

277. Five New Records of Bee Flies (Bombyliidae, Diptera) From Saudi Arabia With Zoogeographical Remarks

Magdi S. El-Hawagry and Hathal M. Al Dhafer

Five bee-fly species (Bombyliidae, Diptera) have been listed in this paper as new to the Kingdom of Saudi Arabia. Four of the recorded species have been identified to the level of species, namely: Bombomyia discoidea (Fabricius, 1794), Spogostylum candidum (Sack, 1909), Exoprosopa linearis Bezzi, 1924, and Exoprosopa minos (Meigen, 1804), while the fifth one only to genus, Desmatoneura sp. The species have been collected from Al-Baha and Asir Provinces in the south-western part of the Kingdom. One of the four identified species, Exoprosopa linearis, has an Afrotropical affinity, and another two, Spogostylum candidum and Bombomyia discoidea, have considerable Afrotropical distributions, and this result agrees to some extent with studies considering these parts of the Arabian Peninsula, including Al-Baha and Asir Provinces, having Afrotropical influences and may be included in the Afrotropical Region rather than in the Palaearctic Region or the Eremic zone.
Keywords: Asir; Abha; Garf raydah protected area; Baha; Jabal shada al A'ala protected area; Tihama; Afrotropical.

278. A Review of the Family Eulophidae (Hymenoptera: Chalcidoidea) of Egypt, With Thirty Three New Records

Neveen S. Gadallah, Zoya A. Yefremova, Ekaterina N. Yegorenkova, Ahmed M. Soliman,Usama M. Abu El-Ghiet and Yusuf A. Edmardash

A checklist of Eulophidae (excluding Entiinae) is presented based primarily on a total of 155 specimens collected from 23 localities in Egypt during the period of April 2012 to June 2014, mostly by sweep net. Altogether, 55 species in 22 genera and 3 subfamilies (Entedoninae, Eulophinae and Tetrastichinae) are recorded, of which 6 genera (Dicladocerus Westwood, Euplectrus Westwood, Entedon Dalman, Neotrichoporoides Girault, Sigmophora Rondani and Sympiesis F ö rster) and 33 species (60%) are newly reported for Egypt. The valid name and world distribution of each species are given; local distributions and host records for species previously recorded from Egypt are also given. Most of the species have a distribution characterized as Palaearctic, Afrotropical, or Indo-Malayan. About 4% are cosmopolitan in distribution.
Keywords: Parasitic wasps; Eulophinae; Entedoninae; Tetrastichinae.

279. First Record of Stephanidae (Hymenoptera, Stephanoidea) for the Fauna of Egypt

Neveen S. Gadallah and Yusuf A. Edmardash

The family Stephanidae (Hymenoptera, Stephanoidea) is recorded for the first time for the Egyptian fauna, with one species, Foenatopus bisignatus Aguiar & Jennings, 2010. A single specimen was collected among Acacia raddiana trees infested with Agrilus roscidus Kiesenwetter (Coleoptera, Buprestidae), which represents a likely new host record.
Keywords: Host record; Saint catherine; Egypt.

280. The Genus Apterogyna Latreille, 1809 in Egypt, with Three New Species (Hymenoptera: Bradynobaenidae: Apterogyninae)

Ahmed M. Soliman, Neveen S. Gadallah, Ahmed M. Al-Shahat and G. Pagliano

The genus Apterogyna Latreille is reviewed from Egypt, based on specimens collected from Wadi Digla (Cairo), Saint Catherine (South Sinai) and those deposited in Egyptian and Italian insect collections as well as recorded data from the literature. Five Apterogyna species were previously recorded from Egypt: A. grandii Invrea, A. latreillei Klug, A. mickeli Giner Mari, A. mocsaryi André, and A. olivieri Latreille. Three new species Apterogyna flavicapillata Soliman & Gadallah sp. nov. (South Sinai), A. oshaibahi Soliman & Gadallah sp. nov. (Wadi Digla), and A. similis Soliman & Gadallah sp. nov. (Giza) are described and illustrated. An illustrated key of eight Egyptian species of Apterogyna is given.
Keywords: Apterogyninae; Apterogyna; New species; Wadi digla; Saint catherine; Faunistic list.

281. The Genus Macroocula Panfilov in Egypt, With Two New Species (Hymenoptera: Bradynobaenidae: Apterogyninae)

Neveen S. Gadallah, Ahmed M. Soliman, Ahmed M. Al-Shahat and Mohammed T. Hossni

The genus Macroocula Panfilov in Egypt is reviewed. Seven species were previously recorded from Egypt: M. magna (Invrea, 1965), M. mahunkai Argaman, 1994, M. morawitzi (Radoszkowski, 1888), M. nigriventris (Invrea, 1960), M. nitida (Bischoff, 1920), M. savignyi (Klug, 1829) and M. sinaica (Invrea, 1963). Macroocula brothersi Gadallah & Soliman, sp. nov. (Egypt, Wadi Shab, Red Sea) and M. salehi Gadallah & Soliman, sp. nov. (Egypt, Wadi Shaghab, Aswan) are described and illustrated. The subspecies M. nitida nitida (Bischoff, 1920) and M. nitida patrizii (Invrea, 1932) are raised to species level. An illustrated key and a faunistic list of Macroocula species are given.
Keywords: New species; Bradynobaenid wasps; Faunistic list; Saudi Arabia; United Arab Emirates.

282. An Annotated Catalogue of the Iranian Alysiinae (Hymenoptera: Braconidae)

Neveen S. Gadallah, Hassan Ghahari, Francisco Javier Peris-Felipo and Maximilian Fischer

In the present study, a catalogue of the Iranian Alysiinae (Hymenoptera: Braconidae) is given. It is based on a detailed

study of all available published data. In total 78 species from 15 genera including Alloea Haliday, 1833 (1 species), Angelovia Zaykov, 1980 (1 species), Aphaereta Foerster, 1862 (2 species), Aspilota Foerster, 1862 (2 species), Chorebus Haliday, 1833 (42 species), Coelinidea Viereck, 1913 (2 species), Coloneura Foerster, 1862 (1 species), Dacnusa Haliday, 1833 (10 species), Dinotrema Foerster, 1862 (5 species), Idiasta Foerster, 1862 (1 species), Orthostigma Ratzeburg, 1844 (3 species), Phaenocarpa Foerster, 1862 (1 species), Protodacnusa Griffiths, 1964 (2 species), Pseudopezomachus Mantero, 1905 (2 species), and Synaldis Foerster, 1862 (3 species) are reported in this catalogue. Two species are new records for Iran: Coelinidea elegans (Curtis, 1829) and Dacnusa (Pachysema) aterrima Thomson, 1895. Also, a faunistic list with distribution data and host records is provided.
Keywords: Hymenoptera; Braconidae; Alysiinae; Faunistic list; New Records; Iran.

283. Addenda to the Insect Fauna of Al-Baha Province, Kingdom of Saudi Arabia with Zoogeographical Notes

Magdi S. El-Hawagry, Mostafa R. Sharaf, Hathal M. Al Dhafer, Hassan H. Fadl and Abdulrahman S. Aldawood

The first list of insects (Arthropoda: Hexapoda) of Al-Baha Province, Kingdom of Saudi Arabia (KSA) was published in 2013 and contained a total of 582 species. In the present study, 142 species belonging to 51 families and representing seven orders are added to the fauna of Al-Baha Province, bringing the total number of species now recorded from the province to 724. The reported species are assigned to recognized regional zoogeographical regions. Seventeen of the species are recorded for the first time for KSA, namely: Platypleura arabica Myers [Cicadidae, Hemiptera]; Cletomorpha sp.; Gonocerus juniperi Herrich-Schäffer [Coreidae, Hemiptera]; Coranus lateritius (Stål); Rhynocoris bipustulatus (Fieber) [Reduviidae, Hemiptera]; Cantacader iranicus Lis; Dictyla poecilla Drake & Hill [Tingidae, Hemiptera]; Mantispa scabricollis McLachlan [Mantispidae, Neuroptera]; Cerocoma schreberi Fabricius [Meloidae, Coleoptera]; Platypus parallelus (Fabricius) [Curculionidae, Coleoptera]; Zodion cinereum (Fabricius) [Conopidae, Diptera]; Ulidia firuficeps Becker [Ulidiidae, Diptera]; Atherigona reversura Villeneuve [Muscidae, Diptera]; Aplomya metallica (Wiedemann); Cylindromyia sp. [Tachinidae, Diptera]; Messor semirufus (André); and Nesomyrmex denticulatus (Mayr) [Formicidae, Hymenoptera]. Also, the reduviid bug Dasycnemus sahlbergi Bergroth, that was questionably recorded from KSA is confirmed herein as occurring in KSA. The generic name Peirates (Reduviidae, Hemiptera) and the specific name of Apis florae Fabricius (Apidae, Hymenoptera) were inadvertently misspelled in the original list and are corrected here. Zoogeographically, the present study supports the original study conclusion that the insect species composition of Al-Baha Province is strongly affiliated with the Afrotropical Region rather than to the Palearctic Region or the Eremic Zone. Our insect surveys emphasize the fact that parts of the Arabian Peninsula, including Al- Baha Province, ought to be considered part of the Afrotropical Region rather than in the Palaearctic Region or the Eremic Zone.
Keywords: Palaearctic; Afrotropical; Eremic; Insect species; Arabian peninsula; Tihama; Al-Sarah; Al-Sarawat mountains.

284. The Genus Apterogyna in Saudi Arabia, with Description of A New Species and A New Record (Hymenoptera: Bradynobaenidae: Apterogyninae)

Ahmed Mostafa Soliman, Neveen Samy Gadallah and Hathal Mohammed Al Dhafer

The genus Apterogyna Latreille, 1809 is reviewed from Saudi Arabia based on specimens collected from Rawdhat Farshet Sheaal (Al-Aflag), Rawdhat Al-Harmalyiah (Al-Quwayiyah), Ibex Reserve National Park (Hutet Beni Tamem) and Shada Al-Ala Mountain (Al-Baha). Two Apterogyna species were previously recorded from Saudi Arabia: A. mateui Giner Mari, 1945 and A. olivieri Latreille, 1809. A new species, A. shadaensis Soliman & Gadallah sp. n. (Al-Baha) is described and illustrated and a new record, A. similis Soliman & Gadallah, 2015 (Al-Aflag) is discovered. An illustrated key of four Saudi Arabian species of Apterogyna is given.
Keywords: Apterogyninae; Apterogyna; New species; Al-Baha; Saudi Arabia.

285. Infectivity of four Entomopathogenic Nematodes in Relation to Environmental Factors and their Effects on the Biochemistry of the Medfly Ceratitis capitata (Wied.) (Diptera: Tephritidae)

Eh Shaurub, N.A. Soliman, A.G. Hashem and A.M. abdel-Rahman

Late third instars of the medfly, Ceratitis capitata (Wied.), migrate from the host fruit into the soil and leaf litter beneath host trees, where they may become a target for entomopathogenic nematodes (EPNs). The effects of ultraviolet (UV) light, temperature, soil type (texture), and soil moisture level on infectivity of the four tested EPNs Heterorhabditis bacteriophora AS1, H. bacteriophora HP88, Steinernema carpocapsae ALL, and Steinernema riobrave ML29 to late third instars of C. capitata were evaluated. Biochemical alterations induced by the most virulent nematodes were quantified. The nematode infectivity decreased with increase in exposure time to UV light, whereas it increased with increase in temperature. Infectivity increased in sandy soil, whereas it decreased in silt and clay soils. Soils with high moisture levels decreased infectivity. Based on the 50% lethal concentration (LC50), H. bacteriophora AS1 and S. carpocapsae ALL were the most virulent heterorhabditid and steinernematid nematodes, respectively, with the highest virulence for H. bacteriophora AS1. The nematodes caused significant decline in total protein and cholesterol content of larvae and caused reduced activity of transaminases and phosphatases. In contrast, they significantly enhanced total glucose content. It can be concluded that the most optimum environmental conditions of the tested nematodes to elicit their infectivity against late third instars of C. capitata were sandy soil with 10% moisture level, ambient temperature of 25°C, and no exposure to UV. The EPNs tested can affect late third instars of C. capitata by targeting different biochemical molecules in different metabolic pathways. The interaction between them and the host larvae appears to be primarily nutritional.
Keywords: Abiotic factors; Entomopathogenic Nematodes; Enzymes; Metabolites.

286. Profiling of Proteins and Proteases in the Products of the Salivary Gland, Digestive Tract and Excretions from Larvae of the Camel Nasal Botfly, Cephalopina Titillator (Clark)

Hesham A. Yousef, Amira Afify, Afaf Abdel Meguid and Hany M. Hassan

Proteins and proteolytic activities in the contents of the salivary gland (SGc), digestive tract (DTc) and excretory-secretory products (ESP) from larvae of the camel nasal botfly Cephalopina titillator were separated electrophoretically, and characterized. The protein profiles of the different samples were qualitatively quite similar in the larval stages L2 and L3. Zymogram analysis of proteases in the samples indicated that the digestive tract contained a greater variety of proteases than the salivary gland or the excretory-secretory products. They are mainly serine proteases. Proteases of ESP and DTc (especially of 3rd instar) contain trypsin- and chymotrypsin-like serine proteases, while the serine proteases of SGc are not of the trypsin- or chymotrypsin-type.
Keywords: Cephalopina titillator; Digestive tract; Excretory-secretory products; Proteases; Salivary glands.

287. Ichneumonidae Latreille, 1802 (Hymenoptera) Diversity in Alfalfa Fields (Medicago Sativa L.) From Two Western Desert Oases

Neveen S. Gadallah, U. M. Abu El-Ghiet, Y. A. Edmardash and F. J. Peris-felipo

Diversity of Ichneumonidae was studied in alfalfa fields (Medicago sativa L.) in two Egyptian Oases Bahariya and Farafra. A total of 206 specimens belong to 8 subfamilies, 14 genera and 24 species. Seven species are recorded for the first time from Egypt.
Keywords: Ichneumonidae; Diversity; Alfalfa fields; New records; Oasis; Egypt.

288. A Study on the Ichneumonid Wasps (Hymenoptera: Ichneumonidae) from Isfahan Province, Iran

H. Ghahari and N. S. Gadallah

The fauna of ichneumonid wasps (Hymenoptera: Ichneumonidae) from Isfahan province (Iran) is studied in this paper. In total 28 species from 24 genera and 6 subfamilies (Campopleginae, Cryptinae, Ichneumoninae, Ophioninae, Pimplinae and Tryphoninae) were collected and identified. Encrateola laevigata (Ratzeburg, 1848), Mesoleptus laticintus (Walker, 1874) (Cryptinae), Hepiopelmus melanogaster (Gmelin, 1790) (Ichneumonidae), and Apechthis quadridentata (Thomson, 1877) (Pimplinae) are new records for the fauna of Iran.
Keywords: Hymenoptera; Ichneumonidae; Fauna; Isfahan; Iran.

Dept. of Geology

289. Single Zircon Hf–O Isotope Constraints on the Origin of A-Type Granites From the Jabal Al-Hassir Ring Complex, Saudi Arabia

Kamal A. Alia, Adel A. Surour, Martin J. Whitehouse and Arild Andresen

The Jabal Al-Hassir ring complex in the southern Arabian Shield is an alkaline granite complex comprising an inner core of biotite granite that outwardly becomes a porphyritic sodic-calcic amphibole (ferrobarroisite–katophorite) granite. A combined study of mineral chemistry and single zircon Hf–O zircon isotope analyses was carried out to infer the magma sources of the Neoproterozoic post-collisional A-type granitoids in Saudi Arabia. The granitic rocks show high positive initial εHf(t) values of +7.0 to +10.3 and d18O values of +5.8‰ to +7.4‰ that are consistent with melting of a juvenile crustal protolith that was formed during the Neoproterozoic assembly of the Arabian-Nubian Shield (ANS). Crustal-model ages (Hf-tNC) of 0.71–0.94 Ga indicate minor contribution from an older continental crust in the formation of the Jabal Al-Hassir granitic rocks (crystallization age = 620 ±3 Ma), but any such component is likely to be Neoproterozoic in age. Temperature and oxygen fugacity (fO2) estimates suggested that the Jabal Al-Hassir A-type granite magma was generated at high temperature (820–1050 °C) and low fO2. Geochemical characteristics (e.g., low fO2), geochronological data, and Hf and O isotope compositions, indicate that the magmas of the Neoproterozoic A-type granites of the Jabal Al-Hassir ring complex were likely generated by crustal partial melting of a juvenile Neoproterozoic lower crustal tholeiitic rocks, following collision between East and West Gondwana in the final stages of the evolution of the Arabian Shield.
Keywords: Arabian-nubian shield; Single zircon Hf–O isotopes; A-Type granites; Ring complex; Neoproterozoic juvenile crust.

290. Timing and Characteristics of Late Pleistocene and Holocene Wetter Periods in the Eastern Desert and Sinai of Egypt, Based on ^{14}C Dating and Stable Isotope Analysis of Spring Tufa Deposits

Mohamed A. Hamdan and George A. Brook

There is very little dated evidence on wet periods in the Eastern Desert and Sinai Peninsula of Egypt during the Late Pleistocene and Holocene. To obtain such information, we have studied the petrography, isotope geochemistry and AMS radiocarbon ages of mostly relict tufas deposited by springs draining perched ground water bodies in metamorphic and volcanic rocks. The tufas unconformably overly Precambrian basic igneous rocks (basalt, diabase and gabbro). As the ages of tufa carbonate are frequently older than the true ages of the deposits because of the incorporation of old, 14C-dead carbon, we have dated both the carbonate matrix and insoluble organic material of the tufas. These ages show that the tufas were largely formed during two broad time periods, the most recent from 12,058 to 6678 cal yr BP (African Humid Period), and the other from ~31,200–22,500 cal yr BP, with preferential growth during the coldest times of this

period namely during Heinrich Events 2 and 3 (H2 and H3) and the Last Glacial Maximum (LGM). The time span between 19,000–9000 cal yr BP, including the YD and H1, appears to have been relatively more arid than the earlier LGM or H2 periods or the later Holocene. The Late Pleistocene tufas are depleted in 18O relative to the Holocene tufas and were deposited at a lower temperature (~14.0°–20.8 °C vs. 18.4°–23.4 °C). We believe that the Holocene tufas in the Sinai were formed by rainfall from the Mediterranean and those in the southern part of the Eastern Desert by African monsoon rainfall derived from the Red Sea-Gulf of Aden and Indian Ocean. In contrast, the moisture that fed the Late Pleistocene tufas, which are depleted in 18O relative to Holocene deposits, and progressively depleted from north to south, was probably brought by the Westerlies from the Atlantic-Mediterranean Sea when the Westerly circulation was pushed southwards during the coldest periods of the Late Pleistocene. Periods of tufa deposition correlate with major documented paleoclimatic events in North Africa during the late Pleistocene and Holocene; such as the Nile floods, high sea level and the formation of sapropels in the Mediterranean.

Keywords: Egypt; Eastern desert; Sinai; Tufa; Isotopes; Pleistocene; Holocene; Paleoclimate.

291. The Modern Nile Sediment System: Processes and Products

Eduardo Garzant, Sergio ando, Marta Padoan, Giovanni Vezzoli and Ahmed El Kammar

We trace compositional changes of Nile sediments for 7400 km, from their sources in equatorial rift highlands of Burundi and Rwanda to their sink in the Mediterranean Sea. All chemical and physical controls on sediment petrography, mineralogy and geochemistry, including weathering, grain-size, hydraulic sorting, mechanical breakdown, anthropic impact, mixing and recycling are investigated in detail. The Nile course is controlled along its entire length by the East African–Red Sea Rift. In this anorogenic setting, detritus is derived in various proportions from volcanic fields associated with tectonic extension (Anorogenic Volcanic provenance) and from igneous, metamorphic and sedimentary rocks uplifted on the rift shoulders or exposed on the craton (Continental Block provenance). The entire spectrum of such detrital signatures is displayed in the Nile catchment. Volcaniclastic Atbara sand is generated by focused erosion of the Ethiopian basaltic plateau in semiarid climate, whereas quartzose White Nile sand reflects low erosion rates, extensive weathering and sediment trapping in lakes and swamps at equatorial to subequatorial latitudes. In the main Nile, as in its main tributary the Blue Nile, suspended load is volcaniclastic, whereas feldspatho-quartzose bedload is derived largely from basement sources, with fine to medium-grained eolian sand added along the lower course. Mixing of detrital populations with different provenance and grain size is reflected in diverse violations of settling-equivalence relationships in fluvial and deltaic sediments. Sediment delivery from Sudan has been cut off after closure of the Aswan High Dam and accelerated erosion of deltaic cusps is leading to local formation of placer lags dominated by ultradense Fe–Ti–Cr oxides, but mineralogical changes caused by man's radical modification of fluvial regimes have been minor so far. In beaches of Sinai, Gaza and Israel, the Nile volcaniclastic trace gets progressively diluted by quartzose sand recycled from eolian

coastal deposits and carbonaticlastic detritus eroded from the Levant rift shoulder. Studying the compositional variability of modern sediments in big-river systems allows us to appreciate the richness of natural processes occurring in the vast drainage basin, and provides us with a key to understand the information stored in sedimentary archives and to reconstruct the evolution of the Earth's surface from the recent to the less recent past.

Keywords: Sedimentary petrology and provenance; Models; anorogenic volcanic provenance; Continental block provenance; Geochemistry and chemical weathering; Heavy minerals and hydraulic sorting; Sediment mixing and recycling; Erosion rates and sediment budgets; Long-distance littoral transport.

292. Hydrogeochemical Evolution of Inland Lakes' Water: A Study of Major Element Geochemistry in the Wadi El Raiyan Depression, Egypt

Essam A. Mohamed, Ahmed M. El-Kammar, Mohamed M. Yehia and Hend S. Abu Salem

Wadi El Raiyan is a great depression located southwest of Cairo in the Western Desert of Egypt. Lake Qarun, located north of the study area, is a closed basin with a high evaporation rate. The source of water in the lake is agricultural and municipal drainage from the El Faiyum province. In 1973, Wadi El Raiyan was connected with the agricultural wastewater drainage system of the Faiyum province and received water that exceeded the capacity of Lake Qarun. Two hydrogeological regimes have been established in the area: (i) higher cultivated land and (ii) lower Wadi El Raiyan depression lakes. The agricultural drainage water of the cultivated land has been collected in one main drain (El Wadi Drain) and directed toward the Wadi El Raiyan depression, forming two lakes at different elevations (upper and lower). In the summer of 2012, the major chemical components were studied using data from 36 stations distributed over both hydrogeological regimes in addition to one water sample collected from Bahr Youssef, the main source of freshwater for the Faiyum province. Chemical analyses were made collaboratively. The major ion geochemical evolution of the drainage water recharging the El Raiyan depression was examined. Geochemically, the Bahr Youssef sample is considered the starting point in the geochemical evolution of the studied surface water. In the cultivated area, major-ion chemistry is generally influenced by chemical weathering of rocks and minerals that are associated with anthropogenic inputs, as well as diffuse urban and/or agricultural drainage. In the depression lakes, the water chemistry generally exhibits an evaporation-dependent evolutionary trend that is further modified by cation exchange and precipitation of carbonate minerals.

Keywords: Surface water; Major elements; Geochemical evolution; Faiyum; El Raiyan depression.

293. XPS and FTIR Spectroscopic Study on Microwave Treated High Phosphorus Iron Ore

Mamdouh Omran, Timo Fabritius, Ahmed M. Elmahdy, Nagui A. Abdel-Khalek, Mortada El-Aref and Abd El-Hamid Elmanawi

Basic Science Sector

A growing interest in microwave heating has emerged recently. Several potential microwave applications regarding minerals' processing have been investigated. This paper investigates the effect of microwave radiation on Egyptian high phosphorus iron ore. Three different iron ore samples have varying Fe_2O_3 and P_2O_5 contents and mineralogical textures were studied. A comparative study has been carried out between untreated and microwave treated iron ore. XRD and FTIR analyses showed that after microwave radiation the crystallinity of iron bearing minerals (hematite) increased, while the functional chemical groups of phosphorus bearing minerals (fluorapatite) and other gangues dissociated. High resolution XPS analyses of Fe 2p peaks showed that after microwave radiation a portion of Fe(+III) was reduced to Fe(+II). This means that after microwave radiation iron oxide (hematite, Fe^{3+}) transformed into more magnetic phase. The results indicated that microwave radiation had a positive effect on the magnetic properties of iron oxide, through formation of ferromagnetic phases.

Keywords: High phosphorus iron ore; Microwave treatment; XPS; FTIR.

294. Microbial Pathways and Palaeoenvironmental Conditions Involved in the Formation of Phosphorite Grains, Safaga District, Egypt

Walid Salama, Ahmed El-Kammar, Martin Saunders, Rania Morsy and Charlie Kong

Phosphatic grains of the shallow marine phosphorite deposits of Egypt are classified as either phosphatic bioclasts preserving biological structure (e.g. skeletal fragments such as fish bones and teeth) or phosphatic peloids and intraclasts. This study describes the destructive and constructive microbial pathways represented by bioerosion of bones by endolithic cyanobacteria and accretion of phosphatic peloids by bacteria. The palaeoenvironmental conditions and post-depositional/diagenetic history of these grains have also been considered. Scanning and transmission electron microscopy showed that the phosphatic peloids under transmitted light microscopy are composed mainly of microspheres (0.5 to 2.5 μm) similar in shape and size to coccoidlike bacteria. Chemical mapping showed that these microspheres are composed of carbonate-fluorapatite (CFA) and surrounded by degraded carbonaceous matrix. These grains are suggested to be reworked from preexisting microbial mats during transgressive–regressive cycles affecting the southern Tethyan Campanian– Maastrichtian shallow continental shelf. The bioerosion of phosphatic bones is characterized by a network of meandering microborings that penetrated inward from the bone surface by endolithic cyanobacteria. The bioerosion of bones resulted in a gradual centripetal digestion and conversion of bones into micritic phosphate peloids. The bioerosion mechanism is probably started in the acidic sheath surrounding cyanobacteria followed by supersaturation of PO4 and reprecipitation of crystalline CFA as electron dense remineralized rims. Electron microprobe microanalyses showed that the remineralized microbored areas are higher in CaO, P2O5, and F and depleted in Cl, relative to unaltered bones. A gradual demineralization of remineralized rims followed by dissolution of cyanobacterial cells is probably occurred during diagenesis and meteoricwater alteration leaving behind empty microborings. Bone exposed to meteoric water alteration is lower in CaO and P2O5 and higher in F and Cl than the unaltered bones. Understanding bone bioerosion has significant implications for palaeoenvironmental and taphonomic reconstruction, archaeological applications and a regional correlation of the late Cretaceous to Palaeogene phosphogenic province extending from Middle East to North Africa.

Keywords: Phosphorite grains; Bone; Bioerosion; Bacteria; Egypt.

295. Digital Quantification of the Miospore Coloration to Assess the Thermal Maturity: Novel RGB-Based Measuring Technique

Walid A. Makled and Sameh S. Tahoun

The post depositional thermal maturity and its related chemical changes induce the sporomorphs color alteration, which is a common useful tool in the optical microscopy of the organic matters (OM) and their pre-geochemical studies. The present contribution uses the modern available opportunity of digital technology to achieve a quantifying system technique, which includes color measurements and their possible graphic presentation. The normal digital images of sporomorphs from several ages and geological settings are used to obtain color measurements in the form of digital Red, Green and Blue triple color system (RGB). These measurements were accomplished using some software programs such as Photoshop™© or ImageJ with employing average microscope setup. The triple RGB color readings are plotted on a ternary diagram, which is divided into three fields. These fields express the maturity levels. The presented new RGB-based quantifying technique is economic and provides a simple examination for maturity, which is linked to the hydrocarbon generation. This can partially replace or walk side by side with the vitrinite reflectance microscopy.

Keywords: Sporomorph coloration alteration; Thermal maturity; Digital quantification of miospore coloration; RGB color assessment.

296. Volcano-Sedimentary Characteristics in the Abu Treifiya Basin, Cairo–Suez District, Egypt: Example of Dynamics and Fluidization Over Sedimentary and Volcaniclastic Beds by Emplacement of Syn-volcanic Basaltic Rocks

E.A. Khalaf, A. Abdel Motelib, M.S. Hammed and A.H. El Manawi

This paper describes the Neogene lava–sediment mingling fromthe Abu Treifiya Basin, Cairo–Suez district, Egypt. The lava–sediment interactions as peperites have been identified for the first time at the study area and can be used as paleoenvironmental indicators. The identification of peperite reflects contemporaneous timerelationship between volcanism and sedimentation and this finding is of primary importance to address the evolutional reconstruction of the Abu Treifiya Basin. Characterization of the facies architecture and textural framework of peperites was carried out through detailed description and interpretation of their outcrops. The peperites and sedimentary

rocks are up to 350 m thick and form a distinct stratigraphic framework of diverse lithology that is widespread over several kilometers at the study area. Lateral and vertical facies of the peperites vary from sediment intercalated with the extrusive/intrusive basaltic rocks forming peperitic breccias to lava–sediment contacts at a large to small scales, respectively. Peperites encompass five main facies types ascribed to: (i) carbonate sediments-hosted fluidal and blocky peperites, (ii) lava flow-hosted blocky peperites, (iii) volcaniclastics-hosted fluidal and blocky peperites, (iv) sandstone/ siltstone rocks-hosted blocky peperites, and (iv) debris-flows-hosted blocky peperites. Soft sediment deformation structures, vesiculated sediments, sediments filled-vesicles, and fractures in lava flows indicate that lava flows mingled with unconsolidated wet sediments. All the peperites in this study could be described as blocky or fluidal, but mixtures of different clast shapes occur regardless of the host sediment. The presence of fluidal and blocky juvenile clasts elucidates different eruptive styles, reflecting a ductile and brittle fragmentation. The gradual variation from fluidal to blocky peperite texture, producing the vertical grading is affected by influencing factors, e.g., the viscosity, magma temperature, confining pressure, sediment fluidization, and vapor film at the magma–sediment interactions. Peperites in the study area record deposition within a shallow marine and fluvio-lacustrine environment accumulated in a rift-related basin developed during pre- to syn-rift phase, respectively. The facies transitions (peperites) in this area resulted from the explosive and sediment depositional processes, which were mingled separately by volcanism under contrast geological conditions. The development of such contrast in the depositional sequences reflects variation in the accommodation to sediment supply in the same accumulation space inside the depocenters during the rifting of the Abu Treifiya Basin. Hydrothermal mineralizations comprising quartz and carbonate are restricted to peperites and lava flows.

Keywords: Pre-and syn-rift sedimentary sequences; Peperite; Grading; Lava flow; Hydromagmatism; Abu treifiya basin.

297. Spectroscopic Characterization of Iron Ores Formed in Different Geological Environments Using FTIR, XPS, Mössbauer Spectroscopy and Thermoanalyses

Walid Salama, Mourtada El Aref and Reinhard Gaupp

Application of thermoanalyses, FTIR, XPS and Mössbauer spectroscopic methods can differentiate between iron ores formed in different geological environments. Two types of iron ore are formed in shallow marine environments in the Bahariya Depression, Egypt, yellowish brown ooidal ironstones (type 1) and black mud and fossiliferous ironstones (type 2). Both types were subjected to subaerial weathering, producing a dark brown lateritic (pedogenic) iron ore (type 3). Microscopic investigation indicates goethite is the main mineral in types 1 and 3, while hematite is the main mineral in type 2 and also occurs in type 3. Thermoanalyses indicated the dehydroxylation endothermic peak of goethite of type 1 occurs between 329 and 345 C, while in type 3 occurs between 284 and 330 C. This variation can be attributed to the nanocrystalline nature of the pedogenic goethite. The presence of an exothermic peak at 754 C in type 3 is probably attributed to goethite-hematite phase transformation. FTIR

spectroscopy indicated that goethite of type 1 is characterized by the presence of the δ-OH band between 799 and 802 cm^{-1}, the c-OH between 898 and 904 cm^{-1} and the bulk hydroxyl stretch between 3124 and 3133 cm^{-1}. Goethite of type 3 is characterized by the absence of the bulk hydroxyl stretch band and the d-OH and c-OH are shifted to higher Wavenumbers that can attributed to a relative Al-for Fe-substitution. Hematite is identified by two IR bands; the first is between 464 and 475 cm^{-1} and at the second is between 540 and 557 cm^{-1}. Quartz is identified in all iron ore types, nitrates are identified in types 1 and 2, but absent in type 3 and Kaolinite is identified in type 2. The Mössbauer spectrum of type 1 is fitted with one magnetic sextet corresponding to goethite with an isomer shift (IS) = 0.374 mm s^{-1}, a quadruple splitting (QS) = -0.27 mm s^{-1} and a hyperfine magnetic field (BHF) = -37.The Mössbauer spectrum of type 2 is fitted with one magnetic sextet corresponding to hematite with IS = 0.363 mm s^{-1}, QS = -0.23 mm s^{-1} and BHF = -50. The Mössbauer spectrum of type 3 is best fitted with a single doublet corresponding to ferrihydrite and one sextet corresponding to hematite. The XPS survey scans and the high resolution of the Fe 2p3/2 can differentiate between the yellowish-brown and green ooidal laminae of type 1. The XPS survey scans indicate the presence of Fe, O, C, N, Na, Cl, Ca and Si in all laminae, while S, Zn, Ti and P are only restricted to the green laminae. The high resolution of the Fe 2p3/2 indicates that Fe is linked to OH- ligand in the yellowish-brown laminae that correspond to goethite, while Fe is linked to SO$_4$^{2}- ligand in the green laminae. The XPS survey scans of types 2 and 3 indicate that Fe is linked to O^{2-}ligand that corresponds to hematite.

Keywords: Thermoanalyses; XPS; FTIR; Mössbauer spectroscopy; Iron ores-Egypt.

298. Source of the Aeolian Dune Sand of Toshka Area, Southeastern Western Desert, Egypt

M.A. Hamdan, A.A. Refaat, E. Abu Anwar and N.A. Shallaly

Sedimentological, mineralogical and geochemical investigations were carried out in order to identify the probable source and mode of origin of the aeolian dune sand of the Toshka area at southeastern Western Desert, Egypt. A hundred and thirty sand samples were collected from the base, crest and slip face of barchan and linear dunes together with windward and interdune area and from (lee dunes and sand shadows). Grain size analysis of the collected sediments shows that most of the aeolian sand is generally fine-grained, moderately well sorted, fine skewed and leptokurtic. The anchored dunes (lee and sand shadows) are nearly similar and are the finest and best sorted of all the dune types of Toshka sands. Barchans are coarser while the linear dunes represent the least sorted dune sand. The textural, mineralogical and the geochemical results supported by statistical approach indicate that the Toshka sands were mainly derived from late Pleistocene dune sand with a minor contribution from local sources (Pleistocene alluvial sand and Holocene playa). These sands represent the proposed sources probably derived from the weathering of the Nubian sandstone since the mid-Tertiary by fluvial streams and lakes during earlier humid periods and by aeolian processes during arid periods.

Keywords: Sedimentology; Toshka; Western desert; Egypt.

299. Mineralogy and Grain Morphology of the Aeolian Dune Sand of Toshka Area, Southeastern Western Desert, Egypt

A.A. Refaat and M.A. Hamdan

This work investigates the mineralogical properties and the morphology of aeolian quartz sand in the Toshka dune area, southeastern Western Desert of Egypt. The dunes are composed mostly of subangular to subrounded fine to medium quartz sands together with minor proportions of feldspars and lithic fragments. Significant roundness variations are observed both between different dune types and within the dune sites. Barchan sands are the most rounded, whilst sand shadows are angular and fine. Barchans are also relatively enriched in polycrystalline quartz, where most of these grains are more rounded and more durable than monocrystalline quartz. Roundness characteristics of the Toshka sands are considerably managed by their grain size as medium quartz grains are more rounded than the finer ones. Angularity is a characteristic property of most monocrystalline quartz grains that exhibit undulose extinction. This maintenance of undulose extinction in quartz perhaps as a result of less stability and minimal transport from the source in the vicinity of the dune fields, as shown by the increase of angularity of quartz and short-distance transfer of these grains. These Toshka sand grains also show signs of a fluvial transportation signature. The analysis of grain surface features by scanning electron microscope (SEM) performed on dune sand grains from the Toshka area showed that quartz grains demonstrate a variety of surface textures indicating mechanical and chemical processes developed during transportation of these grains in subaqueous and aeolian environments, respectively, reflecting the mixed mode of formation of these dunes.

Keywords: Roundness; Dune sand; Toshka; Western desert; Egypt.

300. New Insights Into Microbially Induced Sedimentary Structures in Alkaline Hypersaline El Beida Lake, Wadi El Natrun, Egypt

Amany G. Taher and Ali Abdel-Motelib

Microbially induced sedimentary structures (MISS) were studied in detail in the alkaline hypersaline El Beida Lake of Wadi El Natrun in the western desert sector of Egypt, based on field observations and sampling performed in 2013 and 2014. Geomorphologically, the lake can be subdivided into three zones, each with characteristic sedimentary and biosedimentary structures. The marginal elevated zone that borders the lake is characterized by thick blocky crusts devoid of microbial mats. The middle–lower supratidal zone has luxuriant microbial mats associated with knotty surfaces, mat cracks and wrinkle structures. A zone of ephemeral shallow pools and channels is characterized by reticulate surfaces, pinnacle mats, sieve-like surfaces, gas domes and mat chips. In the microbial mats, authigenic minerals include thenardite Na_2SO_4, trona $Na_3(CO_3)(HCO_3) \cdot 2H_2O$ and halite $NaCl$. Scanning electron microscopy (SEM) analyses revealed that the minerals are closely associated with the MISS, suggesting some influence of microorganisms on mineral precipitation. Complex interactions

between regional hydrological cycles and diagenetic processes imply low preservation potential. MISS signatures of such saline lakes can serve as key analogues for interpreting the geologic record.

Keywords: Microbial mats; Alkaline; Wadi El natrun; Geologic record.

301. Regional Setting and Characteristics of the Neoproterozoic Wadi Hamama Zn–Cu–Ag–Au Prospect: Evidence for an Intra-Oceanic Island Arc-Hosted Volcanogenic Hydrothermal System

Yasser Abd El‑Rahman, Adel A. Surour, Abdel Hamid W. El‑Manawi, Abdel‑Monem A. El‑Dougdoug and Sayed Omar

The Wadi Hamama area is a volcanogenic Zn–Cu–Au–Ag prospect. It is hosted by a Neoproterozoic bimodal-mafic sequence, which comprises basalt, dacite and rhyolite along with volcaniclastic rocks. The rocks have a low-K tholeiitic affinity and are enriched in large ion lithophile elements over high field strength elements, which indicated their formation in an intra-oceanic island arc tectonic setting. The area was intruded by a tonalite–trondhjemite body, which has an intra-oceanic island arc affinity and later by diorite, which has a cordilleran-margin geochemical affinity. These rock units were intruded by post-tectonic granite dykes, which have a within-plate geochemical signature. There is a quartz-carbonate horizon extending along the contact between the basalt and the volcaniclastic rocks, mainly banded and lapilli tuffs. This horizon is of exhalative origin and is underlain by a mushroom-shaped alteration zone extending from the horizon down to the massive basalt. The footwall alteration is characterized by a silica-rich core surrounded by a thick chlorite sheath. Both the quartz-carbonate horizon and the footwall-altered rocks enclose historical trenches and pits. Sulfide-rich core samples are enriched in Zn, relative to Cu, and in Ag, which indicates the low-temperature nature of the hydrothermal system. The prospect was affected by supergene processes, which led to the widespread occurrence of secondary copper minerals and gold enrichment relative to the leached base metals, especially Zn. The prospect formed through a limited rifting of an intra-oceanic island arc which resulted in the formation of a small-scale volcanogenic Zn–Cu–Ag–Au prospect.

Keywords: Volcanogenic; Base metal; Precious metal; Neoproterozoic; Island arc; Egypt.

302. Composition and Diagenesis of Ancient Shali City Buildings of Evaporite Stones(Kerchief), Siwa Oasis, Egypt

Ali Abdel-Motelib, Amany Tahe and Abdel-Hamid El Manawi

Shali is an ancient fortress, built in the XIIeXX century in Siwa, Northwest Egypt. It is built on two Middle Miocene limestone and marl hills, between the wadi plain. The architecture of the fortress buildings is composed of local materials derived from the Miocene, Quaternary, and recent salt lake deposits. The framework blocks of the city are mainly composed of salt

(Kerchief), limestone, and bentonite, wood particles, dry date seeds, and bones derived from ancient tombs. In this study, the modification and mineral phases that developed during the diagenetic alteration and cementation of the salt and clay mortars with different framework in the walls of the ancient houses and settlements will be followed and interpreted. Diagenesis included transportation of salt materials from the nearby Fetnas Lake and mixing with some sand and clays as mortar pressed into the voids between the frameworks (Kerchief blocks). This resulted in dehydration, gypsum crystallization, and halite cementation. The continuous crystallization through the epitaxial growth of halite in both cement and framework blocks results in strong adhesion and binding of the framework. At the end of the process the kerchief blocks and the cement will be completely homogenous to a point that they apparently no longer be distinguished.

Keywords: Shali; Salt houses; Kerchief; Halite; Cement; Diagenesis.

303. Structural and Textural Characteristics of Surface Halite Crusts of A Supratidal, Ephemeral Halite Pan, South Jeddah, Red Sea Coast, Saudi Arabia

Rushdi J. Taj and Mahmoud A. Aref

Two saline (halite and gypsum) pans have recently developed overlying lagoonal and sabkha sediments in the Sarum area, south Jeddah, Saudi Arabia, as a result of the construction of an asphaltic road 30 years ago. Structural and textural characteristics of the halite layers reflect their formation during flooding, evaporative concentration, and desiccation stages of the ephemeral halite pan. The flooding stage textures record partial dissolution of the halite crusts, resulting in the formation of truncation surfaces, microkarst pits, pipes, and vugs. Microbial mats can flourish within dissolution vugs, despite the ambient high salinity of the brine. The evaporative concentration stage is characterized by the formation of thick, flat, halite crusts, in addition to isolated masses resembling cauliflowers, mushrooms, and platforms. The halite crusts and isolated masses consist of cumulate rafts and pyramidal hoppers, chevrons, and cornets. Agitation of the brine by waves or currents induced by wind favors the formation of rippled and clastic halite. Desiccation stage textures are represented by polygonal fractures and ridges, chaotic mud-halite filling microkarst pits and pipes, overgrowths, and displacive and efflorescent halite crystals. Field and petrographic studies and major element geochemistry of the brine indicate that the main recharge to the halite pan is from numerous seawater seepage points without direct connection to the Red Sea water or surface drainage. The results of this study provide valuable sedimentological information that could be useful in the interpretation of similar ancient halite.

Keywords: Halite pan; Flooding; Evaporative concentration; Desiccation; Seawater seepage points; Saudi Arabia.

304. Source-Rock Evaluation of the Dakhla Formation Black Shale in Gebel Duwi, Quseir Area, Egypt

M.M. El Kammar

A relatively thick Upper Cretaceous – Lower Tertiary sedimentary succession is exposed in Gebel Duwi, Red Sea area, through an almost horizontal tunnel cutting the NE dipping strata from Quseir to Thebes formations. The black shale belonging to Dakhla Formation represents a real potential for future energy resource for Egypt. Dakhla Formation consists mainly of organic-rich calcareous shale to argillaceous limestone that can be considered as a good to excellent source rock potential. The total organic carbon (TOC) content ranges from 2.04 to 12.08 %, and the hydrogen index (HI) values range from 382 to 1024 mg HC/g TOC. Samples of the Dakhla Formation contain mostly kerogen of types I and II that prone oil and oil-gas, indicating marine organic matter derived mainly from algae and phytoplankton organisms and proposing typical oil source kerogen. The average of the potential index (PI) value is 0.02 mg HC/g rock, which indicates the beginning of a considerable amount of oil generation from the Dakhla Formation. The Tmax values range from 427 to 435°C. Based on the Tmax data and PI values, the studied black shale samples are immature to early mature for hydrocarbon generation in the Duwi area. The data reduction suggests four main factors covering about 91% of the total variances. The average of the calorific value (459 kcal/kg) indicates unworkable efficiency of such black shale for direct combustion use in power stations. However, selective operation of specific horizons having the highest calorific values may provide viable resources.

Keywords: Black shale; Source rock; Duwi; Dakhla formation; Kerogen; Calorific value.

305. Cu–Mn–Fe Alloys and Mn-Rich Amphiboles in Ancient Copper Slags From the Jabal Samran Area, Saudi Arabia: With Synopsis on Chemistry of Fe–Mn(III) Oxyhydroxides in Alteration Zones

Adel A. Surour

In the Jabal Samran area (western Saudi Arabia), secondary copper mineralization in a NE-trending shear zone in which the arc metavolcanic host rocks (dacite–rhyodacite) show conjugate fractures and extensive hydrothermal alteration and bleaching. The zones contain frequent Fe–Mn(III) oxyhydroxides (FeOH–MnOH) that resulted from oxidation of pyrite and Mn-bearing silicates. In the bleached part, the groundmass is represented by Fe-bearing interstratified illite–smectite with up to 4.02 wt% FeO^t. FeOH–MnOH are pre-weathering phases formed by hydrothermal alteration in a submarine environment prior to uplifting. Five varieties of FeOH are distinguished, four of them are exclusively hydrothermal with ~20 wt% H2O whereas the fifth contains ~31–33 wt% H$_2$O and might represent reworking of earlier hydrothermal FeOH phases by weathering. FeOH fills thin fractures in the form of veinlets and crenulated laminae or as a pseudomorph for pyrite, goethite and finally ferrihydrite, and this oxyhydroxide is characterized by positive correlation of Fe$_2$O$_3$ with SiO$_2$ and Al$_2$O$_3$. On the other hand, MOH shows positive correlation between MnO2 and Al$_2$O$_3$ whereas it is negative between Fe$_2$O3 and SiO$_2$. Paratacamite is the most common secondary copper mineral that fills fractures and post-dates FeOH and MnOH. It is believed that Cl- in the structure of paratacamite represents inherited marine storage rather than from surficial evaporates or meteoric water. The mineralogy of slags suggests a complicated mineral assemblage that includes native Cu prills, synthetic spinifixed Mn-rich amphiboles with 16.73 wt% MnO,

brown glass and Ca–Mn–Fe phase close to the olivine structure. EMPA indicate that the some Cu prills have either grey discontinuous boarder zone of S-rich Mn–Cu alloy (with up to 21.95 wt% S and 19.45 wt% Mn) or grey Cu–Mn–Fe alloy (with up to 15.9 wt% Cu, 39. 12 wt% Mn and 61.64 wt% Fe). Mn in the Cu prills is expelled inward as Cu–Mn–Fe alloy inclusions whereas S is expelled outward as S-rich Mn–Cu alloy crust. Remains in the Samran smelter sites suggest the use of charcoal as a source of energy, quartzite as a flux and an air-cooling technique was used.

Keywords: Fe–mn (III) oxyhydroxide; Synthetic Mn-rich amphiboles; Cu prills; Slags.

306. Oligocene Lacustrine Tuff Facies, Abu Treifeya, Cairo-Suez Road, Egypt

Ali Abdel-Motelib, Mona Kabesh, Abdel Hamid El Manawi and Amir Said

Journal of African Earth Sciences, 102: 33-40 (2015) IF: 1.403

Field investigations in the Abu Treifeya area, Cairo-Suez District, revealed the presence of Oligocene lacustrine volcaniclastic deposits of lacustrine sequences associated with an Oligocene rift regime. The present study represents a new record of lacustrine zeolite deposits associated with saponite clay minerals contained within reworked clastic vitric tuffs. The different lithofacies associations of these clastic sequences are identified and described: volcaniclastic sedimentary facies represent episodic volcaniclastic reworking, redistribution and redeposition in a lacustrine environment and these deposits are subdivided into proximal and medial facies. Zeolite and smectite minerals are mainly found as authigenic crystals formed in vugs or crusts due to the reaction of volcanic glasses with saline–alkaline water or as alteration products of feldspars. The presence of abundant smectite (saponite) may be attributed to a warm climate, with alternating humid and dry conditions characterised by the existence of kaolinite. Reddish iron-rich paleosols record periods of non-deposition intercalated with the volcaniclastic tuff sequence.

Keywords: Zeolite; Lacustrine; Saponite; Pyroclastics; Abu Treifeya; Egypt.

307. Leiosphaeridia and Pterospermella Acritarch Genera as Shallowing Phase Indicators in the Early Jurassic, North Sinai, Egypt

Sameh S. Tahoun and Omar Mohamed

Arabian Journal of Geosciences, 8: 4581-4588 (2015) IF: 1.224

The first attempt in Egypt to throw the light on the importance of Leiosphaeridia and Pterospermella acritarch genera has been done in the present study. Five ditch-cutting samples collected from the Mashabba Formation in North Sinai have been palynologically investigated. This study demonstrates the stratigraphic importance of these genera in the Jurassic sediments and increases their value in future sequence stratigraphical and paleoenvironmental/paleoecological interpretations. Both genera in the subsurface Early Jurassic interval of the Mashabba Formation indicate shallow water conditions. A good relationship between the recovery of these genera and the coarsening of the clastics has been recognized. Moreover, high counts of these acritarchs genera

correlate with the increasing of sand content and vice versa. Hence, the abundance of Leiosphaeridia and Pterospermella can be an indication of the regressive events and associated low/fall sea levels in the Early Jurassic of Egypt.

Keywords: Acritarchs; Leiosphaeridia; Pterospermella; Early jurassic; Mashabba formation; North sinai; Egypt.

308. Palynomorph Biostratigraphy of the Cretaceous (Hauterivian-Lower Cenomanian) of the South Sallum Well, North Western Desert, Egypt

Sameh S. Tahoun, Tarek F. Mostafa, Walid A. Makled and Rehab A. Saleh

Arabian Journal of Geosciences, 8: 9205-9219 (2015) IF: 1.224

A palynological analysis has been carried out on the lower–middle Cretaceous rock units encountered in the subsurface section of the South Sallum well, north Western Desert of Egypt. Eighty-three ditch cutting samples have been analyzed palynologically and produced 71 species belonging to 49 genera, which allow recognizing ten informal sporomorph zones restricted to northern Western Desert ranging from early Cenomanian to Hauterivian. The erected palynozones are not only applicable to the western part of the Western Desert, but valid to the north Western Desert as well. They are correlated with well-documented zonations established for the same interval from other localities in the north Western Desert of Egypt and outside in north Africa.

Keywords: Cretaceous; Hauterivian–early cenomanian; Palynostratigraphy; Palynomorphs; Alam El-bueib; Alamain; Dahab; Kharita; Bahariya; Western desert; Egypt.

309. Sedimentological Characteristics of Continental Sabkha, South Western Desert, Egypt

Osama E. A. Attia and Hussien K. Hussien

Arabian Journal of Geosciences, 8: 7973-7991 (2015) IF: 1.224

Continental sabkha is recorded in the extreme middle part of the southWestern Desert of Egypt representing one of the most promising areas for sustainable development, especially for agriculture. The geomorphologic units of the area are formed under the influence of structural, lithological, and/or climatic controls. These units include pediplain, depressions,mass-wasted blocks, residual hills, drainage lines, and aeolian landforms. The effective deflation process is reinforced by the lack of protective vegetation cover and the susceptibility of weakly consolidated rocks to wind removal. Different rock units covering the area range in age from Early Cretaceous to Quaternary. Quaternary deposits include playa/sabkha deposits where the continental sabkha is divided into four zones A, B, C, and D. Underground waters coming from the north and east were progressively enriched in solute by interaction with the surrounding sedimentary and igneous rocks. Most of the evaporite minerals grow displacively as a result of evaporative pumping. Mineralogically, the continental sabkha salt complex includes gypsum, natroalunite, tamarugite, bloedite, eugsterite, nitratine, halite, and D'ansite. Some of the major and trace elements (SiO_2, Al_2O_3, Fe_2O_3, MgO, CaO, Na_2O, K_2O, as well as Rb, Ba, Zr, Sr, Y, V, and Zn) were measured. The correlation and enrichment of

these major and trace elements indicate the origin of the salt complex in the sabkha.

Keywords: Continental sabkha; Evaporites; Sedimentology; Geochemistry.

310. Sediment Characteristics and Microfacies Analysis of Jizan Supratidal Sabkha, Red Sea Coast, Saudi Arabia

Mohammed H. Basyoni and Mahmoud A. Aref

Arabian J. of Geosciences, 8 (11): 9973-9992 (2015) IF: 1.224

Jizan sabkha extends along the southeastern coastal plain of the Red Sea, Saudi Arabia, and is considered as one of the main problems that has a negative impact on infrastructure of buildings. Field examination of the surface of the wet sabkha area indicated the presence of sedimentary surface structures produced by physical forces such as adhesion ripples, tepee polygonal ridges, efflorescent halite pods, and structures produced by microbial activities such as petees and blisters. Microfacies analysis of the siliciclastic and evaporite lithofacies types has been done for sediment samples from the surface, trenches, and cores. The siliciclastic lithofacies type represents the host sediments in Jizan sabkha and consists of sand and mud. The evaporite lithofacies type is distinguished into three microfacies types of gypsum, anhydrite, and halite. The gypsum microfacies types are represented by diagenetic growth of individual lenticular, twinned lenticular, twinned complex lenticular, rosettes, nodular, poikilotopic, porphyroblastic, alabastrine, and clastic gypsum. The anhydrite microfacies types are represented by nodular and enterolithic anhydrite. The halite microfacies types are represented by primary rafts, cumulates, chevrons and cornets, and diagenetic overgrowth and mosaic halite cement. The structural and textural characteristics of the evaporite sediments indicated the formation of primary halite crystals at the brine surface and floor of saline pans, and the diagenetic formation of gypsum and anhydrite below the sediment surface as intrasediment displacive, inclusive, and replacive growth in the wet sandflat and mudflat areas. Recognition of such structural and textural features of the evaporite sediments helps in solving engineering geological problems in Jizan area and allowed also for interpreting the similar sabkha sediments in the rock record.

Keywords: Lenticular; Rosette gypsum; Nodular anhydrite; Basin zonation; Jizan sabkha; Saudi Arabia.

311. Hydrochemistry, Evolution, and Origin of Brines in Supratidal Saline Pans, South Jeddah, Red Sea Coast, Saudi Arabia

Rushdi J. Taj and Mahmoud A. Aref

Arabian J. of Geosciences, 8 (10): 8835-8851 (2015) IF: 1.224

The supratidal, saline pans and surrounding wet sabkha area, south Jeddah, Saudi Arabia, have seawater seepages with a salinity of 40‰ that increases to 80–140 and 220–375 ‰ during deposition of gypsum and halite, respectively. The concentration order of the dominant cations and anions in the saline pans is sodium (Na^+) > magnesium (Mg^{2+}) > potassium (K^+) > calcium (Ca^{2+}) and chloride (Cl^-) > sulfate ions (SO_4^{2-}) > bicarbonate ions (HCO_3^-), respectively. The dominant brine type is Mg and sodium chloride. Correlations of the various ions in the saline pans

indicate positive relations between $Na+$ and Cl^-, Na^+ and total dissolved solids (TDS), and Cl^- and TDS due to halite precipitation at a high salinity value. Negative correlations between Ca^{2+} and SO_4^{2-} and between Ca^{2+} and HCO_3^- are related to the reduction of SO_4^{2-} and oxidation of organic matter by sulfate-reducing bacteria, which is confirmed also by the positive correlation of HCO_3^- and alkalinity. The high Mg/Ca ratio is related to the enrichment of the brine with bittern salts such as $MgCl_2$ and KCl. The chemical data of the brines indicate their source from recent and old marine waters of $MgCl_2$ and $CaCl_2$ characters. The contribution of meteoric water has a minor effect on the composition of the brine in the saline pans.

Keywords: Brine chemistry; Evolution; Genesis; Saline pans Seawater seepage; Saudi Arabia.

312. Application of Remote Sensing for Gold Exploration in the Fawakhir Area, Central Eastern Desert of Egypt

Islam Abou El-Magd, Hassan Mohy and Fawzy Basta

Arabian Journal of Geosciences, 8: 3523-3536 (2015) IF: 1.224

Eastern desert of Egypt is well-endowed with noble mineral resources that provide challenges for the future economy and development in Egypt. Such mineral resources are not yet well-mapped and fully understood; however, various geological maps are available. The newly advanced sensors of earth observations such as advanced space thermal emission and reflection radiometer (ASTER) images were functioned to map the lithology, the structural patterns and the alteration zones related to gold mineralization at the Fawakhir area, Central Eastern Desert of Egypt. Integration of band rationing and principal component analysis (PCA) clearly determined the lithological units of the study area. The alteration zones of the study area were efficiently mapped from the ASTER radiance data using reference spectra based on two supervised classification techniques including the spectral angle mapper (SAM) and spectral information divergence (SID). Field visits and laboratory microscopic examination of thin and polished sections were used for validating the process. The final resulted map of the alteration mineral zones consists of sericite, clay minerals, quartz, carbonate, and pyrite. Auto-detection of the structural lineaments, which are zones of deformation and fracturing that implies secondary porosity, was mapped from the satellite image. These structures represent significant pathways for migration of hydrothermal solutions, which influence the creation of the alteration zones and become potential zones for mineral resources. The spatial analysis showed the high correlation between the density of lineaments and the occurrence of the alteration zones, which represent high probability of the presence of gold deposits that validated against the old gold mines.

Keywords: Aster; Gold mineralization; Alteration zones; Eastern desert; Egypt.

313. The Possible Origin of Hydrocarbon Generation Sourced from an Evaporative Environment: A Comparative Analog of Recent and Older Environments

M. M. El-Kammar, E. M. A. Abuassy, A. M. A. Walia and A. R. Abu El-Ezz

Petroleum Science and Technology, 33: 51-61 (2015) IF: 0.307

This work focuses on recent coastal sabkha at Ras Shukeir with older analogs of Miocene age from Gulf of Suez and Mediterranean Sea coast of North Sinai. Their presence represents indicators of prolific biological activity and productivity. TOC content, Rock-Eval pyrolysis, infrared spectroscopy and gas chromatography for kerogen of recent sabkha and core samples from both analogs justify the possibility of the evaporative environments as hydrocarbons generator. The evaporitic environments can produce organic matter leading to hydrocarbon potentialities upon reaching optimum maturation. The obtained results propose that recent sabkha can uphold enriched altitudes of TOC content. The older analog (e.g., Ras Gemsa, SE Zeit) is anticipated to yield fair to excellent content, containing kerogen of type I and II with intermittent type III. This indicates oil prone source rock derived mainly from algal and planktonic biomass together with bacterial residues accumulated under saline to hypersaline and moderately to moderately high reducing condition. This favors that the studied examples are analogs of possible generation of hydrocarbons sourced from evaporative environment.

Keywords: Bitumen; Gulf of Suez; Kerogen; Ras shukeir; Source rock.

Dept. of Geophysics

314. 2.5D Regularized Inversion for the Interpretation of Residual Gravity Data by A Dipping Thin Sheet: Numerical Examples and Case Studies with an Insight on Sensitivity and Non-Uniqueness

Salah A. Mehanee and Khalid S. Essa

A new two-and-a-half dimensional (2.5D) regularized inversion scheme has been developed for the interpretation of residual gravity data by a dipping thin-sheet model. This scheme solves for the characteristic inverse parameters (depth to top z, dip angle θ, extension in depth L, strike length $2Y$, and amplitude coefficient A) of a model in the space of logarithms of these parameters ($\log(z)$, $\log(\theta)$, $\log(L)$, $\log(Y)$, and $\log(|A|)$). The developed method has been successfully verified on synthetic examples without noise. The method is found stable and can estimate the inverse parameters of the buried target with acceptable accuracy when applied to data contaminated with various noise levels. However, some of the inverse parameters encountered some inaccuracy when the method was applied to synthetic data distorted by significant neighboring gravity effects/interferences. The validity of this method for practical applications has been successfully illustrated on two field examples with diverse geologic settings from mineral exploration. The estimated inverse parameters of the real data investigated are found to generally conform well with those yielded from drilling. The method is shown to be highly applicable for mineral prospecting and reconnaissance studies. It is capable of extracting the various characteristic inverse parameters that are of geologic and economic significance, and is of particular value in cases where the residual gravity data set is due to an isolated thinsheet type buried target. The sensitivity analysis carried out on the Jacobian matrices of the field examples investigated here has shown that the parameter that can be determined with the superior accuracy is θ (as confirmed from drilling information). The

parameters z, L, Y, and A can be estimated with acceptable accuracy, especially the parameters z and A. This inverse problem is non-unique. The non-uniqueness analysis and the tabulated inverse results presented here have shown that the parameters most affected by the non-uniqueness are L and Y. It has also been shown that the new scheme developed here is advantageous in terms of computational efficiency, stability and convergence than the existing gravity data inversion schemes that solve for the characteristic inverse parameters of a sheet/dike.

Keywords: Regularized 2.5D residual gravity data inversion; 3D thin-sheet inversion; Log-space inversion; Non-uniqueness analysis; Convergence analysis; Sensitivity analysis.

315. Tracing of Paleo-Shear Zones by Self-Potential Data Inversion: Case Studies from the KTB, Rittsteig, and Grossensees Graphite-Bearing Fault Planes

Salah A Mehanee

This paper describes a new method for tracing paleo-shear zones of the continental crust by self-potential (SP) data inversion. The method falls within the deterministic inversion framework, and it is exclusively applicable for the interpretation of the SP anomalies measured along a profile over sheet-type structures such as conductive thin films of interconnected graphite precipitations formed on shear planes. The inverse method fits a residual SP anomaly by a single thin sheet and recovers the characteristic parameters (depth to the top h, extension in depth a, amplitude coefficient k, and amount and direction of dip θ) of the sheet. This method minimizes an objective functional in the space of the logarithmed and non-logarithmed model parameters ($\log(h)$, $\log(a)$, $\log(k)$, and θ) successively by the steepest descent (SD) and Gauss-Newton (GN) techniques in order to essentially maintain the stability and convergence of this inverse method. Prior to applying the method to real data, its accuracy, convergence, and stability are successfully verified on numerical examples with and without noise. The method is then applied to SP profiles from the German Continental Deep Drilling Program (Kontinentales Tiefbohrprogramm der Bundesrepublik Deutschla-KTB), Rittsteig, and Grossensees sites in Germany for tracing paleo-shear planes coated with graphitic deposits. The comparisons of geologic sections constructed in this paper (based on the proposed deterministic approach) against the existing published interpretations (obtained based on trial-and-errormodeling) for the SP data of the KTB and Rittsteig sites have revealed that the deterministic approach suggests some new details that are of some geological significance. The findings of the proposed inverse scheme are supported by available drilling and other geophysical data. Furthermore, the real SP data of the Grossensees site have been interpreted (apparently for the first time ever) by the deterministic inverse scheme from which interpretive geologic cross sections are suggested. The computational efficiency, analysis of the numerical examples investigated, and comparisons of the real data inverted here have demonstrated that the developed deterministic approach is advantageous to the existing interpretationmethods, and it is suitable for meaningful interpretation of SP data acquired elsewhere over graphitic occurrences on fault planes.

Keywords: Self-potential regularized inversion; Mixed log-space-linear-space inversion; KTB, rittsteig, and grossensees

paleo-shear planes; Graphite-bearing fault planes; Thin sheet-like model; Steepest descent method; Gauss-newton method.

316. A Numerical Technique for an Accurate Determination of Formation Resistivity Factor Using F_R-R_O Overlays Method

Walid M. Mabrouk and Khaled S. Soliman

The exactness of water saturation value for given reservoir conditions depends on the accuracy of Archie parameters a, m, and n. The terms of Archie relationship have been subjected to many laboratory investigations and even more speculation. There are many factors that affect porosity exponent m, saturation exponent n, and tortuosity factor a. Usually, assumptions are made to approximate a and m; often m is 2, while a may be 0.81 or 1.0 depending on the type of lithology. But it is very difficult to fix Archie parameters regardless of reservoir characteristics; rock wettability, formation water salinity, permeability, porosity, and fluids distribution. This work illustrates a simple numerical method to calculate a and m which depends on FR-RO overlays method which is used as hydrocarbon indicator. The method is tested using synthetic and real data to ensure its ability in determining formation factor parameters a and m.
Keywords: Formation resistivity factor; *a* and *m*; Tortuosity and porosity exponent.

Dept. of Mathematics

317. Phenomenological Aspects of A TeV-scale Alternative Left-right Model

M. Ashry and S. Khalil

We revisit the alternative left-right symmetric model, motivated by the superstring-inspired E6 model.
We systematically analyze the constraints imposed by theoretical and experimental bounds on the parameter space of this class of models.We perform a comprehensive analysis of the Higgs sector and show that three neutral CP-even and two CP-odd Higgs bosons in addition to two charged Higgs bosons can be light, of O (100) GeV. We emphasize that the predictions of this model for the signal strengths of Higgs decays are consistent with the standard model expectations. We also explore discovery signatures of the exotic down-type quark, which is one of the salient predictions of this model.
Keywords: Left-right symmetry; B-L; Neutrino mass; Alternative left-right; Tree-level flavor-changing neutral current; Higgs; Exotic quarks.

318. Z'-Induced Invisible Right-Handed Sneutrino Decays at the LHC

W. Abdallah, J. Fiaschi, S. Khalil and S. Moretti

The invisible signals of right-handed sneutrino decays originating from a Z' are analyzed at the Large Hadron Collider. The possibility of accessing these events helps disentangling the B - L

extension of the minimal supersymmetric standard model from more popular scenarios of supersymmetry. We assess the scope of the CERN machine in establishing the aforementioned signatures when accompanied by monojet, single-photon or Z-radiation probes through sophisticated signal-to-background simulations carried out in the presence of parton shower, hadronization as well as detector effects. We find substantial sensitivity to all such signals for standard luminosities at Run 2.
Keywords: Right-handed sneutrino; Minimal supersymmetric standard model.

319. Double Higgs Peak in the Minimal SUSY B-L Model

W. Abdallah, S. Khalil and S. Moretti

Motivated by a ~3s excess recorded by the CMS experiment at the LHC around a mass of order ~137 GeV in ZZ → 4l and γγ samples, we analyze the discovery potential of a second neutral Higgs boson in the Supersymmetric B - L extension of the Standard Model at the CERN machine. We confirm that a double Higgs peak structure can be generated in this framework, with CP-even Higgs boson masses at ~125 GeV and ~137 GeV, unlike the case of the Minimal Supersymmetric Standard Model.
Keywords: Supersymmetric B-L model; Double higgs peak.

320. New Algorithms for Solving Third- and Fifth-Order Two Point Boundary Value Problems Based on Nonsymmetric Generalized Jacobi Petrov–Galerkin Method

E.H. Doha, W.M. Abd-Elhameed and Y.H. Youssri

Two families of certain nonsymmetric generalized Jacobi polynomials with negative integer indexes are employed for solving third- and fifth-order two point boundary value problems governed by homogeneous and nonhomogeneous boundary conditions using a dual Petrov–Galerkin method. The idea behind our method is to use trial functions satisfying the underlying boundary conditions of the differential equations and the test functions satisfying the dual boundary conditions. The resulting linear systems from the application of our method are specially structured and they can be efficiently inverted. The use of generalized Jacobi polynomials simplify the theoretical and numerical analysis of the method and also leads to accurate and efficient numerical algorithms. The presented numerical results indicate that the proposed numerical algorithms are reliable and very efficient.
Keywords: Dual-petrov–galerkin method; Generalized jacobi polynomials; Nonhomogeneous dirichlet conditions; Convergence analysis.

321. On Shallow Water Waves in A Medium With Time-Dependent Dispersion and Nonlinearity Coefficients

Hamdy I. Abdel-Gawad and Mohamed Osman

In this paper, we studied the progression of shallow water waves relevant to the variable coefficient Korteweg–de Vries (vcKdV) equation. We investigated two kinds of cases: when the dispersion and nonlinearity coefficients are proportional, and when they are not linearly dependent. In the first case, it was shown that the progressive waves have some geometric structures as in the case of KdV equation with constant coefficients but the waves travel with time dependent speed. In the second case, the wave structure is maintained when the nonlinearity balances the dispersion. Otherwise, water waves collapse. The objectives of the study are to find a wide class of exact solutions by using the extended unified method and to present a new algorithm for treating the coupled nonlinear PDE's.
Keywords: Variable coefficient; The extended unified method; Solitary and periodic wave solutions; Jacobi doubly periodic wave solutions; Time-dependent coefficients.

322. Legendre Spectral-Collocation Method for Solving Some Types of Fractional Optimal Control Problems

Nasser H. Sweilam and Tamer M. Al-Ajami

In this paper, the Legendre spectral-collocation method was applied to obtain approximate solutions for some types of fractional optimal control problems (FOCPs). The fractional derivative was described in the Caputo sense. Two different approaches were presented, in the first approach, necessary optimality conditions in terms of the associated Hamiltonian were approximated. In the second approach, the state equation was discretized first using the trapezoidal rule for the numerical integration followed by the Rayleigh–Ritz method to evaluate both the state and control variables. Illustrative examples were included to demonstrate the validity and applicability of the proposed techniq
Keywords: Legendre spectral-collocation method; Fractional order differential equations; Pontryagin'S maximum principle; Necessary optimality conditions; Rayleigh–ritz method.

323. Rad-Projective δ -Cover

Yasser Ibrahim and Mohamed Yousif

In generalizing the well-established notion of projective cover, the notions of D3-cover and rad-projective cover were recently introduced and new characterizations of perfect and semiperfect rings were provided. On the other hand, Y. Zhou introduced and studied the notions of d-cover, d-perfect and d-semiperfect rings. In this paper we combine and generalize these notions and introduce the new notions of rad-projective d-cover and D3-d-cover. New characterizations of d-perfect and d- semiperfect rings are provided.
Keywords: Injective and projective modules; Soc-injective and rad-projective modules; Perfect and semiperfect rings.

324. A Spectral Tau Algorithm Based on Jacobi Operational Matrix for Numerical Solution of Time Fractional Diffusion-Wave Equations

A.H. Bhrawy, E.H. Doha, D. Baleanud and S.S. Ezz-Eldien

In this paper, an efficient and accurate spectral numerical method is presented for solving second-, fourth-order fractional diffusion-wave equations and fractional wave equations with damping. The proposed method is based on Jacobi tau spectral procedure together with the Jacobi operational matrix for fractional integrals, described in the Riemann– Liouville sense. The main characteristic behind this approach is to reduce such problems to those of solving systems of algebraic equations in the unknown expansion coefficients of the sought-for spectral approximations. The validity and effectiveness of the method are demonstrated by solving five numerical examples. Numerical examples are presented in the form of tables and graphs to make comparisons with the results obtained by other methods and with the exact solutions more easier
Keywords: Fractional diffusion-wave equations; Tau method Shifted jacobi polynomials; Operational matrix Caputo derivative.

325. An Efficient Collocation Algorithm for Multidimensional Wave Type Equations with Nonlocal Conservation Conditions

A.H. Bhrawy, E.H. Doha, M.A. Abdelkawy and R.M. Hafez

In this paper, we derive and analyze an efficient spectral collocation algorithm to solve numerically some wave equations subject to initial-boundary nonlocal conservation conditions in one and two space dimensions. The Legendre pseudospectral approximation is investigated for spatial approximation of the wave equations. The Legendre–Gauss– Lobatto quadrature rule is established to treat the nonlocal conservation conditions, and then the problem with its nonlocal conservation conditions are reduced to a system of ODEs in time. As a theoretical result, we study the convergence of the solution for the one-dimensional case. In addition, the proposed method is extended successfully to the two-dimensional case. Several numerical examples with comparisons are given. The computational results indicate that the proposed method is more accurate than finite difference method, the method of lines and spline collocation approach.
Keywords: Nonlocal boundary conditions; Nonclassic boundary value problems; Integral conservation condition; Neumann boundary condition; Collocation method; Legendre-gauss- lobatto quadrature.

326. A Quantitative Model of the Major Pathways for Radiation-Induced DNA Double-Strand Break Repair

Oleg V.Belov, Eugene A. Krasavin, Marina S. Lyashko, Munkhbaatar Batmunkh and Nasser H. Sweilam

We have developed a model approach to simulate the major pathways of DNA double-strand break (DSB) repair in mammalian and human cells. The proposed model shows a

possible mechanistic explanation of the basic regularities of DSB processing through the non-homologous end-joining (NHEJ), homologous recombination (HR), single-strand annealing (SSA) and two alternative end-joining pathways. It reconstructs the time-courses of radiation-induced foci specific to particular repair processes including the major intermediate stages. The model is validated for ionizing radiations of a wide range of linear energy transfer (0.2–236 keV/µm) including a relatively broad spectrum of heavy ions. The appropriate set of reaction rate constants was suggested to satisfy the kinetics of DSB rejoining for the considered types of exposure. The simultaneous assessment of several repair pathways allows to describe their possible biological relations in response to irradiation. With the help of the proposed approach, we reproduce several experimental data sets on γ -H2AX foci remaining in different types of cells including those defective in NHEJ, HR, or SSA functions. The results produced confirm the hypothesis suggesting existence of at least two alternative Ku-independent end-joining pathways

Keywords: DNA double-strand break repair; Ionizing radiation; Mathematical modeling.

327. An Accurate Numerical Technique for Solving Fractional Optimal Control Problems

A.H. Bhrawy, E.H. Doha, D. Baleanu , S.S. Ezz-Eldien and M.A. Abdelkawy

In this article, we propose the shifted Legendre orthonormal polynomials for the numerical solution of the fractional optimal control problems that appear in several branches of physics and engineering. The Rayleigh-Ritz method for the necessary conditions of optimization and the operational matrix of fractional derivatives are used together with the help of the properties of the shifted Legendre orthonormal polynomials to reduce the fractional optimal control problem to solving a system of algebraic equations that greatly simplifies the problem. For confirming the efficiency and accuracy of the proposed technique, an illustrative numerical example is introduced with its approximate solution.

Keywords: Fractional optimal control problem; Legendre polynomials; Operational matrix; Rayleigh-ritz method; Caputo derivatives.

328. An Efficient Numerical Scheme for Solving Multi-Dimensional Fractional Optimal Control Problems With A Quadratic Performance Index

A. H. Bhrawy, E. H. Doha, J. A. Tenreiro Machado and S. S. Ezz-Eldien

The shifted Legendre orthogonal polynomials are used for the numerical solution of a new formulation for the multi-dimensional fractional optimal control problem (M-DFOCP) with a quadratic performance index. The fractional derivatives are described in the Caputo sense. The Lagrange multiplier method for the constrained extremum and the operational matrix of fractional integrals are used together with the help of the properties of the shifted Legendre orthonormal polynomials. The

method reduces the M-DFOCP to a simpler problem that consists of solving a system of algebraic equations. For confirming the efficiency and accuracy of the proposed scheme, some test problems are implemented with their approximate solutions.

Keywords: Fractional optimal control problem; Legendre polynomials; Operational matrix; Lagrange multiplier method; Caputo derivatives; Riemann-liouville integrals.

329. Semigroups of Operators and Abstract Dynamic Equations on Time Scales

Alaa E. Hamza and Karima M.Oraby

In this paper we develop the theory of strongly continuous semigroups (C0-semigroups) of bounded linear operators from a Banach space X into itself. Many properties of a C0-semigroup $\{T(t):t \in T\}$ and its generator A are established. Here $T \subseteq R^{\geq 0}$ is a time scale endowed with an additive semigroup structure. We also establish necessary and sufficient conditions for the dynamic initial value problem View the MathML source to have a unique solution, where D(A) is the domain of A. Finally, we unify the continuous Hille–Yosida–Phillips Theorem and the discrete Gibson Theorem.

Keywords: Semigroups of operators; Generators and dynamic equations on time scales.

330. Second Kind Shifted Chebyshev Polynomials for Solving Space Fractional Order Diffusion Equation

N.H. Sweilam, A.M. Nagy and Adel A. El-Sayed

In this paper, an efficient numerical method for solving space fractional order diffusion equation is presented. The numerical approach is based on shifted Chebyshev polynomials of the second kind where the fractional derivatives are expressed in terms of Caputo type. Space fractional order diffusion equation is reduced to a system of ordinary differential equations using the properties of shifted Chebyshev polynomials of the second kind together with Chebyshev collocation method. The finite difference method is used to solve this system of equations. Several numerical examples are provided to confirm the reliability and effectiveness of the proposed method.

Keywords: Numerical solution of the fractional order diffusion equation; Shifted chebyshev polynomials of the second kind; The finite difference method.

331. New Galerkin Operational Matrix of Derivatives for Solving Lane-Emden Singular-Type Equations

W.M. Abd-Elhameed

A new operational matrix of derivatives of certain nonsymmetric generalized Jacobi polynomials is established and employed for the sake of obtaining new algorithms for handling linear and nonlinear Lane-Emden singular-type IVPs. The suggested

algorithms are built on utilizing the Galerkin and collocation spectral methods. The principle idea behind these algorithms is based on converting the problems governed by their initial conditions into systems of linear or nonlinear algebraic equations which can be efficiently solved by suitable solvers. The numerical algorithms are supported by a careful investigation of the convergence analysis of the suggested nonsymmetric generalized Jacobi expansion. Some illustrative examples are given for the sake of indicating the high accuracy and efficiency of the two proposed algorithms.
Keywords: Spectral methods; Lane-emden equation.

332. Multi-Wave Solutions of the (2+1)-Dimensional Nizhnik-Novikov-Veselov Equations with Variable Coefficients

M.S. Osman and H.I. Abdel-Gawad

The European Physical Journal Plus, 130: 1-11 (2015) IF: 1.377

In this paper, we present a generalized unified method for finding multi-wave solutions of nonlinear evolution equations via the (2+1)-dimensional Nizhnik-Novikov-Veselov equations with variable coefficients (vary with time). Multi-auxiliary equations have been introduced in this method to obtain not only multi-soliton solutions but also multi-periodic or multi-elliptic solutions. Compared with the Hirota's method and the inverse scattering method, the proposed method gives more general exact multi-wave solutions without much extra effort. To give more physical insight to the obtained solutions, we present graphically their representative structures by setting the arbitrary functions in the solutions as specific functions. It is shown that rogue waves are generated in the solutions of the velocity components in an incompressible fluid which they are enveloped by the characteristic curves. Furthermore, we found multi-elliptic waves highly dispersed far from the core of waves.
Keywords: Generalized unified method; The (2+1)-dimensional nizhnik-novikov-veselov equations; Multi-wave solutions.

333. Deformation for A Rectangle by a Finite Fourier Transform

A. R. El Dhaba, M. S. Abou-Dina and A. F. Ghaleb

Journal of Computational And Theoretical Nanoscience, 12: 31-37 (2015) IF: 1.343

In this paper, we introduce a simple method to solve a static, plane boundary value problem in elasticity for an isotropic rectangular region. The method depends on finite Fourier transform to transfer the biharmonic equation to a nonhomogeneous ordinary differential equation of the fourth order. Also, by transfering the boundary conditions, one can find the general solution for the nonhomogeneous ordinary differential equation. Finally, the inverse Fourier transfer allows to get the analytical solution for the biharmonic equation. Using expressions for displacements proved by two of the authors [MSA and AFG], one can obtain the displacements for the rectangular domain.
Keywords: Elasticity; Finite fourier transform; Plane boundary value problem; Rectangle; Statics.

334. Numerical Treatment of A Problem of Plane, Uncoupled Linear Thermo-Elasticity for A Square Cylinder by A Boundary Integral Method

A. R. El Dhaba, M. S. Abou-Dina and A. F. Ghaleb

Journal of Computational And Theoretical Nanoscience, 12: 501-515 (2015) IF: 1.343

A boundary integral method is used to obtain the numerical solution of a problem of thermoelasticity for a long cylinder with square cross-section subject to an external pressure and a heat source inside the cylinder. An ambient temperature and a Robin radiation condition are considered. The corners are smoothened suitably. Quantities of practical interest are calculated on the boundary. The results are discussed and figures are provided.
Keywords: Boundary integral method; Numerical approach; Plane boundary value problem; Square; Statics; Thermoelasticity.

335. Numerical Solution to A Nonlinear, One-Dimensional Problem of Anisotropic Thermoelasticity With Volume Force and Heat Supply in A Half-Space: Interaction of Displacements

W. Mahmoud, A. F. Ghaleb, E. K. Rawy, H. A. Z. Hassan and A. A. Mosharafa

Archive of Applied Mechanics, 85: 433-454 (2015) IF: 1.114

A numerical solution is presented for a one-dimensional, coupled nonlinear wave propagation problem of thermoelasticity for an anisotropic, elastic half-space involving body force and heat supply, under a periodic in-depth displacement at the boundary. This is a generalization of a previous work by the same authors with only the in-depth displacement. The volume force and bulk heating simulate the effect of a beam of particles infiltrating the medium. No phase transition is considered, and the domain of the solution excludes any shock wave formation at breaking distance. Three interacting components of the mechanical displacement are taken into account. The numerical scheme is investigated rigorously. It is shown to exhibit unconditional stability and a correct reproduction of the process of coupled thermo-mechanical wave propagation and the coupling between the displacement components. The interplay between these two factors and the applied boundary disturbance is outlined. The results are discussed and compared with those when only the in-depth displacement is considered. The presented figures show the effects of volume force and heat supply on the distributions of the mechanical displacements and temperature inside the medium. The presence of more than one velocity of propagation of the waves due to anisotropy is put in evidence. It turns out that the effect of the transversal displacements on the in-depth displacement and on the temperature for the considered values of the different material constants becomes weaker as time grows. The different forms of the propagating waves allow, if proper measurements are carried out, to detect the presence of a force field or bulk heating in the medium.
Keywords: Nonlinear thermoelasticity; Anisotropy; Nonlinear wave propagation; Volume force; Heat.

336. An Efficient Legendre Spectral Tau Matrix Formulation for Solving Fractional Subdiffusion and Reaction Subdiffusion Equations

E. H. Doha, A. H. Bhrawy and S. S. Ezz-Eldien

In this work, we discuss an operational matrix approach for introducing an approximate solution of the fractional subdiffusion equation (FSDE) with both Dirichlet boundary conditions (DBCs) and Neumann boundary conditions (NBCs). We propose a spectral method in both temporal and spatial discretizations for this equation. Our approach is based on the space-time shifted Legendre tau-spectral method combined with the operational matrix of fractional integrals, described in the Riemann–Liouville sense.

The main characteristic behind this approach is to reduce such problems to those of solving systems of algebraic equations in the unknown expansion coefficients of the sought-for spectral approximations. In addition, this approach is also investigated for solving the FSDE with the variable coefficients and the fractional reaction subdiffusion equation (FRSDE). For conforming the validity and accuracy of the numerical scheme proposed, four numerical examples with their approximate solutions are presented. Also, comparisons between our numerical results and those obtained by compact finite difference method (CFDM), Box-type scheme (B-TS), and FDM with Fourier analysis (FA) are introduced.

Keywords: Legendre polynomials; Tau method.

337. An Accurate Jacobi Pseudospectral Algorithm for Parabolic Partial Differential Equations with Nonlocal Boundary Conditions

E. H. Doha, A. H. Bhrawy and M. A. Abdelkawy

A new spectral Jacobi–Gauss–Lobatto collocation (J–GL–C) method is developed and analyzed to solve numerically parabolic partial differential equations (PPDEs) subject to initial and nonlocal boundary conditions.

The method depends basically on the fact that an expansion in a series of Jacobi polynomials $J_n^{(\theta,\vartheta)}(x)$ is assumed, for the function and its space derivatives occurring in the partial differential equation (PDE), the expansion coefficients are then determined by reducing the PDE with its boundary conditions into a system of ordinary differential equations (SODEs) for these coefficients. This system may be solved numerically in a step-by-step manner by using implicit the Runge–Kutta (IRK) method of order four. The proposed method, in contrast to common finite-difference and finite-element methods, has the exponential rate of convergence for the spatial discretizations. Numerical results indicating the high accuracy and effectiveness of this algorithm are presented.

Keywords: Boundary-value problems; Errors; Polynomials; Algorithms; Partial differential equations.

338. On Weierstrass Points of A Family of Quartic Curves

Saleem Mohammed and Badr Eslam

The aim of this paper is to investigate properties of the Weierstrass points on the family of compact Riemann surfaces $C_{a,b,c}: X^4 + Y^4 + Z^4 + aX^2Y^2 + bX^2Z^2 + cY^2Z^2 = 0$, where a, b and c are parameters such that $a^2, b^2, c^2 \neq = 1,4$ and $a^2 + b^2 + c^2 - abc - 4 \neq 0$, by using finite group actions on this family. Furthermore, the geometry of these points is discussed.

Keywords: Weierstrass points; Group action; Flex points.

339. A Jacobi Spectral Collocation Scheme Based on Operational Matrix for Time-fractional Modified Korteweg-de Vries Equations

A. H. Bhrawy, E. H. Doha, S. S. Ezz-Eldien and M. A. Abdelkawy

In this paper, a high accurate numerical approach is investigated for solving the time-fractional linear and nonlinear Korteweg-de Vries (KdV) equations. These equations are the most appropriate and desirable definition for physical modeling. The spectral collocation method and the operational matrix of fractional derivatives are used together with the help of the Gauss-quadrature formula in order to reduce such problem into a problem consists of solving a system of algebraic equations which greatly simplifying the problem. Our approach is based on the shifted Jacobi polynomials and the fractional derivative is described in the sense of Caputo. In addition, the presented approach is applied also to solve the timefractional modified KdV equation. For testing the accuracy, validity and applicability of the developed numerical approach, we apply it to provide high accurate approximate solutions for four test problems.

Keywords: KdV equation; Jacobi polynomials; Operational matrix; Gauss quadrature; Collocation spectral method; Caputo derivative,

340. New Spectral Solutions of Multi-term Fractional-Order Initial Value Problemswith Error Analysis

W. M. Abd- Elhameed and Y. H. Youssri

In this paper, a new spectral algorithm for solving linear and nonlinear fractional-order initial value problems is established. The key idea for obtaining the suggested spectral numerical solutions for these equations is actually based on utilizing the ultraspherical wavelets along with applying the collocation method to reduce the fractional differential equation with its initial conditions into a system of linear or nonlinear algebraic equations in the unknown expansion coefficients. The convergence and error analysis of the suggested ultraspherical wavelets expansion are carefully discussed. For the sake of testing

the proposed algorithm, some numerical examples are considered. The numerical results indicate that the resulting approximate solutions are close to the analytical solutions and they are more accurate than those obtained by some other existing techniques in literature.

Keywords: Wavelets; Ultraspherical polynomials; Collocation method; Fractionalorder differential equations.

341. Thermal Stresses Induced by A Variable Heat Source in A Rectangle and Variable Pressure at its Boundary by Finite Fourier Transform

A. R. El Dhaba and M. S. Abou-Dina

Journal of Thermal Stresses, 38: 677-700 (2015) IF: 0.992

This paper deals with the two-dimensional, non-homogeneous boundary value problem for static, isotropic and thermoelastic material occupying an infinitely long cylinder with a rectangular cross-section. The cylinder is surrounded by a given temperature and subjected to variable pressures at its boundaries. We deal with static, uncoupled, linear thermoelasticity. The equations of heat conduction and mechanical problem are considered separately. The technique of the finite Fourier transform is used for the solution. The thermoelastic behavior, due to an internal heat generation within the domain, is discussed. The results for displacement and stresses have been computed from the Airy stress function and are illustrated graphically.

Keywords: Analytical methods; Elastic rectangular cylinder; Finite fourier transform; Plane problem; Thermoelasticity.

342. On Using Third and Fourth Kinds Chebyshev Operational Matrices for Solving Lane-emden Type Equations

E.H. Doha, W.M. Abd-Elhameed and M.A. Bassuony

Romanian Journal of Physics, 60: (2015) IF: 0.924

This paper is concerned with deriving two new operational matrices of derivatives for Chebyshev polynomials of third and fourth kinds. As an important application of these introduced operational matrices, a certain class of linear and nonlinear Lane-Emden type singular initial value problems (IVPs) are treated. Two numerical algorithms are described in detail for solving such kinds of problems. The idea of obtaining our algorithms is essentially based on converting the differential equation with its initial conditions to a system of linear or nonlinear algebraic equations. Numerical examples concern some relevant physical problems are included to demonstrate the validity and applicability of the proposed algorithms. In addition, some comparisons with some other methods are made.

Keywords: Lane-emden equations; Operational matrices of differentiation; Third and fourth kinds chebyshev polynomials.

343. Ultraspherical Wavelets Method for Solving Lane-emden Type Equations

Y. H. Youssri, W. M. Abd-Elhameed and E. H. Doha

Romanian Journal of Physics, 60: (2015) IF: 0.924

In this paper, a new shifted ultraspherical wavelets operational matrix of derivatives is introduced. The two wavelets operational matrices, namely Legendre and first kind Chebyshev operational matrices can be deduced as two special cases. Two numerical algorithms based on employing the shifted ultraspherical wavelets operational matrix of derivatives for solving linear and nonlinear differential equations of Lane-Emden type are developed. The main idea for obtaining the presented algorithm is essentially based on reducing the linear or nonlinear equations with their initial conditions to systems of linear or nonlinear algebraic equations, which can be efficiently solved. Some numerical examples are given to demonstrate the validity and the applicability of the algorithms.

Keywords: Lane-emden equations; Ultraspherical polynomials; Wavelets; Operational matrix; Spectral methods; Collocation methods.

344. A Highly Accurate Jacobi Collocation Algorithm for Systems of High-order Linear Differential–difference Equations With Mixed Initial Conditions

A. H. Bhrawy, E. H. Doha, D. Baleanu and R. M. Hafez

Mathematical Methods in the Applied Science, 2015: (2015) IF: 0.918

In this paper, a shifted Jacobi–Gauss collocation spectral algorithm is developed for solving numerically systems of highorder linear retarded and advanced differential–difference equations with variable coefficients subject to mixed initial conditions. The spatial collocation approximation is based upon the use of shifted Jacobi–Gauss interpolation nodes as collocation nodes. The system of differential–difference equations is reduced to a system of algebraic equations in the unknown expansion coefficients of the sought-for spectral approximations. The convergence is discussed graphically. The proposed method has an exponential convergence rate. The validity and effectiveness of the method are demonstrated by solving several numerical examples. Numerical examples are presented in the form of tables and graphs tomake comparisons with the results obtained by other methods and with the exact solutions more easier.

Keywords: System of differential-difference equations; Collocation method; Jacobi–Gauss quadrature; Shifted Jacobi polynomials.

345. Some Inequalities Based on a General Quantum Difference Operator

Alaa E Hamza and Enas M Shehata

Journal of Inequalities and Applications, 2015: 1-12 (2015) IF: 0.773

In this paper, some integral inequalities based on the general quantum difference operator D_β are deduced. Here, D_β is defined by $D_\beta f(t) = (f(\beta(t))–f(t))/(\beta(t)–t)$, where β is a strictly increasing continuous function, defined on an interval $I \subseteq R$, that has one fixed point $s_0 \in I$. The β-Hβ Hölder and β-Minkowski inequalities are proved. Also, the β-Gronwall, β-Bernoulli, and some related inequalities are shown. Finally, the β-Lyapunov inequality is established.

Keywords: Quantum difference operator; Quantum calculus; Hölder inequality; Minkowski inequality; Gronwall inequality; Bernoulli inequality; Lyapunov inequality.

346. On the Coefficients of Differentiated Expansions and Derivatives of Chebyshev Polynomials of the Third and Fourth Kinds

Eid H. Doha, Waleed M. Abd-Elhameed and Mahmoud A. Bassuony

Acta Mathematica Scientia, 35 (2015) IF: 0.742

Two new analytical formulae expressing explicitly the derivatives of Chebyshev polynomials of the third and fourth kinds of any degree and of any order in terms of Cheby- shev polynomials of the third and fourth kinds themselves are proved. Two other explicit formulae which express the third and fourth kinds Chebyshev expansion coefficients of a general-order derivative of an infinitely differentiable function in terms of their original ex- pansion coefficients are also given. Two new reduction formulae for summing some termi- nating hypergeometric functions of unit argument are deduced. As an application of how to use Chebyshev polynomials of the third and fourth kinds for solving high-order boundary value problems, two spectral Galerkin numerical solutions of a special linear twelfth-order boundary value problem are given.

Keywords: Chebyshev Polynomials of the third and fourth kinds; Expansion coefficients; Generalized hypergeometric functions; Boundary value problems.

347. New Product and Linearization Formulae of Jacobi Polynomials of Certain Parameters

W.M. Abd-Elhameed

Integral Transforms and Special Functions, 26(8) (2015) IF: 0.723

In this research article, a new product formula of Jacobi polynomials of certain parameters is established. This formula is expressed in terms of a terminating hypergeometric function of the type 6F5(1) and it generalizes a formula which connects explicitly the squares of two ultraspherical polynomials with different parameters. Thanks to symbolic algebraic computation, and in particular, the celebrated algorithms of Zeilberger and Petkovsek-van Hoeij, several reduction formulae for summing certain terminating hypergeometric functions of unit argument are given, and hence some new product and linearization formulae of Jacobi polynomials of certain parameters are deduced. The latter formulae are used to obtain new formulae for some definite integrals.

Keywords: Linearization problems; Jacobi polynomials; Generalized hypergeometric functions; Symbolic algorithms.

348. An Efficient Numerical Scheme Based on the Shifted Orthonormal Jacobi Polynomials for Solving Fractional Optimal Control Problems

Eid H Doha, Ali H Bhrawy, Dumitru Baleanu, Samer S Ezz-Eldien and Ramy M Hafez

Advances in Difference Equations, 2015: (2015) IF: 0.64

In this article, we introduce a numerical technique for solving a general form of the fractional optimal control problem. Fractional derivatives are described in the Caputo sense.

Using the properties of the shifted Jacobi orthonormal polynomials together with the operational matrix of fractional integrals (described in the Riemann-Liouville sense), we transform the fractional optimal control problem into an equivalent variational problem that can be reduced to a problem consisting of solving a system of algebraic equations by using the Legendre-Gauss quadrature formula with the Rayleigh-Ritz method.

This system can be solved by any standard iteration method. For confirming the efficiency and accuracy of the proposed scheme, we introduce some numerical examples with their approximate solutions and compare our results with those achieved using other methods.

Keywords: Fractional optimal control problem; Jacobi polynomials; Operational matrix; Gauss quadrature; Rayleigh-ritz method.

349. New Formulas for the Linearization Coefficients of Some Nonsymmetric Jacobi Polynomials

Waleed M Abd-Elhameed

Advances in Difference Equations, 2015: (2015) IF: 0.64

The main aim of this paper is to develop four innovative linearization formulas for some nonsymmetric Jacobi polynomials.

This means that we find the coefficients of the products of Jacobi polynomials of certain parameters. In general, these coefficients are expressed in terms of certain hypergeometric functions of the unit argument. We employ some symbolic algebraic computations such as the algorithms of Zeilberger, Petkovsek and van Hoeij for reducing such coefficients.

Moreover, and based on a certain Whipple transformation, two new closed formulas for summing certain terminating hypergeometric functions of the unit argument are deduced. New formulas for some definite integrals are given with the aid of the derived linearization formulas

Keywords: Linearization coefficients; Hypergeometric functions; Jacobi polynomials; Symbolic computation; Recurrence relations.

350. A General Quantum Difference Calculus

Alaa E Hamza, Abdel-Shakoor M Sarhan, Enas M Shehata and Khaled A Aldwoah

Advances in Difference Equations, 2015: 1-19 (2015) IF: 0.64

In this paper, we consider a strictly increasing continuous function β, and we present a general quantum difference operator $D\beta$ which is defined to be $D\beta f(t) = (f(\beta(t)) - f(t))/(\beta(t) - t)$. This operator yields the Hahn difference operator when $\beta(t) = qt + \omega$, the Jackson q-difference operator when $\beta(t) = qt$, $q \in (0, 1)$, $\omega > 0$ are fixed real numbers and the forward difference operator when $\beta(t) = t + \omega$, $\omega > 0$. A calculus based on the operator $D\beta$ and its inverse is established.

Keywords: Quantum difference operator; Quantum calculus; Hahn difference operator; Jackson Q-difference operator.

351. C3-Modules

Ismail Amin Yasser Ibrahim and Mohamed Yousif

Algebra Colloquium, 22: 655-670 (2015) IF: 0.298

One of the continuity conditions identifed by Utumi on self injective rings is the C3-condition, where a module M is called a C3-module if whenever A and B are direct summands of M and $A \cap B = 0$, then $A \odot B$ is a summand of M. In addition to injective and direct-injective modules, the class of C3-modules includes the semisimple, continuous, indecomposable and regular modules. Indeed, every commutative ring is a C3-ring. In this paper we provide a general and unified treatment of the above mentioned classes of modules in terms of the C3-condition, and establish new characterizations of several well known classes of rings.

Keywords: Injective and quasi-injective modules; C2-modules and C3-modules.

352. Numerical Solution of Initial-Boundary System of Nonlinear Hyperbolic Equations

E. H. Doha, A. H. Bhrawy, M. A. Abdelkawy and R. M. Hafez

Indian Journal of Pure and Applied Mathematics, 46(5): (2015) IF: 0.224

In this article, we present a numerical approximation of the initial-boundary system of nonlinear hyperbolic equations based on spectral Jacobi-Gauss-Radau collocation (J-GR-C) method. A J-GR-C method in combination with the implicit Runge-Kutta scheme are employed to obtain a highly accurate approximation to the mentioned problem. J-GR-C method, based on Jacobi polynomials and Gauss-Radau quadrature integration, reduces solving the system of nonlinear hyperbolic equations to solve a system of nonlinear ordinary differential equations (SNODEs). In the examples given, numerical results by the J-GR-C method are compared with the exact solutions. In fact, by selecting relatively few J-GR-C points, we are able to get very accurate approximations. In this way, the results show that this method has a good accuracy and efficiency for solving coupled partial differential equations.

Keywords: System of nonlinear hyperbolic equations; Collocation method; Jacobi-gauss-radau quadrature; Implicit runge-kutta method.

353. on P-Supersolvability of Finite Groups

Mohamed Asaad

Studia Scientiarum Mathematicarum Hungarica, 52(4): 504-510 (2015) IF: 0.205

Let G be a finite group. A subgroup H of G is said to be s-permutable in G if H permutes with all Sylow subgroups of G. Let H be a subgroup of G and let HsG be the subgroup of H generated by all those subgroups of H which are s-permutable in G. A subgroup H of G is called n-embedded in G if G has a normal subgroup T such that HG = HT and H \ T 5 H$_s$G, where HG is the normal closure of H in G. We investigate the influence of n-embedded subgroups of the p-nilpotency and p-supersolvability of G.

Keywords: Finite group;N-embedded subgroup;S-permutable subgroup;C-normal subgroup;Supersolvable group;Saturated formation.

354. Leibniz'S Rule and Fubini'S Theorem Associated with Power Quantum Difference Operators

Alaa E. Hamza and M. H. Al-Ashwal

International Journal of Mathematical Analysis, 9: 2733-2747 (2015)

Jackson in 1908 introduced the well–known and the most used quantum difference operator $D_q f(t) = (f(qt) - f(t))/(qt - t)$ for a fixed $0 < q < 1$. Aldwoah in 2009 introduced the power quantum n, q– difference operator $D_{n,q}f(t) = (f(qt^n) - f(t))/(qt^n - t)$, where n is an odd natural number and $0 < q < 1$ is fixed. Dn,q yields Jackson q– difference operator, when $n = 1$. In this paper, we establish Leibniz's rule and Fubini's theorem associated with this power quantum difference operator.

Keywords: n; q-Power difference operator; n; q–integral; n; q–leibniz;S rule; n; q–fubini'S theorem.

355. Cluster Computing for the Large Scale Discrete Fractional Cable Equation

N.H. Sweilam, Hatem Moharram and N.K. Abdel Moniem

Egyptian Informatics Journal, 16: 37-44 (2015)

This paper presents a numerical simulation technique for the fractional Cable equation in large scale domain. Special attention is given to the parallel execution of the fractional weighted average finite difference method (FWA-FDM) on distributed system with explicit message passing, where the fractional derivative is defined in Riemann–Liouville sense. The resultant huge system of equations is studied using precondition conjugate gradient method (PCG), with the implementation of cluster computing on it. The proposed approach fulfills the suitability for the implementation on Linux PC cluster through the minimization of inter-process communication. To examine the efficiency and accuracy of the proposed method, numerical test experiments using different number of the Linux PC cluster nodes are studied. The performance metrics clearly show the benefit of using the proposed approach on the Linux PC cluster in terms of execution time reduction and speedup with respect to the sequential running in a single PC.

Keywords: Weighted average finite difference method; Fractional cable equation; Precondition conjugate gradient method (PCG); Parallel computations; Linux PC cluster workstation.

356. Non-Standard Crank-Nicholson Method for Solving the Variable Order Fractional Cable Equation

N. H. Sweilam and T. A. Assiri

Appl. Math. Inf. Sci. 9, (2), 943-951 (2015)

In this paper, a non-standard Crank-Nicholson finite difference method (NSCN) is presented. NSCN is used to study numerically

the variable-order fractional Cable equation, where the variable order fractional derivatives are described in the Riemann-Liouville and the Gr¨unwald-Letnikov sense. The stability analysis of the proposed methods is given by a recently proposed procedure similar to the standard John von Neumann stability analysis. The reliability and efficiency of the proposed approach are demonstratedby some numerical experiments. It is found that NSCN is preferable than the standard Crank-Nicholson finite difference method (SCN).
Keywords: Non-standard finite difference method; Crank-nicholson method; Variable order fractional cable equation; Von neumann stability analysis.

Dept. of Physics

357. Measurement of the Target-Normal Single-Spin Asymmetry in Quasielastic Scattering from the Reaction ^{3}He↑ (e,é)

Y.-W. Zhang, E. Long, M. Mihovilovi,G. Jin, K. Allada, B. Anderson, J. R. M. Annand, T. Averett, C. Ayerbe-Gayoso, W. Boeglin, P. Bradshaw, A. Camsonne, M. Canan, G. D. Cates, C. Chen, J. P. Chen, E. Chudakov, R. De Leo, X. Deng, A. Deur, C. Dutta, L. El Fassi, D. Flay, S. Frullani, F. Garibaldi, H. Gao, S. Gilad, R. Gilman, O. Glamazdin, S. Golge, J. Gomez, O. Hansen, D.W. Higinbotham,T. Holmstrom, J. Huang, H. Ibrahimg and et al.

We report the first measurement of the target-normal single-spin asymmetry in deep-inelastic scattering from the inclusive reaction ^{3}He↑ (e,é)on a polarized ^{3}He gas target. Assuming time-reversal invariance, this asymmetry is strictly zero in the Born approximation but can be nonzero if two-photon-exchange contributions are included. The experiment, conducted at Jefferson Lab using a 5.89 GeV electron beam, covers a range of 1.7.lt.W.lt.2.9GeV, 1.lt.Q^2.lt.4GeV^2 and 0.16.lt.x.lt.0.65. Neutron asymmetries were extracted using the effective nucleon polarization and measured proton-to-He3 cross-section ratios. The measured neutron asymmetries are negative with an average value of (-1.09±0.38)x10^-2 for invariant mass W.gt. 2 GeV, which is nonzero at the 2.89 sigma level. Our measured asymmetry agrees both in sign and magnitude with a two-photon-exchange model prediction that uses input from the Sivers transverse momentum distribution obtained from semi-inclusive deep-inelastic scattering.
Keywords: Electron nucleus; Deep inelastic scattering ; Helium; Nuclide;Polarized target;Spin; Asymmetry;Nucleon polarization; Asymmetry; Sivers function; Exchange; Two-Photon ; Photon; Coupling.

358. Study of Vector Boson Scattering and Search for New Physics in Events with two Same-Sign Leptons and Two Jets

Ali Yehia Ellithi Kamel et al

A study of vector boson scattering in pp collisions at a center-of-mass energy of 8 TeV is presented. The data sample corresponds to an integrated luminosity of 19.4fb-1 collected with the CMS detector. Candidate events are selected with exactly two leptons of the same charge, two jets with large rapidity separation and high dijet mass, and moderate missing transverse energy. The signal region is expected to be dominated by electroweak same-sign W-boson pair production. The observation agrees with the standard model prediction. The observed significance is 2.0 standard deviations, where a significance of 3.1 standard deviations is expected based on the standard model. Cross section measurements for W±W± and WZ processes in the fiducial region are reported. Bounds on the structure of quartic vector-boson interactions are given in the framework of dimension-eight effective field theory operators, as well as limits on the production of doubly charged Higgs bosons.
Keywords: Pp collision ; Vector bosons.

359. Search for Displaced Supersymmetry in Events with an Electron and A Muon with Large Impact Parameters

Ali Yehia Ellithi Kamel et al.

A search for new long-lived particles decaying to leptons is presented using proton-proton collisions produced by the LHC at $\sqrt{s}$ = 8TeV. Data used for the analysis were collected by the CMS detector and correspond to an integrated luminosity of 19.7fb^{-1}. Events are selected with an electron and muon with opposite charges that both have transverse impact parameter values between 0.02 and 2 cm. The search has been designed to be sensitive to a wide range of models with nonprompt e-μ final states. Limits are set on the "displaced supersymmetry" model, with pair production of top squarks decaying into an e-μ final state via R-parity-violating interactions. The results are the most restrictive to date on this model, with the most stringent limit being obtained for a top squark lifetime corresponding to cτ=2cm, excluding masses below 790 GeV at 95% confidence level.
Keywords: Pp; Collisionlong lived particles.

360. Search for Monotop Signatures in Proton-Proton Collisions At $\sqrt{s}$ =8TeV

Ali Yehia Ellithi Kamel et al.

Results are presented from a search for new decaying massive particles whose presence is inferred from an imbalance in transverse momentum and which are produced in association with a single top quark that decays into a bottom quark and two light quarks. The measurement is performed using 19.7 fb^{-1} of data from proton-proton collisions at a center-of-mass energy of 8 TeV, collected with the CMS detector at the CERN LHC. No deviations from the standard model predictions are observed and lower limits are set on the masses of new invisible bosons. In particular, scalar and vector particles, with masses below 330 and 650 GeV, respectively, are excluded at 95% confidence level, thereby substantially extending a previous limit published by the CDF Collaboration.
Keywords: Pp collision; Decay of top quarks.

Basic Science Sector

361. Combined Measurement of the Higgs Boson Mass in Pp Collisions at $\sqrt{s}$ =7 and 8 TeV with the ATLAS and CMS Experiments

Ali Yehia Ellithi Kamel et al

Physical Review Letters, 114: 191803-0 (2015) IF: 7.512

A measurement of the Higgs boson mass is presented based on the combined data samples of the ATLAS and CMS experiments at the CERN LHC in the H $\rightarrow \gamma\gamma$ and H $\rightarrow$ ZZ $\rightarrow$ 4e decay channels. The results are obtained from a simultaneous fit to the reconstructed invariant mass peaks in the two channels and for the two experiments. The measured masses from the individual channels and the two experiments are found to be consistent among themselves. The combined measured mass of the Higgs boson is m_H=125.09±0.21 (stat)±0.11 (syst) GeV.
Keywords: Higgs boson; CMS ;Atlas.

362. Evidence for Collective Multiparticle Correlations in P-Pb Collisions

Ali Yehia Ellithi Kamel et al

Physical Review Letters, 115: 12301-0 (2015) IF: 7.512

The second-order azimuthal anisotropy Fourier harmonics, v_2, are obtained in p-Pb and PbPb collisions over a wide pseudorapidity (η) range based on correlations among six or more charged particles. The p-Pb data, corresponding to an integrated luminosity of 35 nb^{-1}, were collected during the 2013 LHC p-Pb run at a nucleon-nucleon center-of-mass energy of 5.02 TeV by the CMS experiment. A sample of semiperipheral PbPb collision data at $\sqrt{s_{NN}}$= 2.76 TeV, corresponding to an integrated luminosity of 2.5 µb-1 and covering a similar range of particle multiplicities as the p-Pb data, is also analyzed for comparison. The six- and eight-particle cumulant and the Lee-Yang zeros methods are used to extract the v_2 coefficients, extending previous studies of two- and four-particle correlations. For both the p-Pb and PbPb systems, the v_2 values obtained with correlations among more than four particles are consistent with previously published four-particle results. These data support the interpretation of a collective origin for thepreviously observed long-range (large $\Delta\eta$) correlations in both systems. The ratios of v_2 values corresponding to correlations including different numbers of particles are compared to theoretical predictions that assume a hydrodynamic behavior of a p-Pb system dominated by fluctuations in the positions of participant nucleons. These results provide new insights into the multiparticle dynamics of collision systems with a very small overlapping region
Keywords: P-Pb collision ; Multiparticle production.

363. Measurement of J=ψ and ψ(2S) Prompt Double-DifferentialCross Sections in pp Collisions at $\sqrt{s}$ =7 TeV

Ali Yehia Ellithi Kamel et al.

Physical Review Letters, 114: 191802-0 (2015) IF: 7.512

The double-differential cross sections of promptly produced J=ψ and ψ(2S) mesons are measured in ppcollisions at t $\sqrt{s}$ =7 TeV, as a function of transverse momentum pT and absolute rapidity jyj.

The analysisuses J=ψ and ψ(2S) dimuon samples collected by the CMS experiment, corresponding to integrated luminosities of 4.55 and 4.90 fb^{-1}, respectively. The results are based on a two-dimensional analysis of the dimuon invariant mass and decay length, and extend to pT ¼ 120 and 100 GeV for the J=ψ and ψ(2S),respectively, when integrated over the interval |y|< 1.2. The ratio of the ψ(2S) to J=ψ cross sections is also reported for|y| < 1.2, over the range 10 < pT < 100 GeV. These are the highest pT values for which the cross sections and ratio have been measured.
Keywords: Pp collision; (2S) J/ cross sections.

364. Precision Measurements of A_1^n in the Deep Inelastic Regime

D.S.Parnoa, D.Flay, M.Posik, K.Allada, W.Armstrong, T.Averett, F.Benmokhtar, W.Bertozzi, A.Camsonne, M.Canani, G.D.Catesj, C.Chen, J.-P.Chen, S.Choi, E.Chudakov, F.Cusannom, M.M.Dalton, W.Deconinck, C.W.deJagerh, X.Dengj, A.Deurh, C.Dutta, L.ElFassi, G.B.Franklina, M.Frienda, H.Gaoq, F.Garibaldim, S.Giladg, R.Gilmanh, O.Glamazdinr, S.Golgei, J.Gomezh, L.Guos, O.Hansenh, D.W.Higinbothamh, T.Holmstrom, J.Huan, C.Hydei, H.F.Ibrahim and et al

Physics Letters B, 744: 309-314 (2015) IF: 6.131

We have performed precision measurements of the double-spin virtual-photon asymmetry A1 on the neutron in the deep inelastic scattering regime, using an open-geometry, large-acceptance spectrometer and a longitudinally and transversely polarized 3 He target. Our data cover a wide kinematic range 0.277=x=0.548 at an average Q^2 value of 3.078 $(GeV/c)^2$, doubling the available high-precision neutron data in this x range. We have combined our results with world data on proton targets to make a leading-order extraction of the ratio of polarized-to-unpolarized parton distribution functions for up quarks and for down quarks in the same kinematic range. Our data are consistent with a previous observation of an A1n zero crossing near x=0.5. We find no evidence of a transition to a positive slope in $(\Delta d+\Delta d^-)/(d+d^-)$ up to x=0.548.
Keywords: Spin structure functions; Nucleon structure; Parton distribution functions; Polarized electron scattering.

365. Search for Resonances and Quantum Black Holes Using Dijet Mass Spectra in Proton-Proton Collisions at $\sqrt{s}$ =8TeV

Ali Yehia Ellithi Kamel et al

Physical Review D, 91: 52009-0 (2015) IF: 4.643

A search for resonances and quantum black holes is performed using the dijet mass spectra measured in proton-proton collisions at $\sqrt{s}$ =8TeV with the CMS detector at the LHC. The data set corresponds to an integrated luminosity of 19.7fb^{-1}. In a search for narrow resonances that couple to quark-quark, quark-gluon, or gluon-gluon pairs, model-independent upper limits, at 95% confidence level, are obtained on the production cross section of resonances, with masses above 1.2 TeV. When interpreted in the context of specific models the limits exclude string resonances with masses below 5.0 TeV; excited quarks below 3.5 TeV; scalar diquarks below 4.7 TeV; W' bosons below 1.9 TeV or between 2.0 and 2.2 TeV; Z' bosons below 1.7 TeV; and Randall-Sundrum

gravitons below 1.6 TeV. A separate search is conducted for narrow resonances that decay to final states including b quarks. The first exclusion limit is set for excited b quarks, with a lower mass limit between 1.2 and 1.6 TeV depending on their decay properties. Searches are also carried out for wide resonances, assuming for the first time width-to-mass ratios up to 30%, and for quantum black holes with a range of model parameters. The wide resonance search excludes axigluons and colorons with mass below 3.6 TeV, and color-octet scalars with mass below 2.5 TeV. Lower bounds between 5.0 and 6.3 TeV are set on the masses of quantum black holes.

Keywords: P-Pb collision; Z+Jets multiplicities; Quantum black holes; Narrow resonances.

366. Search for Supersymmetry Using Razor Variables in Events with B-Tagged Jets in Pp Collisions at $\sqrt{s}$ =8TeV

Ali Yehia Ellithi Kamel et al

Physical Review D, 91: 52018-0 (2015) IF: 4.643

An inclusive search for supersymmetry in events with at least one b-tagged jet is performed using proton-proton collision data collected by the CMS experiment in 2012 at a center-of-mass energy of 8 TeV. The data set size corresponds to an integrated luminosity of 19.3fb^{-1}. The two-dimensional distribution of the razor variables R_2 and MR is studied in events with and without leptons. The data are found to be consistent with the expected background, which is modeled with an empirical function. Exclusion limits on supersymmetric particle masses at a 95% confidence level are derived in several simplified supersymmetric scenarios for several choices of the branching fractions. By combining the likelihoods of a search in events without leptons and a search that requires a single lepton (electron or muon), an improved bound on the top-squark mass is obtained. Assuming the lightest supersymmetric particle to be stable and weakly interacting, and to have a mass of 100 GeV, the branching-fraction-dependent (-independent) production of gluinos is excluded for gluino masses up to 1310 (1175) GeV. The corresponding limit for top-squark pair production is 730 (645) GeV.

Keywords: P-Pb Collision; Multiparticle production; Tagged jets; Super symmetric particles.

367. Study of Final-State Radiation in Decays of Z Bosons Produced in Pp Collisions at 7 TeV

Ali Yehia Ellithi Kamel et al

Physical Review D, 91: 92012-0 (2015) IF: 4.643

The differential cross sections for the production of photons in Z→ μ+μ−γ decays are presented as a function of the transverse energy of the photon and its separation from the nearest muon. The data for these measurements are collected with the CMS detector and correspond to an integrated luminosity of 4.7fb^{-1} of pp collisions at sv=7TeV delivered by the CERN LHC. The cross sections are compared to simulations with powheg and pythia, where pythia is used to simulate parton showers and final-state photons. These simulations match the data to better than 5%.

Keywords: Photon production; Pp collision.

368. Constraints on the Spin-Parity and Anomalous Hvv Couplings of The Higgs Boson in Proton Collisions at 7 and 8 Tev

Ali Yehia Ellithi Kamel et al

Physical Review D, 92: 12004-0 (2015) IF: 4.643

The study of the spin-parity and tensor structure of the interactions of the recently discovered Higgs boson is performed using the H → ZZ, Zγ $γ^*γ^*$ → 4e, H → WW → evev, and H → γγ decay modes. The full data set recorded by the CMS experiment during the LHC run 1 is used, corresponding to an integrated luminosity of up to 5.1fb$_{-1}$ at a center-of-mass energy of 7 TeV and up to 19.7fb^{-1} at 8 TeV. A wide range of spin-two models is excluded at a 99% confidence level or higher, or at a 99.87% confidence level for the minimal gravitylike couplings, regardless of whether assumptions are made on the production mechanism. Any mixed-parity spin-one state is excluded in the ZZ and WW modes at a greater than 99.999% confidence level. Under the hypothesis that the resonance is a spin-zero boson, the tensor structure of the interactions of the Higgs boson with two vector bosons ZZ, Zγ, γγ, and HWW is investigated and limits on eleven anomalous contributions are set. Tighter constraints on anomalous HVV interactions are obtained by combining the HZZ and HWW measurements. All observations are consistent with the expectations for the standard model Higgs boson with the quantum numbers $J^{PC}=0^{++}$.

Keywords: Higgs boson; Spin-parity; Tensor structure; Interactions of higgs boson.

369. Search for the Standard Model Higgs Boson Produced Through Vector Boson Fusion and Decaying to Bb⁻

Ali Yehia Ellithi Kamel et al

Physical Review D, 92: 32008-0 (2015) IF: 4.643

A first search is reported for a standard model Higgs boson (H) that is produced through vector boson fusion and decays to a bottom-quark pair. Two data samples, corresponding to integrated luminosities of 19.8fb^{-1} and 18.3fb^{-1} of proton-proton collisions at $\sqrt{s}$ =8TeV were selected for this channel at the CERN LHC. The observed significance in these data samples for a H → bb⁻ signal at a mass of5 12 GeV is 2.2 standard deviations, while the expected significance is 0.8 standard deviations. The fitted signal strength μ=σ/ $σ_{SM}$=2.8$^{+1.6}_{-1.4}$. The combination of this result with other CMS searches for the Higgs boson decaying to a b-quark pair yields a signal strength of 1.0±0.4, corresponding to a signal significance of 2.6 standard deviations for a Higgs boson mass of 125 GeV.

Keywords: Higgs boson; Vector boson.

370. Production of Leading Charged Particles and Leading Charged-Particle Jets at Small Transverse Momenta in Pp Collisions at $\sqrt{s}$ =8TeV

Ali Yehia Ellithi Kamel et al

Physical Review D, 92: 112001-0 (2015) IF: 4.643

The per-event yield of the highest transverse momentum charged particle and charged-particle jet ,integrated above a given p_T^{min}

thre shold starting at p_T^{min} = 0.8 and 1 GeV, respectively, is studied in pp collisions at $\sqrt{s}$ =8TeV. The particles and the jets are measured in the pseudorapidity ranges |η|< 2.4 and 1.9, respectively. The data are sensitive to the momentum scale at which parton densities saturate in the proton, to multiple partonic interactions, and to other key aspects of the transition between the soft and hardQCD regimes in hadronic collisions

Keywords: Pp collision; Charged particle production; Parton density; QCD.

371. Measurements of jet multiplicity and differential production cross sections of   Z þ jets events in proton-proton collisions at$\sqrt{s}$ =7TeV

Ali Yehia Ellithi Kamel et al

Physical Review D, 91: 52008-0 (2015) IF: 4.643

Measurements of differential cross sections are presented for the production of a Z boson and at least one hadronic jet in proton-proton collisions at $\sqrt{s}$ =7TeV, recorded by the CMS detector, using a data samplecorresponding to an integrated luminosity of 4.9 fb^{-1}. The jet multiplicity distribution is measured for up tosix jets. The differential cross sections are measured as a function of jet transverse momentum andpseudorapidity for the four highest transverse momentum jets. The distribution of the scalar sum of jet transverse momenta is also measured as a function of the jet multiplicity. The measurements are comparedwith theoretical predictions at leading and next-to-leading order in perturbative QCD

Keywords: Jet multiplicity; Pp collision.

372. Measurement of Diffractive Dissociation Cross Sections in Pp Collisions at $\sqrt{s}$ =7TeV

Ali Yehia Ellithi Kamel et al

Physical Review D, 92: 12003-0 (2015) IF: 4.643

Measurements of diffractive dissociation cross sections in pp collisions at $\sqrt{s}$ =7TeV are presented in kinematic regions defined by the masses MX and MY of the two final-state hadronic systems separated by the largest rapidity gap in the event. Differential cross sections are measured as a function of ξX = M2X/s in the region 5.5< $\log_{10}$ξX < -2.5, for $\log_{10}$M$_Y$ <0.5, dominated by single dissociation (SD), and 0.5< $\log_{10}$M$_Y$< 1.1, dominated by double dissociation (DD), where MX and MYare given in GeV. The inclusive pp cross section is also measured as a function of the width of the central pseudorapidity gap Δη for Δη for >3, $\log_{10}$M$_X$>1.1, and $\log_{10}$M$_Y$ > 1.1, a region dominated by DD. The cross sections integrated over these regions are found to be, respectively, 2.99 ± 0.02(stat) $^{+0.32}_{-0.29}$(syst) mb , 1.18±0.02(stat)±0.13(syst) mb, and 0.58±0.01(stat) $^{+0.13}_{-0.11}$(syst) mb, and are used to extract extrapolated total SD and DD cross sections. In addition, the inclusive differential cross section, dσ=dΔηF, for events with a pseudorapidity gap adjacent to the edge of the detector, is measured over ΔηF =8.4 units of pseudorapidity. The results are compared to those of other experiments and to theoretical predictions and found compatible with slowly rising diffractive cross sections as a function of center-of-mass energy.

Keywords: Pp collision;Diffractive dissociation; Rapidity gap.

373. Evidence for Transverse-Momentum- and Pseudorapidity-Dependent Event-Plane Fluctuations in Pbpb and Ppb Collisions

Ali Yehia Ellithi Kamel et al

Physical Review C, 92: 34911-0 (2015) IF: 3.733

A systematic study of the factorization of long-range azimuthal two-particle correlations into a product of single-particle anisotropies is presented as a function of pT and of both particles and as a function of the particle multiplicity in PbPb and pPb collisions. The data were taken with the CMS detector for PbPb collisions at $\sqrt{s}_{NN}$ =2.76 TeV and pPb collisions at $\sqrt{s}_{NN}$=5.02 TeV, covering a very wide range of multiplicity. Factorization is observed to be broken as a function of both particle pT and. When measured with particles of different pT, the magnitude of the factorization breakdown for the second Fourier harmonic reaches 20% for very central PbPb collisions but decreases rapidly as the multiplicity decreases. The data are consistent with viscous hydrodynamic predictions, which suggest that the effect of factorization breaking is mainly sensitive to the initial-state conditions rather than to the transport properties (e.g., shear viscosity) of the medium. The factorization breakdown is also computed with particles of different. The effect is found to be weakest for mid-central PbPb events but becomes larger for more central or peripheral PbPb collisions, and also for very-high-multiplicity pPb collisions. The -dependent factorization data provide new insights to the longitudinal evolution of the medium formed in heavy ion collisions.

Keywords: P-Pb collision; Pb-Pb collision; Two particle correlation; Hydrodynamic model

374. Spectroscopy of $_\Lambda^9$Li by Electroproduction

G. M. Urciuoli, F. Cusanno, S. Marrone, A. Acha, P. Ambrozewicz, K. A. Aniol, P. Baturin, P. Y. Bertin, H. Benaoum, K. I. Blomqvist, W. U. Boeglin, H. Breuer, P. Brindza, P. Byd´zovsk´y, A. Camsonne,5 C. C. Chang, J.-P. Chen, Seonho Choi, E. A. Chudakov, E. Cisbani, S. Colilli, L. Coman, B. J. Craver, G. De Cataldo, C. W. de Jager, R. De Leo, A. P. Deur, C. Ferdi, R. J. Feuerbach, E. Folts, R. Fratoni, S. Frullani, F. Garibaldi, O. Gayou, F. Giuliani, J. Gomez, M. Gricia, J. O. Hansen, D. Hayes, D. W. Higinbotham, T. K. Holmstrom, C. E. Hyde, H. F. Ibrahim and et al

Physical Review C, 91: 34308-34308 (2015) IF: 3.733

Background: In the absence of accurate data on the free two-body hyperon-nucleon interaction, the spectra of hypernuclei provides information on the details of the effective hyperon-nucleon interaction.

Purpose: To obtain a high-resolution binding-energy spectrum for the ^{9}Be(e,e'K$^+$)$_\Lambda^9$Li reaction.

Method: Electroproduction of the hypernucleus Li9 has been studied for the first time with sub-MeV energy resolution in Hall A at Jefferson Lab on a ^{9}Be target. In order to increase the counting rate and to provide unambiguous kaon identification, two superconducting septum magnets and a ring imaging Cherenkov detector were added to the Hall A standard equipment.

Results: The cross section to low-lying states of $_\Lambda^9$Li is concentrated within 3 MeV of the ground state and can be fit with four peaks. The positions of the doublets agree with theory while a disagreement could exist with respect to the relative strengths of

the peaks in the doublets. The separation energy, B_Λ, of 8.36±0.08 (stat.) ±0.08 (syst.) MeV was measured, in agreement with an earlier experiment.

Keywords: Hypernucleus; Electroproduction; Doublet superconductivity; Lambda; Hypernucleus; Lithium; Hypernucleus; Electron nucleus: Scattering; Hypernucleus; Energy levels.

375. Double Spin Asymmetries of Inclusive Hadron Electroproductions from A Transversely Polarized - ³He Target

Y. X. Zhao, K. Allada, K. Aniol, J. R. M. Annand, T. Averett, F. Benmokhtar,7 W. Bertozzi, P. C. Bradshaw, P. Bosted, A. Camsonne, M. Canan, G. D. Cates, C. Chen, J.-P. Chen, W. Chen, K. Chirapatpimol, E. Chudakov, E. Cisbani, J. C. Cornejo, F. Cusanno, M. Dalton, W. Deconinck, C. W. de Jager, R. De Leo, X. Deng, A. Deur, H. Ding, P. A. M. Dolph, C. Dutta, D. Dutta, L. El Fassi, S. Frullani, H. Gao, F. Garibaldi, D. Gaskell, S. Gilad, R. Gilman, O. Glamazdin, S. Golge, L. Guo, D. Hamilton, O. Hansen, D. W. Higinbotham, T. Holmstrom, J. Huang, M. Huang, H. F. Ibrahim and et al

We report the measurement of beam-target double spin asymmetries (A_{LT}) in the inclusive production of identified hadrons, $\vec{e}+{}^3\text{He}\uparrow \to h + X$ using a longitudinally polarized 5.9-GeV electron beam and a transversely polarized ³He target. Hadrons ($\pi\pm$,K±, and proton) were detected at 16° with an average momentum <Ph>=2.35 GeV/c and a transverse momentum (pT) coverage from 0.60 to 0.68 GeV/c. Asymmetries from the ³He target were observed to be nonzero for p± production when the target was polarized transversely in the horizontal plane. The p+ and p- asymmetries have opposite signs, analogous to the behavior of ALT in semi-inclusive deep-inelastic scattering.

Keywords: Hadron; Electroproduction; Spin; Asymmetry; Deep inelastic scattering; Semi-inclusive reaction; Inclusive production; Transverse momentum; Parton; Helicity; Cross section.

376. Moments of the Neutron G2 Structure Function at Intermediate Q^2

P. Solvignon, N. Liyanage, J.-P. Chen, Seonho Choi, K. Slifer, K. Aniol,5 T. Averett,6 W. Boeglin, A. Camsonne, G. D. Cates, C. C. Chang, E. Chudakov, B. Craver, F. Cusanno, A. Deur,3 D. Dutta, R. Ent, R. Feuerbach, S. Frullani, H. Gao, F. Garibaldi, R. Gilman, C. Glashausser, V. Gorbenko, O. Hansen, D. W. Higinbotham, H. Ibrahim and et al

We present new experimental results for the He-3 spin structure function g2 in the resonance region at Q2 values between 1.2 and 3.0(GeV/c)^2. Spin dependent moments of the neutron were extracted. Our main result, the inelastic contribution to the neutron d2 matrix element, was found to be small at <Q^2>=2.4(GeV/c)^2 and in agreement with the lattice QCD calculation. The Burkhardt-Cottingham sum rule for He-3 and the neutron was tested with the measured data and using the Wandzura-Wilczek relation for the low x unmeasured region.

377. E00-110 Experiment at Jefferson Lab Hall A: Deeply Virtual Compton Scattering of the Proton At 6 GeV

M. Defurne, M. Amaryan, K. A. Aniol, M. Beaumel, H. Benaoum, P. Bertin, M. Brossard, A. Camsonne, J.-P. Chen, E. Chudakov, B. Craver, F. Cusanno, C. W. de Jager, A. Deur, R. Feuerbach, C. Ferdi, J.-M. Fieschi, S. Frullani, E. Fuchey, M. Garç¸on,1 F. Garibaldi, O. Gayou, G. Gavalian, R. Gilman, J. Gomez, P. Gueye, P. A. M. Guichon, B. Guillon, O. Hansen, D. Hayes, D. Higinbotham, T. Holmstrom, C. E. Hyde, H. Ibrahim and et al.

We present final results on the photon electroproduction ($\vec{e}p \to ep\gamma$) cross section in the deeply virtual Compton scattering (DVCS) regime and the valence quark region from Jefferson Lab experiment E00-110. Results from an analysis of a subset of these data were published before, but the analysis has been improved, which is described here at length, together with details on the experimental setup. Furthermore, additional data have been analyzed, resulting in photon electroproduction cross sections at new kinematic settings for a total of 588 experimental bins. Results of the Q2 and xB dependencies of both the helicity-dependent and the helicity-independent cross sections are discussed. The Q2 dependence illustrates the dominance of the twist-2 handbag amplitude in the kinematics of the experiment, as previously noted. Thanks to the excellent accuracy of this high-luminosity experiment, it becomes clear that the unpolarized cross section shows a significant deviation from the Bethe-Heitler process in our kinematics, compatible with a large contribution from the leading twist-2 DVCS2 term to the photon electroproduction cross section. The necessity to include higher-twist corrections to fully reproduce the shape of the data is also discussed. The DVCS cross sections in this paper represent the final set of experimental results from E00-110, superseding the previous publication.

Keywords: Photon; Electroproduction; Correction; Higher-twist; Luminosity- high; Quark-valence; Deeply virtual compton Scattering; Bethe-heitler.

378. Single Universal Curve for A Decay Derived from Semi-Microscopic Calculations

M. Ismail, W. M. Seif , A. Y. Ellithi and A. Abdurrahman

A universal curve is one of the simple ways to get preliminary information about the a-decay half-life times of heavy nuclei. We try to find parametrization for the universal curve of a decay based on semi-microscopic calculations starting from the realistic Michigan-three-Yukawa Reid nucleon-nucleon interaction. Within the deformed density-dependent cluster model, the penetration probability and the assault frequency are calculated using the Wentzel-Kramers-Brillouin approximation. The deformations of daughter nuclei and the ground-state spin and parity of the involved nuclei are considered. For all studied decays, we found that it is accurate enough to express the assault

frequency either as a function of the mass number of the parent nuclei or as a constant average value. The average preformation probability of the a cluster inside four groups of 166 even- (Z) - even (N), 117 odd-even, 141 even-odd, and 72 odd-odd a emitters is obtained, individually. The effects of participating unpaired nucleons in the involved nuclei as well as the influence of any differences in their ground-state spin and/or parity appear in the obtained average values of the preformation probability. We suggested a single universal curve for a decay with only one parameter. This parameter varies according to the classified four groups. It includes the preformation probability and the average assault frequency in addition to the pairing contribution.

Keywords: Alpha decay; Preformation Probability; Single universal curv; Deformed nuclei; Decay half-Life.

379. Preformation Probability Inside A Emitters Having Different Ground State Spin-Parity Than Their Daughters

W. M. Seif, M. M. Botros and A. I. Refaie

The ground state spin and parity of a daughter formed in a radioactive a emitter are expected to influence the preformation probability of the a and daughter clusters inside it. We investigate the a and daughter preformation probability inside odd-A and doubly odd radioactive nuclei when the daughter and parent are of different spin and/or parity. We consider only the ground state to ground state unfavored decays. This is to extract precise information about the effect of the difference in the spin-parity of the ground states of the involved nuclei far away from any influence from the excitation energy, if the decays are coming from isomeric states. The calculations are done for 161a emitters, with 65=Z=112 and 84=N=173, in the framework of the extended cluster model, with the Wentzel-Kramers-Brillouin penetrability and assault frequency. We used a Hamiltonian energy density scheme based on the Skyrme SLy4 interaction to compute the interaction potential. The a-plus-cluster preformation probability is extracted from the calculated decay width and the experimental half-life time. We discussed in detailed steps the effect of the angular momentum of the emitted a particle on the various physical quantities involved in the unfavored decay process and how it finally increases the half-life time. We found that if the ground state spin and/or parity of parent and daughter nuclei are different, then the preformation probability of the a cluster inside the parent is less than it would be if they had similar spin-parity. We modified the formula that gives the a preformation probability in terms of the numbers of protons and neutrons outside the shell closures of the parent, to account for this hindrance in the preformation probability for the unfavored decays between ground states.

Keywords: Alpha decay; Preformation probability; Spin; Parity; Deformed nuclei; Decay half-Life.

380. Nucleon Pairing Correlations and the A Cluster Preformation Probability Inside Heavy and Superheavy Nuclei

W. M. Seif

The presence of paired or unpaired protons and neutrons in the open-shell radioactive a emitter affects the preformation probability of the a cluster inside it. The a-preformation probability inside the odd(Z)-even(N), even(Z)-odd(N), and odd(Z)-odd(N) a emitters is investigated. The study is restricted to those decays with no angular momentum transfer to make a precise prediction about the mere pairing effect. The extended cluster model of a decay and the WKB approximation are used by taking into account the deformation degrees of freedom to carry out the calculations for 105 parent nuclei in the mass region of A=175–289. The a + daughter interaction potential is calculated by using the Hamiltonian energy-density approach in terms of the SLy4 Skyrme-like interaction, then it is implemented to find the average decay width over the different orientations. The half-life of the decay is then estimated and employed in turn to extract the a-preformation probability by taking account of errors on both the released energy and the experimental half-life time. According to the present calculations, it is found that the a cluster preformation probability inside the nuclei which have unpaired nucleons is less than it would be in the neighboring nuclei of the same shell and subshell closures but have no unpaired nucleons. In particular, the effect of the single unpaired neutron in the even(Z)-odd(N) nuclei is slightly larger than that of the single unpaired proton in the odd(Z)-even(N) ones. The effect of the unpaired nucleons appears more clearly in the odd(Z)-odd(N) nuclei which have both an unpaired neutron and an unpaired proton. Based on the obtained results, an empirical pairing term is added to the empirical formula [J. Phys. G 40, 105102 (2013)] that relates the a cluster preformation probability to the proton and neutron numbers outside the closed shells of the parent nucleus.

Keywords: Alpha decay; Preformation probability; Pairing; Deformed nuclei; Decay half-Life.

381. Fine Structure in A Decay of Even-Even Nuclei Using A Finite-Range Nucleon-Nucleon Interaction

A. Adel and T. Alharbi

A systematic study on a-decay fine structure is presented for even-even nuclei in the range $78 \leq Z \leq 102$. The penetration probability is obtained from the WKB approximation in combination with the Bohr-Sommerfeld quantization condition. The potential barrier is numerically constructed in the well-established double-folding model for both Coulomb and nuclear potentials. A realistic M3Y interaction, based on the G-matrix elements of the Paris NN potential, has been used in the folding calculation. The local approximation for the nondiagonal one-body density matrix in the calculation of the exchange potential was included by using the harmonic oscillator representation of the nondiagonal density matrix of the a particle. The computed partial half-lives and branching ratios are compared with the recent experimental data and they are in good agreement.

Keywords: A-Decay; Wkb approximation; Fine structure.

382. Hydrogen Alpha Laser-Ablation Plasma Diagnostics

C. G. Parigger, D. M. Surmick, G. Gautam, and A. M. El Sherbini

Spectral measurements of the Hα Balmer series line and the continuum radiation are applied to draw inferences of electron density, temperature, and the level of self-absorption in laser-ablation of a solid ice target in ambient air. Electron densities of 17 to 3.2×1024 m^{-3} are determined from absolute-calibrated emission coefficients for time delays of 100 ns to 650 ns after generation of laser plasma using ǫ switched Nd: YAG radiation. The corresponding temperatures of 4.5 to 0.95 eV were evaluated from the absolute spectral radiance of the continuum at the longer wavelengths. The red-shifted, Stark-broadened hydrogen alpha line emerges from the continuum radiation after a time delay of 300 ns. The electron densities inferred from power law formulae agree with the values obtained from the plasma emission coefficients

Keywords: Plasma diagnostics; Spectroscopy; Atomic; Plasma spectroscopy;Laser induced breakdown.

383. Advances in Atomic Physics four Decades of Contribution of the Cairo University – Atomic Physics Group

Tharwat M. El-Sherbini

Journal of Advanced Research, 6: 643-661 (2015) IF: 3

In this review article, important developments in the field of atomic physics are highlighted and linked to research works the author was involved in himself as a leader of the Cairo University – Atomic Physics Group. Starting from the late 1960s – when the author first engaged in research - an overview is provided of the milestones in the fascinating landscape of atomic physics.

Keywords: Atomic physics; Laser physics; Plasma physics.

384. Effect of Deformations on the Binding Energy of Centrally Depressed Nuclei

Ismail, M. Ellithi, A. Y. Adel A and Abdulghany A. R

Journal of Physics G: Nuclear and Particle Physics, 42: 75108-0 (2015) IF: 2.777

The energy density formalism is implemented to study the binding energy of some heavy, superheavy and hyperheavy nuclei. The macroscopic contribution of binding energy is derived in the presence of a depression parameter in the nuclear density distribution, and the total energy is obtained by adding the shell and pairing correction to the macroscopic part. Total energy is studied with the variation of quadrupole β_2 and hexadecapole β_4 deformation parameters using different values of depression parameter. The addition of the shell and pairing corrections affects the behavior of the total energy especially the minimum position at specific deformation parameters, a second minimum in some cases are close to the first one, suggesting the possible existence of shape isomers. We minimized the total energy with respect to deformation and density depression parameters and obtained the binding energy of 208Pb, 238U, 252Cf, 280Cn, 285-289Fl, 298Fl, 306120, 320126, 339136, 500174 and 700226. The binding energies obtained are in good agreement with the available experimental data. The difference between the binding energies obtained by this simple method and experimental ones is less than 0.13%.

Keywords: Binding energy; Superheavy nuclei; Deformed nuclei; Central depression.

385. 6Li Breakup and Suppression of Complete Fusion Above the Coulomb Barrier

N.A. Elmahdy, A.S. Denikin,M. Ismail and A.Y. Ellithi

The European Physical Journal A, 51: 1-6 (2015) IF: 2.736

We study the role of the projectile breakup in the fusion process by example of the 6Li reactions with the 59Co, 144Sm and 209Bi targets in vicinity of the Coulomb barrier. The coupled channel and distorted wave approaches are employed in order to calculate the complete fusion and the breakup cross sections, respectively. The partial cross sections in both the channels are compared in order to estimate the breakup fraction responsible for the suppression of complete fusion. The calculations are compared with available experimental data. The conclusions and recommendations are made.

Keywords: Coulomb barrier; Fusion; Break Up.

386. Synthesis, Characterization, Optical and Antimicrobial Studies of Polyvinyl Alcohol–Silver Nanocomposites

K.H. Mahmoud

Spectrochimica Acta Part A: Molecular And Biomolecular Spectroscopy, 138: 434-440 (2015) IF: 2.353

Silver nanoparticles (Ag NPs) were synthesized by chemical reduction of silver salt (AgNO3) through sodium borohydride. The characteristic surface plasmon resonance band located at around 400 nm in the UV–Visible absorption spectrum confirmed the formation of Ag nanoparticles. Polyvinyl alcohol–silver (PVA–Ag) nanocomposite films were prepared by the casting technique. The morphology and interaction of PVA with Ag NPs were examined by transmission electron microscopy and FTIR spectroscopy. Optical studies show that PVA exhibited indirect allowed optical transition with optical energy gap of 4.8 eV, which reduced to 4.45 eV under addition of Ag NPs. Optical parameters such as refractive index, complex dielectric constant and their dispersions have been analyzed using Wemple and DiDomenco model. Color properties of the nanocomposites are discussed in the framework of CIE L*u*v* color space. The antimicrobial activity of the nanocomposite samples was tested against Gram positive bacteria (Staphylococcus aureus NCTC 7447 & Bacillus subtillis NCIB 3610), Gram negative bacteria (Escherichia coli, NTC10416 & Pseudomonas aeruginosa NCIB 9016) and fungi (Aspergillus niger Ferm – BAM C-21) using the agar diffusion technique. The antimicrobial study showed that PVA has moderate antibacterial activity against B. subtillis and the 0.04 wt% Ag NPs composite sample effect was strong against S. aureus.

Keywords: Silver Nanoparticles; Pva; Optical properties; Antimicrobial activity.

387. Ac Electrical Conductivity and Dielectric Studies of Bulk P-Quaterphenyl

A.A. Attia, H.S. Soliman, M.M. Saadeldin and K. Sawaby

Synthetic Metals, 205: 139-144 (2015) IF: 2.252

The frequency and temperature dependence of AC conductivity, dielectric constant and dielectric loss of p-quaterphenyl in pellet

form were investigated in the frequency range of 200 Hz–2.4 MHz and temperature range of 301–423 K. The X-ray diffraction of p-quaterphenyl at room temperature shows monoclinic structure. The unit cell parameters and the values of Miller indices hkl and lattice spacing dhkl corresponding to each diffraction line of p-quaterphenyl were investigated using some computer programs. The behavior of AC conductivity was interpreted by the correlated barrier hopping (CBH) model. Temperature dependence of AC conductivity indicates that AC conduction is a thermally activated process. AC activation energy decreases with increasing frequency which confirms the hopping conduction as the dominant mechanism. The density of localized states N(EF) near the Fermi level was found in the range of 1.33–2.44 _1018 eV_1cm_3 for the investigated range of frequency and temperature. Dielectric constant and dielectric loss showed a decrease with increasing frequency and an increase with increasing temperature. The calculated value of the maximum barrier height Wm (0.64 eV) according to the Guintini equation agreed with that proposed by the theory of hopping of charge carriers over a potential barrier. Dielectric relaxation studies were obtained from the dielectric modulus. The frequency dependence of real and imaginary parts of the complex dielectric modulus was investigated for various temperatures. The frequencies corresponding to the maxima of the imaginary electric modulus at various temperatures were found to obey an Arrhenius law with an activation energy of 0.02 eV. The relaxation time decreases with the increase in temperature and the relaxation time at infinite temperature was 24.5 ms. The high frequency dielectric constant was estimated for various temperatures.

Keywords: P-Quaterphenyl.

388. A Comparative study on the magnetic and electrical properties of $MFe_{12}O_{19}$ (M=Ba and Sr) / $BiFeO_3$ nanocomposites

M.A.Ahmed, S.F.Mansour and H.Ismael

Journal of Magnetism and Magnetic Materials, 378: 376-388 (2015) IF: 1.97

M-type hexaferrite (MFe12O19) , M- Ba or Sr nanoparticles with hexagonal crystal structur ehave been successfully synthesized by a citrate auto-combustion method .BiFeO3 (BFO) was prepared by the flash auto-combustion technique. Different nanocompo sites were prepared according to the formula[(1-X) $MFe_{12}O_{19}$+XBiFeO₃; M = Ba or Sr, X = 0.3, 0.4, 0.5 and 0.6]. The structure and morphology of the obtained nanocomposites have been determined by X-ray diffraction(XRD) and field emission scanning electron microscopy (FESEM) .From the results, it is observed that the value of saturation magnetization decreases with increasing BFO content ,which was mainly due to the contribution of the volume o fthe weak- magnetic BFO to the total sample volume.

Keywords: M-Hexaferrite; Bifeo₃; Nanocomposites; Magnetization.

389. Electrochromic properties of amorphous and crystalline WO_3 Thin Films Prepared By Thermal Evaporation Technique

M.M. El-Nahass, M.M.Saadeldin, H.A.M.Ali and M.Zaghllol

Materials Science in semiconductor processing, 29: 201-205 (2015) IF: 1.955

The tungsten trioxides thin films were deposited by thermal evaporation method onto indium tin oxides coated onto glass substrates. The structural properties of the films were investigated by X-ray diffractometer and atomic force microscopy techniques. The as-deposited film shows a polycrystalline nature related to indium tin oxides planes and the WO_3 planes appears by annealing film to 773 K for 2 h. The 2D and 3D images were carried out using atomic force microscopy techniques. The film color is converted from transparent to deep blue color after applying electric field, and bleaching occurs by applying reverse electric field. The F-like color centers model was used to investigate the coloration in amorphous films. On the other hand, the crystalline films were characterized by the free carrier absorption mechanism. Both coloration response and coloration efficiency for the amorphous films are greater than crystalline. The coloration efficiency is found to be 31.25 cm^2/C for the as-deposited films and decreases to 18.3 cm^2/C by annealing films at 723 K.

Keywords: Tungsten trioxides; Electrochromic; Coloration efficiency; Thermal evaporation

390. Electrical and Thermal Investigations of Energetic Material (N-$C_{16}H_{33}NH_3)_2$CDCL$_4$

M.M. Abdelkadera, A.I. Abouda and W.M. Gamala

Philosophical Magazine, 95(21): 2323-2342 (2015) IF: 1.825

The thermal energy storage material, namely hexadecyl ammonium tetrachloro cadmate (n-C16H₃₃NH₃)₂CdCl₄, which belongs to the organic–inorganic hybrid layered compounds, was synthesized as an example of long-chain complexes of the series (n-CnH$_{2n+1}$NH₃)₂CdCl₄ (n = 8–18). The ac conductivity sac(ω, T) and the complex dielectric permittivity e*(ω, T) were extensively investigated as a function of both frequency (5–100 kHz) and temperature (100 K < T < 400 K). The general trend of the mentioned parameters indicates that the frequency dependent conductivity behaves according to the power law, namely ^{σ}ac(ω, T) αω^s(ω, T) where s is the frequency exponent (0 < s < 1). Furthermore, the differential scanning calorimetric chart and the differential thermal analysis thermogram were performed. The combination of thermal and electrical parameters confirms the existence of two main structural phase transitions of the first-order type at T ≈ 360.70 K (minor) and at T ≈ 350.70 K (major) in addition to two intermediate phases with a transition temperature at T ≈ 353.75 K. (The major transition precedes the minor one.) Different conduction mechanisms and the universality of ac conduction were discussed. The nature of each detected phase transition has been explained on the basis of the most recent crystal structure and particularly the role of the N–H Cl hydrogen bonding as a trigger force for phase transitions.

Keywords: Thermal energy storage materials; Organic–inorganic hybrid compounds; DSC and DTA thermograms; Dielectric properties; (N-$C_{16}H_{33}NH_3)_2$CdCL₄.

391. Entropy-Corrected New Agegraphic Dark Energy Model in the Context of Chern-Simons Modified Gravity

Ayman A. Aly, M. Fekry and H. Mansour

International Journal of Modern Physics D, 24: 1550044-0 (2015) IF: 1.741

Within the framework of Chern–Simons (CS) modified gravity, we studied dark energy models. The new agegraphic dark energy (NADE) model, entropy-corrected new agegraphic dark energy (ECNADE) model and NADE model with generalized uncertainty principle (GUP) are investigated. For these models, we studied the evolution of scale factor a, Hubble parameter H and deceleration parameter q. On meantime, we studied the state finder parameters s and r. These models show some similar behavior with modified Chaplygin gas model in some regions, while in other regions some similarity with phantom and quintessence dark energy is noticed.

Keywords: Cosmology; Dark energy; Nade; Ecnade; CS Modified gravity.

392. Infrared Study and Phase Transformation of The New Lithium–Diphenyl carbazide complex (LiDPC)

F. El-Kabbany, S. Taha b, M. Hafez and N.R. Abdel Aziz

Room temperature and 80 _C) is performed and new results are reported. Introducing lithium ions into diphenyl carbazide $C_{13}H_{14}N_4O$ forms a completely new complex associated with new properties. The IR spectroscopic analysis includes measurements and interpretation of the IR spectral band shape, intensities, and frequencies of the internal modes of vibrations. The principle modes of vibrations of amorphous DPC found to be 3445 cm^{-1}, 3292 cm^{-1}, 3052 cm^{-1}, 1670 cm^{-1}, 1602 cm^{-1}, 1495 cm^{-1}, 1305 cm^{-1}, 1254 cm^{-1}, 974 cm^{-1}, and 577 cm^{-1} correspond to normal vibrations of NAH, CAH, NAN, C@O and monosubstituted benzene. A marked change could be recorded for these modes of vibrations in the presence of Li+ ions. The results strongly confirm the formation of a metal–organic complex. Anomalous spectroscopic changes could be recorded in LiDPC spectra. A proposed Li+ position in LiDPC complex is proposed. X-ray diffraction analysis is used to find out the crystal structure and parameters of LiDPC complex. The results obtained show triclinic crystal structure with a = 5.6929 Å, b = 7.6378 Å, c = 17.8739 Å, α = 119.176, β = 63.322, γ = 85.378_. The results reveal the presence of an order–disorder phase transition in LiDPC complex at 60^0C. The transformation process is monitored by clear variations in the spectral shape, band intensities and new eight different modes appeared in the high temperature disordered phase. An energy model is suggested for the interpretation of such phase transition process. appeared in the high temperature disordered

Keywords: Lithium complex; IR analysis; X-ray analysis

393. Single Particle Spectrum of Pure Neutron Matter

Khalaf Gadand and Hesham Mansour

We have calculated the self-consistent auxiliary potential effects on the binding energy of neutron matter using the Brueckner–Hartree–Fock approach by adopting the Argonne V18 and CD-Bonn potentials. The binding energy with the four different choices for the self-consistent auxiliary potential is discussed.

Also, the binding energy of neutron matter has been computed within the framework of the self-consistent Green's function approach. We also compare the binding energies obtained in this study with those obtained by various microscopic approaches. It is found that the use of the continuous choice tends to give binding energies about 2–4MeV larger than the gap choice at k_F = 1.8 fm^{-1}. In the case of symmetric nuclear matter this difference is largerse

Keywords: Self Consistency;Binding energy;Neutron matter; BHF approach;Greens function.

394. Equation of State and Symmetry Energy at High Densities for Zero and Finite Temperatures

Khalaf Gad and Hesham Mansour

The equation of state of isospin asymmetric nuclear matter within the framework of the Brueckner theory is used to calculate the energy per particle for nuclear and neutron matter. Pressure and symmetry energy are also presented. Here we extended our work to include Skyrme-like zero-range density-dependent two-body forces, which could mimic threebody forces. A three-body forces are shown to be necessary for reproducing the empirical saturation properties of symmetric nuclear matter. We also studied the effect of extending the calculation to finite temperatures.

Keywords: Asymmetric nuclear matter; Energy PerParticle;Three body forces;Finite temperature.

395. Magnetically Roll-Oriented LaFeO₃ Nanospheres Prepared Using Oxalic Acid Precursor Method

L. M. Salah, M. M. Rashad, M. Haroun, M. Rasly and M. A. Soliman

Roll-oriented lanthanum orthoferrite $LaFeO_3$ powders have been successfully synthesized using oxalic acid precursor method. Well crystalline $LaFeO_3$ phase was obtained at different annealing temperatures from 600 to 1,000 C for 2 h. FT-IR spectrum indicated that two active vibrational bands were assigned at 555 and 400 cm^{-1} imputed the formation of lanthanum orthoferrite. The average particle size of $LaFeO_3$ powders were ranged from 50 to 150 nm. The magnetic properties of $LaFeO_3$ samples exhibited a weak ferromagnetic behavior at the room temperature. The shape and surface interface anisotropy were so far strong forming a roll-orientation of particles. The interplay between magnetic properties and annealing temperature showed that the low magnetic interactions between particles were observed as the result of large particles size produced and low surface–interface anisotropy occurred. Hence, microstructures were gradually transformed to tube- and then fibrous-like structures with increasing the annealing temperature. Results are explained in basis of spin–orbit interactions between particles. Furthermore, analysis of the AC electrical data in impedance and dielectric permittivity formalisms revealed the presence of three relaxation processes in $LaFeO_3$, with sufficiently different relaxation times.

Keywords: Magnetic;$LaFeO_3$; Nanospheres.

396. The Effect of Halo Nuclear Density on Reaction Cross-Section for Light Ion Collision

M. A. M. Hassan, M. S. M. Nour El-Din, A. Ellithi, E. Ismail and H. Hosny

International J. of Modern Physics E, 52: 1-15 (2015)   IF: 1.343

In the framework of the optical limit approximation (OLA), the reaction cross-section for halo nucleus — stable nucleus collision at intermediate energy, has been studied. The projectile nuclei are taken to be one-neutron halo (1NHP) and two-neutron halo (2NHP). The calculations are carried out for Gaussian–Gaussian (GG), Gaussian-Oscillator (GO), and Gaussian-2S (G2S) densities for each considered projectile. As a target, the stable nuclei in the range 4–28 of the mass number are used. An analytic expression of the phase shift function has been derived. The zero range approximation is considered in the calculations. Also, the in-medium effect is studied. The obtained results are analyzed and compared with the geometrical reaction cross-section and the available experimental data.

Keywords: Halo nuclei; Heavy Ion collision; Optical limit approximation.

397. Target Productions in Forward and Backward Hemispheres in The Interactions of ^{28}Si-EM at 14.6A GeV

A. Abdelsalam M, S. El-Nagdy, *A. M. Abdalla and A. Saber*

International J.l of Modern Physics, 24 (11): (2015)   IF: 1.343

This paper search for the results and properties of slow particle productions, appear as a gray and black tracks in nuclear emulsions, producing secondary charged particles which are emitted from ^{28}Si interactions with emulsion nuclei at 14.6A GeV. The forward particles emission of interactions, (θ lab $\leq 90^0$) as well as the backward ones ($\theta_{lab} = 90^0$), have been investigated. It includes the effect of both projectile mass number and energy on the production and multiplicities of these particles. The results compared with other experiments for the same target but with different projectiles and energies. The experimental data show that there are two different mechanisms responsible for the production of gray particles for the chosen channels of emission angles and each are energy dependence. This dependence is weakly on the projectile mass number. The same investigations are applied for black tracks producing particles. The experimental results show the production of these particles is purely target fragments independent on both projectile mass number and its energy. The anisotropy ratio of angular distribution (F/B) is applied for both kinds of particles which are found the value for gray particle production depends on the direction of emissions while it is unchanged for black particles.

Keywords: Slow fragments; particles multiplicities; forward and backward emission angles.

398. Systematics of Nucleon Density Distributions and Neutron Skin of Nuclei

W. M. Seif and Hesham Mansour

International Journal of Modern Physics E, 24   (11): 1550083-1550083 (2015) IF: 1.343

Proton and neutron density profiles of 760 nuclei in the mass region of A=16-304A=16-304 are analyzed using the Skyrme energy density for the parameter set SLy4. Simple formulae are obtained to fit the resulting radii and diffuseness data. These formulae are useful to estimate the values of the unmeasured radii and especially in extrapolating charge radii values for nuclei which are far from the valley of stability. Also, it provides an easy way to formulate the density profile for nuclear applications and to perform analytic calculations for bound and/or scattering problems. The obtained neutron and proton root-mean-square (rms) radii and the neutron skin thicknesses are in agreement with the available experimental data and previous Hartree–Fock (HF) calculations.

Keywords: Neutron density; Proton density; Neutron skin Thickness.

399. Study of Elastic and Inelastic Pion-Nucleus Scattering Using the Microscopic Model of Optical Potential

V. K. Lukyanov, E. V. Zemlyanaya, K. V. Lukyanov, A. Y. Ellithi and I. A. M. Abdul-Magead

International Journal of Modern Physics E, 24: 1550035-1550035 (2015) IF: 1.343

The pion-nucleus microscopic optical potential (OP), defined by the pion-nucleon scattering amplitude and by the generalized density distribution of a target nucleus that incudes internal degrees of freedom, is applied to construct the pion-nucleus differential cross-sections of elastic and inelastic scattering on the nuclei 28Si,58Ni,208Pb at Tlab = 291MeV. Calculations are based on the relativistic wave equation and thus relativistic effects and distortions on the relative motion wave functions are taken into account. The respective experimental data are analyzed and the in-medium parameters of the elementary pN-amplitude are established and compared with those from the pion scattering on free nucleons.

Keywords: Pion-Nucleus scattering; Microscopic optical Potential; Pion-nucleon scattering amplitude.

400. Pion Emission in Particle Interactions with Various

A. Abdelsalam, Z. Abou-Moussa, N. Rashed, B. M. Badawy, H. A. Amer, W. Osman, M. M. El-Ashmawy and N. Abdallah

Chinese Physics, 39 (9): (2015) IF: 1.313

The behavior of relativistic hadron multiplicity for 4He-nucleus interactions is investigated. The experi- ment is carried out at 2.1 A and 3.7 A GeV (Dubna energy) to search for the incident energyect on the interactions inside di erent emulsion target nuclei . Data are presented in terms of the number of emitted relativistic hadrons in both forward and backward angular zones. The dependence on the target size is presented. For this purpose the statistical events are discriminated into groups according to the interactions with H, CNO, Em, and AgBr target nuclei. The separation of events, into the mentioned groups, is executed basing on Glauber's multiple scattering theory approach. Features suggestive of a decay mechanism seem to be a characteristic of the backward emission of relativistic hadrons. The results strongly support the assumption that the relativistic

hadrons may already be emitted during the de-excitation of the excited target nucleus, in a behavior like that of compound-nucleus disintegration. Regarding the limiting fragmentation hypothesis beyond 1 A GeV, the target size is the main parameter aecting the backward production of the relativistic hadron. The incident energy is a principal factor responsible for the forward relativistic hadron production, implying that this system of particle production is a creation system. However, the target size is an e ective parameter as well as the projectile size considering the geometrical concept regarded in the nuclear reball model. The data are analyzed in the framework of the FRITIOF model.

Keywords: -Particle Interactions at Dubna Energies; Shower particle sources; Target size dependence; FRITIOF.

401. Investigation of Cation Distribution and Microstructure of Nano Ferrites Prepared by Different Wet Methods

Ebtesam Ateia, Lobna M. Salah and Asmaa A. H. El-Bassuony

Nanostructure ferrite of composition $Ni0.5Zn0.5$ $Cr0.1Fe1.9O4$ was prepared by sol–gel, co-precipitation, citrate-gel, flash and oxalate precursor methods. Structural and micro structural analysis of the investigated samples were carried out by X-rays diffractometer (XRD), infrared spectroscopy, transmission electron microscopy (TEM) and atomic force microscope. It was observed that the lattice parameter of cubic spinel was constant, and the positions of both tetrahedral and the octahedral bands had the fixed positions for all methods except flash and oxalate precursor methods. These results were explained on the basis of theoretical calculation of cation distribution for Ni–Zn–Cr ferrite. The average crystalline sizes of the investigated samples deduced by TEM were in good agreement with the one estimated by XRD. The above results were correlated to the results ofmagneticmeasurements of the investigated samples.

Keywords: Ceramics chemical synthesis X-Ray scattering; Infrared spectroscopy(IR); Hysteresis.

402. Emission Characteristics of Fast Target Protons in Ultrarelativistic ^{16}O–Nucleus Collisions

A. Abdelsalam, M.S. El-Nagdy, N. Rashed, B.M. Badawy, W. Osman, and M. Fayed

The target fragmentation in ^{60}A and 200A GeV 16O interactions with emulsion nuclei is analyzed. The validity of the nuclear limiting fragmentation hypothesis is confirmed at ultrarelativistic energies. The emission mechanism of the fast target proton (grey particle) is investigated in terms of the multiplicity characteristics. The anisotropy ratio and asymmetry parameter, while found to be independent of the projectile size or incident energy, are dependent on the target size and system centrality.

This dependence is insignificant for heavy targets and in more central regions, where constancy exists. In this species, the system of the grey particle emission cannot exhibit the optimum symmetry or asymmetry between the forward and backward hemispheres. It is seen that these target protons originate from two emission sources in the earlier stage of the target fragmentation. One them emits nucleons isotropically in the 4лspace. The other is the main emission source, which emits nucleons, in the forward hemisphere only, as a result of the binary nucleon–nucleon collisions and (or) intranuclear cascade.

403. Phase Transitions and Electrical Conduction in Thermal Energy Storage Compound (N-C$_{12}$H$_{25}$NH$_3$)$_2$CdCl$_4$

Mohamed Mahmoud Abdelkadera, Aboud Ibrahim Abouda and Wafia Mohamed Gamala

Differential scanning calorimetry (DSC) and differential thermal analysis (DTA) are performed for the compound (n-$C_{12}H_{25}NH3)_2CdCl_4$. The ac conductivity $^\sigma$ (ω,T), and the complex dielectric permittivity $^\sigma$ (ω,T) are measured as a function of temperature (100 K < T < 375 K) and at some selected frequencies (3 → 100 kHz). Two structural phase transitions are detected at T D (330 ± 1) K and T D (343 ± 1) K as minor and major transitions, respectively. The analysis of the measured electrical parameters reveals that the frequency-dependent conductivity obeys the power law, and the quantum mechanical tunneling (QMT) model is the main conduction mechanism in the low-temperature phase (LTP; phase III). The role of hydrogen bond NH. . .Cl as a trigger force for phase transitions has been discussed. While the LTP is of the orderdisorder type, the high-temperature phase (HTP) or phase I seems to be conformational and represents the main transition.

Keywords: Phase transition; Thermal energy storage materials; Electrical conductivity and permittivity; Thermal analysis.

404. Effect of Rare Earth Substitution on the Structural and Electrical Properties of Cu -Mg Ferrite

E. Ateia, M. A. Ahmed and R. M. Ghouniem

The samples of $Cu0.9Mg0.1R_yFe2_{-y}O_4$, where y = 0.01 and R=Sm, Dy, Ho and Hf, were prepared by standard ceramic method. All investigated samples were sintered at 1150^0C with a heating rate of 4^0C/min and sintering time of 8 h. X-ray diffraction study of the compositions revealed the formation of cubic spinel structure with the appearance of small peaks indicating the presence of secondary phases. Seebeck coefficient was obtained from thermo-electromotive force (emf) measurements. The alternation of the Seebeck coefficient sign between (+)ve and (-)ve means that the two conduction mechanisms take place simultaneously.

The dielectric parameters such as dielectric constant, quality factor were determined as a function of temperature and at different frequencies. The decrease in Fe^{3+} ions on the octahedral site decreased the polarization of the system, through the dielectric transition point.

Keywords: X-Ray diffraction; Dielectric properties; Rare earth Elements; Seebeck coefficient.

405. Ferroelectricity in A New Luminescent Organicinorganic Hybrid: $[CH_3(C_6H_5)_3P]_2MnBr_4$

Ahmad K. Tammam, Thanaa Sh. El-Dean and Mohga F. Mostafa

The material was synthesized, investigated by DSC, X-ray powder diffraction and impedance measurement. Ferroelectric activity was found below 310 K. The material crystallizes in a monoclinic system, space group $P2_1$ at TD 298 K, a = 9.623 A°, b = 12.565 A° , c D16.45 A° and β = 105.6°. Spontaneous polarization was estimated by Sawyer-Tower Bridge and measured by pyrocharge shows ferroelectricity. Permittivity shows a sharp frequency dependent peak with Curie temperature at 310 K.

Keywords: Ferroelectricity; Phase transition; Crystal structure; Dielectric permittivity.

406. Multiplicity and Entropy Scaling of Medium-Energy Protons Emitted in Relativistic Heavy-Ion Collisions

A. Abdelsalam, S. Kamel and M. E. Hafiz

The behavior and the properties of medium-energy protons with kinetic energies in the range 26 - 400 MeV is derived from measurements of the particle yields and spectra in the final state of relativistic heavy-ion collisions (^{16}O-AgBr interactions at 60 A and 200 A GeV and ^{32}S-AgBr interactions at 3.7 A and 200 A GeV) and their interpretation in terms of the higher order moments. The multiplicity distributions have been fitted well with the Gaussian distribution function. The data are also compared with the predictions of the modified FRITIOF model, showing that the FRITIOF model does not reproduce the trend and the magnitude of the data. Measurements of the ratio of the variance to the mean show that the production of target fragments at high energies cannot be considered as a statistically independent process. However, the deviation of each multiplicity distribution from a Poisson law provides evidence for correlations. The KNO scaling behavior of two types of scaling (Koba-Nielsen-Olesen (KNO) scaling and Hegyi scaling) functions in terms of the multiplicity distribution is investigated. A simplified universal function has been used in each scaling to display the experimental data. An examination of the relationship between the entropy, the average multiplicity, and the KNO function is performed. Entropy production and subsequent scaling in nucleus-nucleus collisions are carried out by analyzing the experimental data over a wide energy range (Dubna and SPS). Interestingly, the data points corresponding to various energies overlap and fall on a single curve, indicating the presence of a kind of entropy scaling.

Keywords: Nucleus-Nucleus Collisions;Target fragments; Multiplicity moments ; Multiplicity distributions ; Kno-scaling.

407. The Effect of Local and Non-Local Potentials on BCS Solutions for Some Even-Even Nuclei

H. M. Elsharkawy and M. Saleh Yousef

We study the like-particle pairings using the BCS approximation applied for di_erent eveneven nuclear isotopes using di_erent realistic potentials for the NN interaction. First we solve the SchrÖdinger equation using a deformed axially symmetric Woods-Saxon potential. For the pairing interaction the interaction G-matrix is calculated using local potentials (Argonne V18 and Nijmegen II) and non-local potentials (Bonn-CD and Nijmegen I). A study of the effect of these different realistic potentials on the pairing strengths, average pairing gaps, Fermi energies, and occupation probabilities of protons and neutrons is introduced. We find that the pairing strength values calculated by the local potentials are greater than that calculated by the non-local potentials. We find that only one of the BCS outputs, the pairing energy gap, is slightly affected by using different types of realistic potentials.

Keywords: Local potential;BCS; Realstic forces.

Dept. of Zoology

408. Positive Lymph-Node Breast Cancer Patients – Activation of NF-$_k$B in Tumor-Associated Leukocytes Stimulates Cytokine Secretion That Promotes Metastasis Via C-C Chemokine Receptor CCR7

Eslam A. El-Ghonaimy, Mohamed El-Shinawi, Sherif A. Ibrahim, Hisham El-Ghazaly, Reda Abd-El-Tawab, Mohamed A. Nouh, Tahani El-Mamlouk1 and Mona M. Mohamed

Tumor metastasis to lymph nodes is most deadly complication among breast cancer patients. Herein, we investigated the molecular mechanism by which tumor-associated leukocytes (TALs) mediate lymph node metastasis. The density of different leukocyte subtypes infiltrating the tumor microenvironment of negative and positive lymph nodes (nLNs, pLNs) in breast cancer patients was measured using immunohistochemistry. In addition, we isolated TALs from blood drained from the axillary tributaries of nLN and pLN patients during breast surgery. Secretions of TALs were subjected to cytokine profiling using a cytokine antibody array. Our results showed an increase in the number of infiltrated CD45+ cells in the carcinoma tissues of pLN patients with the major proportion being myeloid subsets compared with nLN patients. Furthermore, TALs of pLN patients show a significant fivefold increase in the secretion of interleukin (IL)-1α, interferon γ, IL-5, IL-3 and tumor necrosis factor β, and are characterized by enhanced constitutive NF-$_k$B/$_p$65 signaling compared with TALs isolated from nLN patients. Using an invasion assay, cytokines secreted by TALs of pLN patients were shown to augment the invasive phenotype of breast cancer MCF-7 and SKBR3 cells compared with nLN patients. Using flow cytometry, we found that C-C chemokine receptor 7 (CCR7) is significantly overexpressed in breast carcinoma of pLN patients compared with nLNs patients. Intriguingly, CCR7, a mechanistic clue for metastasis, is upregulated in MCF-7 cells upon stimulation with TAL-conditioned media of pLN patients. Our findings show that the molecular cues secreted by TALs alone or in combination with CCR7 may emerge as future therapeutic targets for lymph node metastasis in breast cancer patients.

Keywords: C chemokine receptor 7; NF-$_k$B; Breast cancer; Cytokines; Lymph nodes.

409. Infection of Female BWF1 Lupus Mice with Malaria Parasite Attenuates B Cell Autoreactivity by Modulating the CXCL12/CXCR4 Axis and its Downstream Signals PI3K/AKT, NF$_K$B and ERK

Gamal Badr, Ayat Sayed, Mostafa A. Abdel-Maksoud, Amany O. Mohamed, El-Azza Amir, Fathy A. Abdel-Ghaffar, Saleh Al-Quraishy and Mohamed H. Mahmoud

Systemic lupus erythematosus (SLE) is a prototypic autoimmune disease characterized by abnormal autoreactivity in B cells. Lymphocytes and their soluble mediators contribute to the disease pathogenesis. We recently demonstrated that infecting lupus mice with malaria confers protection against lupus nephritis by attenuating oxidative stress in both liver and kidney tissues. In the current study, we further investigated B cell autoreactivity in female BWF1 lupus mice after infection with either live or gamma-irradiated malaria, using ELISA, flow cytometry and Western blot analysis.
The lupus mice exhibited a significant elevation in plasma levels of IL-4, IL-6, IL-7, IL-12, IL-17, IFN-α, IFN-γ, TGF-β, BAFF and APRIL and a marked elevation of IgG2a, IgG3 and ant-dsDNA autoantibodies compared with normal healthy mice. Infecting lupus mice with live but not gamma-irradiated malaria parasite partially and significantly restored the levels of the soluble mediators that contribute to the progression of lupus. Furthermore, the B cells of lupus mice exhibited an increased proliferative capacity; aberrant overexpression of the chemokine receptor CXCR4; and a marked elevation in responsiveness to their cognate ligand (CXCL12) via aberrant activation of the PI3K/AKT, NFκB and ERK signaling pathways. Interestingly, infecting lupus mice with live but not gamma-irradiated malaria parasite restored a normal proliferative capacity, surface expression of CXCR4 and B cell response to CXCL-12. Taken together, our data present interesting findings that clarify, for the first time, the molecular mechanisms of how infection of lupus mice with malaria parasite controls B cell autoreactivity and thus confers protection against lupus severity.

410. Why the Radiation-Attenuated Cercarial Immunization Studies Failed to Guide the Road for An Effective Schistosomiasis Vaccine: A Review

Rashika El Ridi and Hatem Tallima

Schistosomula- and adult worms-derived antigens induce predominant Th1 immune responses.
The radiation-attenuated cercariae vaccine efficacy is dependent on induction of Th1 and Th2 immune responses. Accordingly, schistosomula- and adult worms-derived antigens used for effective vaccination must be combined with Th2 immune responses-inducing cytokines or molecules as adjuvant.
Keywords: Schistosoma; Vaccination; Radiation-attenuated Cercariae; Th1 and Th2 responses; Excretory; Secretory products; Cysteine peptidases.

411. Estimation of TiO$_2$ Nanoparticle-Induced Genotoxicity Persistence and Possible Chronic Gastritis-Induction in Mice

Hanan Ramadan Hamad Mohamed

Titanium dioxide (TiO$_2$) nanoparticles are widely used as a food additive and coloring agent in many consumer products however limited data is available on the nano-TiO$_2$ induced genotoxicity persistence. Thus, this study investigated the persistence of nano-TiO$_2$ induced genotoxicity and possible induction of chronic gastritis in mice. The mice were orally administered 5, 50 or 500 mg/kg body weight nano-TiO$_2$ for five consecutive days, and then mice from each dosage group were sacrificed 24 h or one or two weeks after the last treatment. The administration of nano-TiO$_2$ resulted in persistent apoptotic DNA fragmentation and mutations in p53 exons (5e8) as well as significant persistent elevations in malondialdehyde and nitric oxide levels and decreases in the reduced glutathione level and catalase activity compared with the control mice in a dose- and time-dependent manner. Necrosis and inflammation were evident upon histological examination. These findings could be attributed to the persistent accumulation of nano-TiO$_2$ at the tested doses at all three time points. Based on these findings, we conclude that the administration of nano-TiO2, even at low doses, leads to persistent accumulation of nano-TiO$_2$ in mice, resulting in persistent inflammation, apoptosis and oxidative stress, ultimately leading to the induction of chronic gastritis.
Keywords: TiO$_2$ Nanoparticles chronic gastritis genotoxicity P53 mice.

412. Assessment of Metal Contamination in Water, Sediment, and Tissues of Arius Thalassinus Fish from The Red Sea Coast of Yemen and the Potential Human Risk Assessment

Yousef S. Saleh and Mohamed-Assem S. Marie

Heavy metal pollution is one of the most serious environmental issues globally. To evaluate the metal pollution in the Red Sea coast of Hodeida, Yemen Republic, the concentrations of Fe, Cu, Ni, Pb, and Cd in water, sediment, and some vital organs of sea catfish, Arius thalassinus collected from polluted and unpolluted sites, were determined. The risk of these metals to humans through fish consumption was then assessed. The results showed that the concentration order of metals in water, sediment, and fish tissues were Fe>Cu>Ni> Pb>Cd. The levels of studied metals in water, sediment, and fish tissues were significantly higher in the polluted site than those of the unpolluted site, with few exceptions. Linear correlation incorporating paired variables (water-sediment, water-fish, and fish-fish) exhibited several significant correlations indicating a common metal pollution. The risk assessment performed revealed that fish consumption was safe for consumers. This field investigation provides a baseline data on metal pollution in this region.
Keywords: Heavymetal; Arius thalassinus; Red Sea; Risk assessment ; Pollution.

413. Efficacy and Safety of Arachidonic Acid for Treatment of School-Age Children in Schistosoma Mansoni High-Endemicity Regions

Rashida Barakat, Nadia E. Abou El-Ela, Soraya Sharaf, Ola El Sagheer, Sahar Selim, Hatem Tallima, Maaike J. Bruins, Kevin B. Hadley and Rashika El Ridi

Arachidonic acid (ARA), an omega-6 fatty acid, is a potent schistosomicide that displayed significant and safe therapeutic effects in Schistosoma mansoni-infected schoolchildren in S. mansoni low-prevalence regions. We here report on ARA efficacy and safety in treatment of schoolchildren in S. mansoni high-endemicity areas of Kafr El Sheikh, Egypt. The study was registered with ClinicalTrials.gov (NCT02144389). In total, 268 schoolchildren with light, moderate, or heavy S. mansoni infection were assigned to three study arms of 87, 91, and 90 children and received a single dose of 40 mg/kg praziquantel (PZQ), ARA (10 mg/kg per day for 15 days), or PZQ combined with ARA, respectively. The children were examined before and after treatment for stool parasite egg counts and blood biochemical, hematological, and immunological parameters. ARA, like PZQ, induced moderate cure rates (50% and 60%, respectively) in schoolchildren with light infection and modest cure rates (21% and 20%, respectively) in schoolchildren with high infection. PZQ and ARA combined elicited 83% and 78% cure rates in children with light and heavy infection, respectively. Biochemical and immunological profiles were either unchanged or ameliorated after ARA therapy. Combination of PZQ and ARA might be useful for treatment of children with schistosomiasis in high-endemicity regions.

Keywords: Arachidonic acid; Schistosoma mansoni.

414. Length of Tick Repellency Depends on Formulation of The Repellent Compound (Icaridin = Saltidin®): Tests on Ixodes Persulcatus and Ixodes Ricinus Placed on Hands and Clothes

Fathy Abdel-Ghaffar, Saleh Al-Quraishy and Heinz Mehlhorn

The present study had the aim to test the repellent potential of the compound icaridin = Saltidin® against the tick species Ixodes ricinus and Ixodes persulcatus using different formulations of the compound. Tests were done on backs of impregnated human hands, on impregnated linen cloth and versus impregnated dog hair. It was found that 1. Ixodes persulcatus—the common Eastern European, Russian Ixodes species is significantly sensitive to icaridin = Saltidin® as I. ricinus protecting for the test period of 5 h. This is an important finding, since I. persulcatus is the vector of agents of the severe Eastern meningoencephalitis; 2. that this repellent compound acts similarly on both I. ricinus and I. persulcatus, when sprayed either on naked skin or on cloths; 3. that there are only slight differences in duration of the repellency when using different formulations containing icaridin = Saltidin®; 4. that icaridin = Saltidin® sprayed on dog hair has identical repellent effects like those seen on human skin and cloths; thus, this compound can also be used to protect animals such as dogs, cats, horses; and 5. that the icaridin = Saltidin® did not induce a bad sensation on skin, nor bad smells; furthermore, it was not sticky and did not leave residuals neither on clothes nor on dog's hair.

Keywords: Tick repellents; Icaridin ; Saltidin; KBR3023 ; Effects of formulation.

415. Head Louse Control by Suffocation Due to Blocking Their Oxygen Uptake

Fathy Abdel Aty Abdel Ghaffar

The present study shows that head lice (Pediculus humanus capitis) are killed by suffocation when submersed into the anti-louse shampoo Licener®, which contains a mild shampoo component and an extract of neem seeds after their oil components had been pressed off. It is shown that the inner tracheal system becomes completely filled by the very fluid product. Within 3-10 min, oxygen uptake is prohibited and death of all thus treated lice stages occurred.

Keywords: Head lice . Pediculus humanus capitis ;Pediculosis . Louse control ; Public health ; Costs of lice control ; Efficacy of lice control.

416. Hysterothylacium Aduncum (Nematoda, Anisakidae) with A New Host Record from the Common Sole Solea Solea (Soleidae) and its Role as A Biological Indicator of Pollution.

Fathy Abdel-Ghaffar, Rewaida Abdel-Gaber, Abdel-Rahman Bashtar, Kareem Morsy, Heinz Mehlhorn, Saleh Al Quraishy and Rehab Saleh

Hysterothylacium aduncum (Nematoda, Anisakidae) was isolated from the intestine of the common sole Solea solea (Family, Soleidae) collected from coasts along Alexandria City at the Mediterranean Sea in Egypt, during the period from May to September 2013. Light and scanning electron microscopy revealed that this nematode parasite belongs to the family Anisakidae in the genus Hysterothylacium. The type species is named H. aduncum, based on the presence of three interlocked lips with the interlabium in between, the presence of cephalic papillae, and large numbers of caudal papillae in males. Body measurements showed that the male worms were smaller than females measuring 13.9-18 mm (16.2±0.2) in length and 0.26-0.34 mm (0.30±0.01) in width. Females measured 20.5-24.5 mm (22.7±0.2) in length and 0.41-0.52 mm (0.45±0.01) in width. The morphological characteristics of this species was confirmed by molecular analysis of 18S rDNA for these parasites followed by comparison between sequence data for them with those obtained from the Genbank showing that H. aduncum is deeply embedded in the genus Hysterothylacium with a sequence similarity between 95.5-94.3 % with close relationships to other H. aduncum specimens and Hysterothylacium sp.. Furthermore, it was shown that this parasitic nematode is able to accumulate larger concentrations of heavy metals such as Fe, Cu, Cd, and Ni within its tissues than of its host fish and thus it can be used as a useful bio-indicator of water pollution.

Keywords: Hysterothylacium aduncum; Anisakidae; Solea solea; Light and scanning electron microscopy; Biological indicator.

417. New Host Records of Three Juvenile Nematodes in Egypt: Anisakis Sp. (Type II), Hysterothylacium Patagonense (Anisakidae), and Echinocephalus Overstreeti (Gnathostomatidae) from the Greater Lizard Fish Saurida Undosquamis of the Red Sea.

Kareem Morsy, Abdel-Rahman Bashtar, Nesma Mostafa, Somaya El Deeb and Salwa Thabet

Three juvenile nematode parasites were collected naturally from 90 (75 %) out of 120 specimens of the marine greater lizard fish Saurida undosquamis captured from water coasts at Hurghada City along the Red Sea in Egypt during the period from September 2013 to April 2014. Worms were identified on the basis of light and scanning electron microscopy. Two of the recovered worms were isolated from the peritoneal cavity of the infected fish around the wall of the stomach as encapsulated larvae. The anisakid juvenile Anisakis sp. (Type II) was characterized by an anteroventrally triangular mouth, with a boring tooth; its postanal tail was rounded, without a terminal mucron or spine. The gnathostomatid Echinocephalus overstreeti was characterized by the presence of a cephalic bulb armed with six transverse rows of spines which were slightly more compact near the anterior end of bulb with maximal separation near the midbulb; the cephalic bulb terminated at a pseudolabia which situated dorsoventrally and reached its greatest width at the posterior one third of the body, The postanal tail terminated at a pointed mucron. The third juvenile species, Hysterothylacium patagonense (Anisakidae), was isolated from the intestine of the infected fish; they are characterized by a small-sized body with a conical tail provided by a nodulose apex, and the anterior end was equipped with three lips. A dorsal lip slightly smaller than the two subventrals left a deep postlabial groove and prominent lateral flanges in between, and the proximal part of each lip was smooth. The three described species were compared morphologically and morphometrically with some of the previously recorded species of the same genus. From this comparison, the similarity and variations between these species were described and concluded that the present study should be considered as a new host record in Egypt.

Keywords: Anisakis Sp; Hysterothylacium Patagonense; Anisakidae; Echinocephalus overstreeti; Saurida undosquamis; Gnathostomatidae ; Light and scanning microscopy.

418. Molecular Characterization and New Geographical Record of Lecithochirium Priacanthi (Digenea: Hemiuridae) Infecting the Moontail Bullseye Fish Priacanthus Hamrur (Perciformes: Priacanthidae) from the Red Sea, Egypt

Fathy Abdel-Ghaffar,Rewaida Abdel-Gaber,Abdel-Rahman Bashtar, Kareem Morsy, Saleh Al Quraishy, Rehab Saleh and Heinz Mehlhorn

Sixty specimens of the moontail bullseye Priacanthus hamrur were collected at Coasts of Suez Gulf, Red Sea (Egypt) during the four different seasons of the whole year 2014 and necropsied to study the infection with metazoan parasites. Twenty-one out of 60 examined fish specimens (infection rate of 33.33 %) were found

to be naturally infected by the hemiurid digenean parasite Lecithochirium priacanthi. The large-sized fish reaching 15–30 (23.5±4.8)cm were more intensively infected than the smaller ones. A definite seasonal effect was observed as winter was found to be the season of severe parasitic infections, while midsummer was the lowest one. The morphological and morphometric characterization of this parasite were examined by light and scanning electron microscopy. The adult worms had an elongated body measuring 1.93–2.54 (2.11±0.20)mm in length and 0.61–0.72 (0.67 ±0.02)mm in width. The body was characterized by the presence of a sub-terminal oral sucker with diameters reaching 0.12–0.16 (0.14±0.02)mm. The ventral sucker measured 0.32–0.45 (0.38±0.02)mm in diameter. The body was supplied by a short retracted portion with a blunt end that measured 0.48–0.61 (0.56±0.02)mm in length and 0.28–0.35 (0.32±0.02)mm in width. Morphological results of the present parasite were compared with other related species described previously from Perciformes. Molecular characterization based on small subunit ribosomal DNA was done to confirm the obtained morphological and morphometric results. A preliminary genetic comparison between SSU rDNA of this parasite and other species of Hemiuridae places the present specimen as a putative sister taxon to Lecithochirium grandiporum and Lecithochirium caesionis. The finding of L. priacanthi in Egyptian marine water fish represents a new geographical record for this parasite.

Keywords: Priacanthus hamrur fish; Hemiuridae; Lecithochirium species ;Morphology ; Phylogenetic analysis.

419. Testicular Myxosporidiasis and Ultrastructural Characteristics of Myxobolus Bufonis (Myxobolidae) Infecting the Egyptian Toad Bufo Regularis (Bufonidae). A Light and Electron Microscopic Study

Kareem Morsy, Margit Semmler,Ebtsam Al-Olayan and Heinz Mehlhorn

The phylum Myxozoa comprises more than 2180 species, almost all of which are considered to be obligate parasites of aquatic fishes and amphibians. They are dangerous pathogens responsible for severe economic losses. From March to September 2014, 40 adult male Bufo regularis (Bufonidae) captured from different areas at Giza province, Egypt, were surveyed for myxosporean parasitic infection. Of these, 22 (55 %) were infected by histozoic plasmodia, which produced spores after rupture belonging to Myxosporidia. The present investigation introduced a new data for the recorded parasite observed by light and transmission electron microscopy.

The infection was diagnosed as large clusters of macroscopic plasmodia embedded in the testicular tissue causing distortion at the site of infection. The host reaction was manifested by the encapsulation of the plasmodia with a thick layer of connective tissue. Plasmodia were whitish in color, elliptical to ovoid in shape measuring 0.54±0.2 (0.34–0.63) mm in diameter. The spores were subspherical, reaching 7.1± 0.2 (6.2–8.4) μm in length and 6.3±0.2 (5.8–7.0) μm inwidth with two equal-sized polar capsules regularly arranged at the anterior pole of each spore. They were 3.4±0.2 (3.0–4.2) μm in length and 1.9±0.2 (1.6–2.4) in width with 6–8 turns of polar filaments. Ultrastructural analysis showed that the plasmodia were surrounded by a plasma membrane with numerous projections

and pinocytotic channels extended toward the host cell. The generative cells and the different developmental stages were arranged at the periphery of the plasmodia while immature and mature spores were centrally arranged. Sporogenesis, capsulogenesis, valvogenesis, and spore maturation of the present parasite were also described.

Keywords: Myxosporidiasis; Bufo regularis;Myxobolus bufonis ultrastructure.

420. Twelve Myxosporean Species of the Family Myxobolidae Infecting Freshwater Fishes of the River Nile, Egypt, with the Description of four Novel Species

Fathy Abdel-Ghaffar, Kareem Morsy, Sahar EL-Ganainy, Manal Ahmed,Shams Gamal, Abdel-Rahman Bashtar, Saleh Al Quraishy and Heinz Mehlhorn

Myxosporidian parasites infecting fish are very dangerous parasites causing severe damage to a large number of economically important fishes especially in aquaculture. A survey of myxosporean parasites infecting four species of fishes from the River Nile in Egypt is conducted.

One hundred and ninety-five out of 316 fish specimens with a percentage of 61.7% were found to be naturally infected with these parasites. Light microscopic examination of different tissues revealed the presence of 12 myxosporean species belonging to the family Myxobolidae. Four of the identified species are novel and the other eight species are redescribed. Myxidium sp.nov. a coelozoic species inhabiting the gallbladder of Labeo niloticus with its mature spores float free in bile was detected. These spores possess a fusiform, straight, or slightly crescentic shape with less pointed ends and two equal polar capsules.

Three novel histozoic Myxobolus species infecting Oreochromis niloticus were identified. Myxobolus sp(1).nov. is a species inhabiting kidney tissue with ovoid spores exhibiting a small intercapsular appendix. Myxobolus sp(2).nov. and Myxobolus sp(3).nov. recovered from kidney and intestinal tissues. Spores of Myxobolus sp(2).nov. are elliptical in shape with an anterior end wider than posterior one.

Their two polar capsules are ovoid to pyriform occupied nearly the first third of the spore body. Spores of Myxobolus sp(3).nov. are broader than long with nearly rounded or ovoid two polar capsules. Eight species of the recovered myxosporean parasites are redescribed, Myxobolus niloticus Fahmy et al., 1971 from pectoral, dorsal, and tail fins of L. niloticus, Henneguya suprabranchiae Landsberg, 1987, and Henneguya branchialis Ashmawy et al., 1989 are recovered from the gills and suprabranchial organ of the catfish Clarias gariepinus, respectively, Myxobolus naffari Abdel-Ghaffar et al., 1998 and Myxobolus imami Ali et al., 2002 are found in the kidney of Barbus bynni and L. niloticus, Myxobolus caudatus Ali et al. & Parasitol Res (2002) from Tail fin of B. bynni, Myxobolus fomenai Abdel-Ghaffar et al., 2008 from kidney and intestinal tissues of O. niloticus, Thelohanellus niloticus Abdel-Ghaffar et al., 2012 are observed in the gills of L. niloticus.

Keywords: Myxosporea;Fish;Protozoa;Spores.

421. Cytokine Signature and Antibody-Mediated Response Against Fresh and Attenuated Anisakis Simplex (L3) Administration Into Wistar Rats: Implication for Anti-Allergic Reaction

Fathy Abdel-Ghaffar, Abeer Mahmoud Badr,Kareem Morsy, Samar Ebead, Somaya El Deeb, Saleh Al Quraishy and Heinz Mehlhorn

The third larval stage (L3) of Anisakis simplex (Anisakidae) is one of the zoonotic parasitic nematodes in the musculature and visceral organs of marine fishes belonging to family Moronidae. The consumption of these high-commercial-value fish is widespread in many countries around the Mediterranean Sea including Egypt. The presence of these larvae in fish muscles poses a potential consumer hazard due to the parasite's ability to cause anisakidosis. Forty-two out of 60 (70%) of the European seabass Dicentrarchus labrax were found to be naturally infected by L3 of A. simplex in the form of encapsulated juveniles in the fish musculature. Morphological examination of recovered parasites by light and scanning electron microscopy showed that, in general, all specimens examined closely resembled A. simplex (L3). To evaluate the allergenicity of this nematode, white blood cell count; levels of T helper 1 (Th1) [interferon (IFN)- γ and tumor necrosis factor (TNF)- α)], Th2 [IL-4, IL-5, and IL-6], and Th17 [IL-17] related cytokines; total IgE and IgG antibodies; and nitric oxide (NO) were measured in the plasma of Wistar rats sensitized by oral inoculation with fresh, frozen, and heat-treated A. simplex L3 or rats intraperitoneally injected with L3 crude extract. Rats sensitized with fresh and frozen L3 larvae produced significantly higher levels of IFN-γ, IL-5, IL-17, and total IgE as compared to control rats. Heat-treated larvae administration resulted in a significant rise of IFN-γ, TNF-α, IL-5, and total IgE in comparison to control rats. Intraperitoneal sensitizations enhanced release of IFN-γ, TNF-α, and total IgE. Oral sensitization led to a significant production of NO. Thereby, frozen or cooked larval L3 cannot inhibit the release of Th-related cytokines and IgE, which might impact on the overall anti-parasitic immunity.

Keywords: Cytokines;Anisakis simplex.

422. Anti-Fibrotic Effect of Holothuria Arenicola Extract Against Bile Duct Ligation in Rats

Sohair R Fahmy

Background: Holothuria arenicola is the most important and abundant sea cucumber species in the Mediterranean Sea on the Egyptian coast. The present study aims to assess the anti-oxidative and anticholestatic effects of the sea cucumber Holothuria arenicola extract (HaE) in a model of bile duct ligation in male albino rats.

Methods: Fifty four male Wistar albino rats were assigned into two main groups, the Sham-operated control and bile duct ligated (BDL) group. After 14 days of surgery, the animals of the group I (Sham control) received distilled water only for 7, 14 and 28 days. Second group (BDL group) was divided into 2 subgroups, animals of these subgroups treated for 7, 14 and 28 consecutive days as follow: subgroup I (BDL), rats of this subgroup

administered distilled water orally. Subgroup II (HaE), animals of this subgroup treated orally with HaE (200 mg/kg body weight). **Results:** The HaE revealed significant antifibrotic effect as evident by decreasing the levels of total conjugated and unconjugated bilirubin and the activities of serum aminotransferases (ASAT and ALAT) and alkaline phosphatase (ALP) as well as malondialdehyde (MDA) level, and increasing the serum albumin, glutathione reduced (GSH) levels. Treatment with HaE normalized the antioxidant enzyme, glutathione-S-transferase (GST), superoxide dismutase (SOD) and catalase (CAT) activities activities.

Conclusion: The present prospective study correlated the antifibrotic effect of HaE to its direct antioxidant effect that can be related to its contents of phenolic compounds specially chlorogenic acid, pyrogallol, rutin and coumaric acid.

Keywords: Holothuria arenicola; Antifibrotic; Antioxidant;Bile duct ligation; Cholestatic indices.

423. Holothuria Arenicola Extract Modulates Bile Duct Ligation -Induced Oxidative Stress in Rat Kidney

Sohair R Fahmy and Ayman S Mohamed

Acute Renal Failure (ARF) in patients with cirrhosis is one of the most frequently encountered complications of obstructive jaundice. Marine organisms from the Mediterranean Coast of Egypt are considered potential sources of bioactive molecules. The present study was undertaken to explore the curative effects of Holothuria arenicola extract (HaE) against renal injury induced by bile duct ligation in male albino rats. METHODS: Fifty four male Wistar albino rats were assigned into two main groups, the Sham-operated control (received distilled water only for 28 days) and bile duct ligated (BDL) group, which divided into 2 subgroups, animals of these subgroups treated for 28 consecutive days as follow: Subgroup I (BDL), rats of this subgroup administered distilled water orally. Subgroup II, animals of this subgroup treated orally with HaE (200 mg/kg body weight). RESULTS: BDL induced marked alteration on renal functions as manifested by a significant increase in the kidney function markers, serum creatinine, urea and uric acid. In addition, BDL caused significant increase in MDA level and significant decrease in GSH level as well as antioxidant enzymes activities (GST, SOD and CAT). However, administration of HaE for consecutive 28 days significantly reversed these changes, suggesting that the renal curative effect of HaE against oxidative stress- induced injury might be involved in decreasing lipid peroxide generation and stimulating antioxidant status. CONCLUSION: The present study revealed that HaE had a profound effect against BDL-induced oxidative stress in the kidney tissues which is the common feature of choestasis in the liver.

Keywords: Holothuria arenicola; Antioxidant; Bile duct ligation; Kidney function.

424. Anti-Neoplastic Activities of Sepia Officinalis Ink and Coelatura Aegyptiaca Extracts Against Ehrlich Ascites Carcinoma in Swiss Albino Mice

Amel M Soliman, Sohair R Fahmy and Salma A El-Abied

Objectives: With the development of sophisticated instruments for the isolation and elucidation of natural products structures from marine and freshwater organisms, major advances have been made in the discovery of aquatic derived therapeutics. Present investigations were carried out to evaluate cuttlefish (Sepia officinalis) ink extract (IE) and freshwater clam (Coelatura aegyptiaca) extract (CE) for their anticancer and antioxidant activities as compared to 5-flurouracil (5-Fu), in Ehrlich ascites carcinoma (EAC).

Methods: Sixty female Swiss albino mice were divided into five groups (n = 12). All groups except group I received EAC cells (5 × 106 cells/mouse i.p.) and this was taken as the 0th day. Group I served as saline control (5 ml/kg 0.9% NaCl w/v p.o). Group II served as EAC control. Rats of groups III, IV and V received IE, CE (200 mg/kg body weight i.p.), and reference drug (5-Fu, 20 mg/kg body weight i.p.), respectively.

Results: The reduction in tumor volume, packed cell volume, tumor cell counts and increase in median survival time and percentage increase in life span in treated animals were observed. There was a significant increase in RBC count; Hb content in treated animals and reduction in total WBC count. There was a significant decrease in AST, ALT, ALP and liver MDA levels and increase in GSH, SOD and NO levels were observed in all treated animals.

Conclusion: Both IE and CE were effective in inhibiting the tumor growth in ascitic tumor models. The biochemical, antioxidants and histopathological studies were also supported their antitumor properties.

Keywords: Sepia officinalis; Coelatura aegyptiaca; Ehrlich acsites carcinoma; Antitumor; Oxidative stress.

425. Possible Antiosteoporotic Mechanism of Cicer Arietinum Extract in Ovariectomized Rats.

Sohair R Fahmy, Amel M Soliman, Amany A Sayed and Mohamed Marzouk

Objective: The present study aimed to throw the light on the anti-osteoprotic mechanism of Cicer arietinum extract (CAE) seeds against ovariectomized (OVX) rats. METHODS: Seventy female rats were divided into two groups. The first group (14 rats/group) represented normal rats (Sham operated) while the second group (56 rats/group) underwent bilateral ovariectomy (OVX). After one week of recovery from ovariectomy surgery, the second group was randomly subdivided into 4 subgroups (14 rats/ each subgroup). The rats administered orally; distilled water (vehicle) (1st subgroup), Cicer arietinum extract (CAE) (500 or 1000 mg/kg body weight/day) (2nd and 3rd subgroups), alendronate (6.5 mg/kg mg/kg body weight) as a positive control one time/week (4th subgroup), daily for 10 weeks. RESULTS: The present study demonstrated that ovariectomy caused significant decrease in bone mineral; density (BMD) and content (BMC), Bone-specific alkaline phosphatase (BALP), calcium (Ca), phosphorus (P), parathyroid hormone (PTH) and calcitonin levels. Furthermore, ovariectomy induced significant elevation of tartrate-resistant acid phosphatase 5b (TRAP 5b) and receptor activator of nuclear factor (NF-kappa β) ligand (RANKL) concentration. Conversely, osteoprotegerin (OPG) and OPG/RANKL ratio were decreased following ovariectomy. The present work suggests that CAE has antiosteoporotic action against ovariectomy effects and its activity may results from its phytochemical and/or phytoestrogen

contents. CONCLUSION: The ongoing study speculates that the CAE exerts its action through regulation of RANK/RANKL/OPG system. As, CAE not only promotes osteoblast differentiation, but also up-regulates OPG and downregulates RANKL secretion in osteoblasts, subsequently prevents bone loss and osteoporosis.

Keywords: Cicer arietinum; Bone remodeling regulators; Bone resorption marker; Osteoporosis; Ovariectomy.

426. Bioaccumulation and Neurotoxicity of Dithiopyridine Herbicide in the Brain of Freshwater Fish, Cyprinus Carpio

Gamal Mohamed Morsy

Toxicology And Industrial Health, 31(12): 1116-1127 (2015) IF: 1.859

The freshwater carp, Cyprinus carpio, was exposed to 0.5 mg (30% of median lethal concentration (LC_{50})), 1.0 mg (60% of LC_{50}), and 1.6 mg (LC_{50}) of dithiopyridine herbicide per liter for acute (24 h) and 1/10 of LC50 (0.2 mg/L/day) for sublethal (1, 3, 7, 14, and 21 days) experiments. The herbicide bioaccumulation was significantly affected by the acute exposure levels and the experimental periods and was positively correlated with them. One-way analysis of variance revealed that the acute and sublethal exposure to the herbicide as well as the experimental periods caused significant reduction in the concentrations of catecholamines (dopamine (DA) and norepinephrine (NE)), elevation of acetylcholine (ACh), and was associated with a marked decrease in the activity of acetylcholinesterase (AChE). In comparison with the corresponding controls, most levels of the DA and NE and the activity of AChE were significantly decreased, whereas the concentration of ACh was markedly elevated, during acute and sublethal exposure. In the acute and sublethal experiments, the herbicide accumulated in the brain was inversely proportional to the levels of DA and NE and the activity of AChE but has a direct correlation with the concentration of ACh. In addition, the brain's AChE activity was negatively correlated with ACh content during the acute (r = - 0.94) and sublethal (r = - 0.78) experiments.

Keywords: Fish; Brain; Herbicide; Lethality percentiles; Acute, sublethal; Bioaccumulation; Dopamine; Norepinephrine.

427. The Effect of Bisphenol A on Some Oxidative Stress Parameters and Acetylcholinesterase Activity in the Heart of Male Albino Rats

Heba S. Aboul Ezz, Yasser A. Khadrawy and Iman M. Mourad

Cytotechnology, 67: 145-155 (2015) IF: 1.752

Bisphenol A (BPA) is an endocrine disrupting chemical used on a wide range in industry. Several studies reported that BPA may cause cardiovascular disorders in humans and animals. The present study aims to investigate the effect of BPA on the heart of adult male rats. The rats received a daily oral administration of BPA (25 mg/kg for 6 weeks and 10 mg/kg for 6 and 10 weeks). It was found that BPA at the two studied doses induced a significant increase in malondialdehyde, and a significant decrease in catalase after 6 weeks. Moreover, a significant decrease in reduced glutathione and acetylcholinesterase (AchE) activity was observed after treatment with the two doses of BPA throughout the studied time intervals. The two doses (25 and 10 mg/kg)

resulted in a significant decrease in nitric oxide (NO) levels after 6 and 10 weeks, respectively. A significant increase in body weight gain occurred in all animals after BPA treatment. These results suggest that BPA has cardiotoxic effects which are mediated by the oxidative stress resulting from the overproduction of free radicals, the deficiency of NO and the inhibition of AchE leading to cholinergic activation. The obesity promoting effect of BPA may also participate in the observed cardiovascular disturbances.

Keywords: Bisphenol a; Heart;Oxidative stress; Acetylcholinesterase; Body weight-rat.

428. Antioxidant Effect of Sepia Ink Extract on Extrahepatic Cholestasis Induced by Bile Duct Ligation in Rats

Saleh H, Soliman AM, Mohamed AS and Marie MA

Biomedical And Environmental Sciences, 28(8): 582-594 (2015) IF: 1.653

Objective: The aim of our study was to assess the complications of hepatic fibrosis associated with bile duct ligation and the potential curative role of sepia ink extract in hepatic damage induced by bile duct ligation.
Methods: Rattus norvegicus rats were divided into 3 groups: Sham-operated group, model rats that underwent common bile duct ligation (BDL), and BDL rats treated orally with sepia ink extract (200 mg/kg body weight) for 7, 14, and 28 d after BDL.
Results: There was a significant reduction in hepatic enzymes, ALP, GGT, bilirubin levels, and oxidative stress in the BDL group after treatment with sepia ink extract. Collagen deposition reduced after sepia ink extract treatment as compared to BDL groups, suggesting that the liver was repaired. Histopathological examination of liver treated with sepia ink extract showed moderate degeneration in the hepatic architecture and mild degeneration in hepatocytes as compared to BDL groups.
Conclusion Sepia ink extract provides a curative effect and an antioxidant capacity on BDL rats and could ameliorate the complications of liver cholestasis.

Keywords: Bile duct ligation; Hepatic fibrosis; Oxidative stress; Liver collagen percentage; Histopathological examination.

429. Evaluation of Echinostoma Liei Worm, Metacercaria and Redia Antigens for Schistosomiasis Control

G. Abdel-Monaem, A. Farid and I. Rabia and A. El-Amir

Experimental Parasitology, 157: 23-29 (2015) IF: 1.638

While chemotherepeutic drugs, such as praziquantel, oxamniquine and metrifonate, are currently considered safe and effective drugs for schistosomiasis treatment, reinfection occurs frequently after drug treatment. Thus, a vaccine is sought to provide long-term treatment. Antigens from worm, metacercaria and redia of Echinostoma liei (E. liei) were purified using CNBr-activated Sepharose column, then used for immunization of mice prior to infection with Schistosomiasis mansoni. Worm burden, hepatic and intestinal eggs and oogram count was significantly reduced and that was reflected in normalization of liver architecture. This referred to a significant increase in the tested immunoglobulin level (IgM, IgG1 and IgG2).

430. Protective and Curative Effects of the Sea Cucumber Holothuria Atra Extract Against DMBA-Induced Hepatorenal Diseases in Rats

Ahmed I. Dakrory, Sohair R. Fahmy, Amel M. Soliman, Ayman S.Mohamed and Sayed A. M. Amer

Oxidative stress is a common mechanism contributing to the initiation and progression of hepatic damage. Hence there is a great demand for the development of agents with potent antioxidant effect. The aim of the present study is to evaluate the efficacy of Holothuria atra extract (HaE) as an antioxidant against 7,12-dimethylbenz[a]anthracene- (DMBA-) induced hepatorenal dysfunction. Experimental animals were divided into two main groups: protective and curative. Each group was then divided into five subgroups pre- or posttreated either with distilled water (DMBA subgroups) or with HaE (200mg/kg body weight) for seven and fourteen days. Single oral administration of DMBA (15mg/kg body weight) to Wistar rats resulted in a significant increase in the serum liver enzymes and kidney function's parameters. DMBA increased level of liver malondialdehyde (MDA), decreased levels of reduced glutathione (GSH), glutathione-S-transferase (GST), superoxide dismutase (SOD), and catalase (CAT) in the liver tissue, and induced liver histopathological alterations. Pre- or posttreatment with HaE orally for 14 days significantly reversed the hepatorenal alterations induced following DMBA administration. In conclusion,HaE exhibits good hepatoprotective, curative, and antioxidant potential against DMBA-induced hepatorenal dysfunction in rats that might be due to decreased free radical generation.

Keywords: Oxidative stress; Holothuria atra Extract; 7,12-Dimethylbenz[A]Anthracene.

431. Serological Tumor Markers of Hepatocellular Carcinoma: A Meta-Analysis

Tarek D. Hussein

Background: The clinical value of serum a-fetoprotein (AFP) to detect hepatocellular carcinoma (HCC) has been questioned due to its low sensitivity and specificity. Other than AFP, several new serum biomarkers including glypican-3 (GPC3), des- γ- carboxy prothrombin (DCP), a-L-fucosidase enzyme (AFU) and vascular endothelial growth factor (VEGF) have been identified as useful HCC markers.
Material and methods: A systematic search on PubMed, Web of Science and others was performed. Twenty-six case-control studies on HCC-related biomarkers published from 2000 to 2014 were included in this analysis. Data on sensitivity and specificity of tests were extracted and analyzed using the Meta-DiSc 1.4 statistical program. Fixed or random-effects models were used depending on the absence or presence of significant heterogeneity. Summary receiver operating characteristic (sROC)

curves were obtained to evaluate the accuracy of the studied markers.
Results: The areas under the sROC curve of AFP, GPC3, DCP, AFU, VEGF and the combination of each of the last 4 markers with AFP were 0.869, 0.928, 0.832, 0.851, 0.834, 0.964, 0.972, 0.873 and 0.948, respectively. A combination of AFP+GPC3, AFP+DCP or AFP+VEGF was superior to AFP alone in detecting HCC. The area under the sROC curve of GPC3 alone was significantly higher than that of AFP, whereas the areas of DCP, AFU and VEGF were comparable to that of AFP.
Conclusions: GPC3, DCP, AFU and VEGF are suitable markers for HCC, and their determination with AFP may prove to be useful in the diagnosis and screening of HCC.
Keywords: Biomarkers; Early detection; Hepatocellular carcinoma; Meta-analysis.

432. Redescription of Raillietiella Aegypti (Pentastomida: Cephalobaenida) Infecting the Lung of the Berber Skink Eumeces Schneideri (Scincidae) in Egypt. A New Data on the Basis of Light and Scanning Electron Microscopic Study

Fathy Abdel-Ghaffar, Amira Kamal Ahmed, Kareem Morsy and Rowida Helmy

In the present study, Raillietiella aegypti, a cephalobaenid pentastomid parasite infecting the lung of the berber skink Eumeces schneideri (Scincidae) was redescribed. New morphological and morphometric data based on light and scanning electron microscopic studies was recorded. Twenty specimens of the host animals were collected from desert lands of South Sinai, Egypt and examined for pentasomid infection. Only eight specimens (40%) were infected. All of the recovered parasites were adults, possessed small broadly triangular and pyramidal cephalothorax flattened on the ventral surface and merged smoothly with a uniformly thick and squat abdomen and terminated at a pair of parapodial lobes. The results obtained indicated that the parasite belongs to the sharp-tipped posterior-hook species which separated from the other raillietiedids of the same group through some important characteristic features including the annulus number, the shape and dimensions of the baccal cadre, copulatory spicules, anterior and posterior hooks. The anterior hook of the female specimens (n=3) had a blade length (AB) of 110-134 (120 ± 2) µm and shank length (BC) 119-182 (150 ± 2) µm while the posterior hook was much larger with AB measured 220-226 (240 ± 2) µm and BC was 350-370 (360 ± 2) µm. For the male specimens (n=3), the anterior hook was with AB 90-102 (98± 2) µm and BC 110-160 (140 ± 2) µm. The posterior hook was much larger with AB 190-216 (200 ± 2) µm and BC 230-249 (240 ± 2) µm. Comparison between the present species and other previously recoded raillietiedids concluded that the current species was similar only to R. aegypti recorded from the same host. The previous study described this species was incomplete and missed some important measurments and micrographs which introduced and completed in the present study.
Keywords: Pentastomids; Raillietiella aegypti; Cephalobaenida; Eumeces schneideri; Light and scanning electron microscopic study.

433. Antioxidant Responses and Nuclear Deformations in Freshwater Fish, Oreochromis Niloticus, Facing Degraded Environmental Conditions

Amr Adel Abdel-Khalek

Bull Environ Contam Toxicol, 94: 701-708 (2015) IF: 1.255

Two sites of collection along river Nile, nearby metal-related factories (site2) and 7 km downstream (site3) were compared to unpolluted reference fish farm (site1). Metals concentration (Cu, Zn, Pb, Fe, Mn and Cd) in water and sediment samples showed highly significant (p < 0.01) differences among sites. According to contamination factor and pollution load index values, overall pollution was ordered as site2 > site3 > site1. Compared with Oreochromis niloticus of site1, activities of superoxide dismutase, catalase and glutathione-S-transferase as well as malondialdehyde formation were significantly (p < 0.01) increased in both liver and gills of fish collected from metal contaminated sites. This increment showed a tissue-specific pattern with higher rate of increment in liver than in gills. While reduced glutathione level was sharply decreased in site2 and site3. Micronucleus test was assessed as an environmental genotoxic endpoint in erythrocytes. Assessment of eight nuclear deformations showed gradient frequencies related to the distance from the industrial discharges.
Keywords: Antioxidant Biomarkers;Metal Toxicity;Nuclear Anomalies.

434. Risk Assessment, Bioaccumulation of Metals and Histopathological Alterations in Nile Tilapia (Oreochromis Niloticus) Facing Degraded Aquatic Conditions

Amr A. Abdel-Khalek

Bull Environ Contam Toxicol, 94: 77-83 (2015) IF: 1.255

Two sampling sites contaminated with high aqueous metal concentrations in the vicinity of metal-related factories (site2) and 7 km downstream (site3) were selected along river Nile. These sites were compared to reference fish farm (site1) that fed on unpolluted water source. Bioaccumulation of metals (Cu, Zn, Pb, Fe, Mn and Cd) in Oreochromis niloticus showed a tissue-specific pattern with high rate of accumulation in gills, liver and kidney. The lowest concentrations of almost all metals were observed in muscle. The accumulated pattern was confirmed by histopathological examination of gills, liver and kidneys. Tissues from site2 and 3 revealed various histopathological alterations ranging from compensatory histological changes to histological damage. Evaluation of human health hazard using metals hazard index values in skin and muscle showed that all metals were in the safe limits for human intake except in the case of zinc and cadmium in skin at subsistence consumption level.
Keywords: Metals Accumulation;Histopathology;Risk Assessment.

435. Novel IMB-ELISA Assay For Rapid Diagnosis of Human Toxoplasmosis Using SAG1 Antigen

Shereen Hegazy, Alyaa Farid, Ibrahim Rabae and Azza El-Amir

Jpn. J. Infect. Dis., 68: 474-480 (2015) IF: 1.161

Nanotechnology is important for medical diagnosis. Various nanoparticles have presented tremendous potential for diagnosing disease markers, pre-cancerous cells, fragment of viruses, specific proteins, antibodies, and other disease indicators. In general, nanoparticles are smaller than 1,000 nm and produced from different materials in different shapes such as spheres, rods, wires, and tubes. Our study aimed to develop a novel antigen-capture immunoassay based on IgG polyclonal antibody-coated magnetic microbead nanoparticles for the rapid detection of circulating surface antigen 1 of Toxoplasma gondii in human serum samples. Sandwich ELISA elicited a sensitivity of 92%, a specificity of 92.7%, a positive predictive value (PPV) of 92%, and a negative predictive value (NPV) of 92.7%. Immunomagnetic bead-ELISA showed sensitivity (98%), specificity (96.4%), PPV (96%), and NPV (98.1%) higher than that of sandwich ELISA. It is obvious that the use of magnetic microbead nanoparticles offers the potential advantage of improving the diagnostic testing of toxoplasmosis.
Keywords: IMB-ELISA; Diagnosis; Toxoplasmosis; SAG1.

436. Aspicularis Tetrapetra (Nematode, Heteroxynematidae) of Laboratory Mice Mus Musculus (Rodentia, Muridae): A Potential Risk of Zoonotic Infection for Researchers

Rewaida Abdel-Gaber and Mona Fol

Ciência E Técnica Vitivinicola, 30: 125-136 (2015) IF: 0.368

This parasitological study was carried out during the period of January to November 2014 to investigate the helminth parasites infecting the laboratory mice in the Animal House at Cairo University, Egypt; in addition, to provide awareness for researchers to prevent the possible transmission of parasitic zoonosis from laboratory animals. The prevalence of Aspiculuris tetraptera in Mus musculus was 66%. The extent of infection with A. tetraptera is analyzed according to the sex of the host mice. It is shown that the prevalence of infection was greater in male than in female mice. Morphological and morphometric characterizations for the present parasite species revealed that it possess four distinct cephalic papillae lying on the cephalic plate and three small rudimental lips that carry two sessile poorly developed labial papillae with little differences in measurements with other Aspiculuris species.
Keywords: Laboratory Mice; Oxyurids; Aspicularis species; Morphological description.

437. New Geographical Record of Orientocreadium Batrachoides (Digenea, Orientocreadiidae) of African Sharptooth Catfish Clarias Gariepinus in Egyptian Water

Rewaida Abdel-Gaber, Kareem Morsy, Fathy Abdel-Ghaffar, Abdel-Rahman Bashtar and Rehab Saleh

Ciência E Técnica Vitivinicola, 30: 140-145 (2015) IF: 0.368

African sharptooth catfish, Clarias gariepinus, is one of the most important fish species for aquaculture purposes. Parasitological investigation was carried out during the period of February and December 2014 to study the prevalence of digenea parasites in the gastrointestinal tract of C. gariepinus. A total of 120 fish

specimen were collected alive from Lake Manzala, Dakahlia Governorate, Egypt.

One parasite species was recovered and identified as Orientocreadium batrachoides with 45.83% as a prevalence of infection. Morphological and morphometric analyses showed that the present parasite species resembles that of other O. batrachoides described previously with the dimensions of body more or less similar. In addition, there were positive correlations between fish length, weight and parasite abundance per fish. The prevalence of infection was greater in larger fish specimen than smaller ones.

Keywords: Orientocreadium batrachoides; Catfish; Clarias gariepinus; Lake manzala; Egypt.

438. Genetic and Biochemical Diversity Between Two Natural Populations of Tarentola Annularis Inhabiting Two Different Habitats in Egypt

Mohamed A.M. Kadry

polyacrylamide gel electrophoreses (Discontinuous) for lactate dehydrogenase (Ldh) and Alfaesterase (a-Est) isoenzymes were conducted for biochemical variability between two natural populations of the four-spotted gecko, Tarentola annularis inhabiting El-Faiyum and El-Beheira governorates, Egypt respectively.

Total lipids and total protein of liver and muscle tissues in both populations were also estimated. Five Ldh isoforms in liver tissues were recorded in both populations. T. annularis inhabiting El-Beheira showed a higher activity of Ldhs isoforms than that inhabiting El-Faiyum. Such higher activity was reflected in the thicker and denser bands as well as their high relative fronts (RF) and could be supported by the significant increase in the total lipids and total protein in liver and thigh muscle tissues of this population. Thus, T. annularis inhabiting El-Beheira is more active, energetic and adaptable in its natural habitat than that inhabiting El-Faiyum. a-Est in heart tissues showed five isozymic fractions in two samples of T. annularis inhabiting El-Faiyum and five isoforms in three samples of such population inhabiting El-Beheira. Heterozygosity for allozyme loci was observed only in a-Est-5 in T. annularis inhabiting El-Faiyum, while it was absent in such population that inhabiting El-Beheira.

The presence of such high activity of esterase isoforms as well as heterozygosity for allozyme locus; a- Est-5 in T. annularis inhabiting El-Faiyum may reflect to some extent, the genetic variability and the unsafety of the diet applied to this natural population of gecko, as well as their high ability to accumulate the environmental contaminants in their body tissues than that inhabiting El-Beheira. Thus, the highly polluted natural habitat of El-Faiyum threatens the persistence of the wild natural population of T. annularis and this was confirmed by increasing the damage of its DNA that decreases its genomic stability.

As a measure of the conservation status, we proposed a Red spot for the natural population of T. annularis inhabiting El-Faiyum based on the above mentioned data

Keywords: Tarentola annularis; Gekkonidae;LDH Isoenzyme; EST Isoenzyme; Total Lipids; Total protein.

439. Study of Genomic Dna Damage in Four-Spotted Gecko Tarentola Annularis One Species Inhabiting Two Different Habitats

Hanan R.H. Mohamed and Mohamed A. Kadry

The genus Tarentola is widely distributed; lives mainly in arid and semi-arid habitats and comprises 21 species with low inter-specific morphological variations. However, polluted habitats damage DNA and changes the genetic materials of living organisms that threaten the persistence of animal populations and affect on individuals, populations, genetic diversity and ultimately ecosystem biodiversity. Therefore, our study was aimed to assess the DNA damage level in two natural populations of Tarentola annularis inhabiting two different habitats in Egypt; El-Faiyum and El-Beheira. Comet assay was used to assess single and double strand breaks and Laddered DNA fragmentation assay was used to study the DNA fragmentation on agarose gel stained using ethidium bromide. A higher DNA damage level in the natural population of T. annularis inhabiting El-Faiyum compared with that inhabiting El Beheira was revealed by higher strand breaks and fragmentation pattern. Thus, we concluded that the highly polluted natural habitat of El-Faiyum threatens the persistence of the wild natural population of T. annularis by increasing the damage of its DNA that decreases its genomic stability. As the pollution threatens animal populations' persistence and ultimately affect on ecosystem biodiversity, we recommended to protect provide suitable protections to the natural population of T. annularis inhabiting El-Faiyum by placing them in nature reserves to protect it from the destructive human activities.

Keywords: Genetic diversity; DNA damage; Comet assay; Laddered DNA fragmentation; Tarentola annularis; El-Faiyum and El-Beheira.

440. Early Embryonic Development of the Harderian Gland of the Common Quail (Coturnix Coturnix)

E. Y. Salah El-Din and A. I. Dakrory

The present research aimed at giving a special focus on the early development of the Harderian gland – the principal orbital gland in birds. The development of the Harderian gland was studied in the common quail (Coturnix coturnix) at 7, 8, 9 and 10 days of incubation. The Harderian gland started its development as a long tube with a narrow lumen proximally and undifferentiated lumen distally at the seventh day of incubation, while at the eighth day of incubation, the studied gland differentiated into: the upper group formed from five opened tubules but the lower one consisted of three relatively closed tubules; the Harderian gland attained a strap-like appearance with hour-glass major borders, an increase in number of acini which share in formation of gland and its corresponding closed duct at the ninth day of incubation. More additional acini shared in formation of the Harderian gland. The tubular wide opened Harderian gland duct has appeared. Innervation of the Harderian gland was carried by the inferior ramus of oculomotor nerve at tenth day of incubation.

Keywords: Coturnix coturnix; Development; Harderian gland.

441. Holothuria Arenicola as A New Antiseptic Drug: in Vitro Antibacterial Investigation and in Vivo Therapeutic Role

Sohair R Fahmy, Amel M Soliman, Amany A Sayed and Maha Y Abd Al Shakour

Sepsis is a fatal response accompanied by a severe bacterial infection caused by contamination. This study evaluates the antibacterial effect of the Holothuria arenicola (body wall and coelomic fluid extracts) in vitro, and explored its therapeutic potential in septic rats induced by cecal ligation and puncture (CLP) in vivo. The phytochemical investigations of the both extracts revealed the availability of bioactive metabolites; including alkaloids, flavonoids, tannins, phenolic compounds and protein. In the in vivo study, rats were divided into 4 groups (6 rats/group): shamoperated, CLP, H. arenicola body wall extract (200 mg/kg b.wt) and H. arenicola coelomic fluid (200 mg/kg b.wt). The treatment starts two hours after the CLP induction and remains for 3 days. The survival study was performed for another 24 rats. Sepsis induced significant increase in procalcitonin and some hematological disorders such as erthyropenia, leukocytosis and thrombocytopenia. Both extracts of H. arenicola restored the procalcitonin and the hematological parameters near the control level. The effective antiseptic effect of the extracts backed to their bactericidal efficacy against the particular septic bacteria and attributed to their active antibacterial constitutes. Thus, the obtained results suggest that marine echinoderms are a potential source for the discovery of novel antibiotics

Keywords: Sepsis; Procalcitonin; Holothuria arenicola extracts; Hematological parameters.

442. Protective Effect of L-Carnitine and Baker Yeast Saccharomyces Cerevisiae Against Hepatic Toxicity Induced by Valproate as Antiepileptic Drug in Rats

Shebl Shaalan, Amany S. E El-Wakkad, Hanan Saleh and Afaf Deab

Objective: The aim of this work was to investigate the protective role of L-carnitine and baker yeast (Saccharomyces cerevisiae) against the effect of sodium valproate (VPA) induced toxicity and oxidative stress in the liver.

Methods: Chronic administration of sodium valproate was studied by oral administration of VPA for six months. The protective effect was conducted by an administration of L-carnitine or/and baker yeast for one month before chronic administration of VPA. Some biochemical parameters, lipid profile, oxidative stress and histopathological studies were analyzed.

Results: Chronic administration of VPA for six months caused a significant increase in serum amino transferases (AST, ALT), alkaline phosphatase (ALP), bilirubin, total lipids, total cholesterol, low density lipoprotein (LDL) as well as oxidative stress; malodialdehyde (MDA) and nitric oxide. While decreased total protein, albumin, and globulin in addition to glutathione peroxidase and superoxide dismutase (SOD). The administration of L-carnitine and baker yeast cause significant decreases in the activities of AST, ALT, bilirubin, lipid peroxidation, LDL level and MDA levels and return the levels of total protein, albumin, globulin, glutathione peroxidase and SOD to the normal levels. Histopathological results revealed improvement of the liver structure.

Conclusion: L-carnitine and baker yeast (Saccharomyces cerevisiae) offer protection to the liver by preserving the structural integrity of hepatocellular membrane against sodium valproate induced hepatotoxicity and oxidative stress.

Keywords: Sodium valproate; Baker yeast (saccharomyces cerevisiae); L-carnitine; Oxidative stress; Liver function.

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Dept. of Agricultural Biochemistry Section

443. Spectroscopic, Thermodynamic, Kinetic Studies and Oxidase / Antioxidant Biomimetic Catalytic Activities of Tris (3,5-Dimethylpyrazolyl) Borate Cu(Ii) Complexes

Shaban Y. Shaban, Abd El-Motaleb M. Ramadan, Mohamed M. Ibrahim, Mahmoud A. Mohamed and Rudi van Eldik

A series of copper (II) complexes, viz. $[Tp^{MeMe}Cu(Cl)(H_2O)]$ (1), $[Tp^{MeMe}Cu(OAc)(H_2O)]$ (2), $[Tp^{MeMe}Cu(NO_3)]$ (3) and $[Tp^{MeMe}Cu(ClO_4)]$ (4) containing tris (3,5- dimethylpyrazolyl) borate (KTp^{MeMe}), have been synthesized and fully characterized. The substitution reaction of 1 with thiourea was studied under pseudofirst- order conditions as a function of concentration, temperature and pressure in methanol and acetonitrile as solvents. Two reaction steps that both depended on the nucleophile concentration were observed for both solvents. Substitution of coordinated methanol is about 40 times faster than the substitution of chloride. In acetonitrile, the rate constant for the displacement of coordinated acetonitrile was more than 20 times faster than the substitution of chloride. The reported activation parameters indicate that both reaction steps follow a dissociative mechanism in both solvents. On going from methanol to acetonitrile, the rate constant for the displacement of the solvent becomes more than 200 times faster due to the more labile acetonitrile, but the substitution mechanism remained to have a dissociative character. The antioxidant activities of 1–4 were evaluated for superoxide dismutase (SOD), glutathione-stransferase (GST0 and glutathione reduced (GSH-Rd) activity. 1 and 2 were found to show ($p < 0.05$) the highest antioxidant activity in comparison to 3 and 4, which can be ascribed to the geometric configuration as well as the nature of the co-ligand. 1 showed catechol oxidase activity with turnover numbers of 20 min-1 and a coordination affinity for 3,5-DTBC of K1, = 31 mM-1. K_1 is rather large and seems to be typical for faster biomimetic models, and also for the enzyme itself ($25 mM^{-1}$). The reaction rate depended linearly on the complex concentration, indicating a first-order dependence on the catalyst concentration.
Keywords: Spectroscopic; Thermodynamic;Kinetic studies; Oxidase / Antioxidant; Biomimetic catalytic activities of tris (3,5-Dimethylpyrazolyl) borate Cu(Ii) complexes.

444. Physico-Chemical Properties of Biodiesel Manufactured from Waste Frying Oil Using Domestic Adsorbents

Samir Abd-Elmonem A Ismail and Rehab Farouk M Ali

We have evaluated the efficiency of sugar cane bagasse ash (SCBA), date palm seed carbon (DPSC), and rice husk ash (RHA) as natural adsorbents and compared them with the synthetic adsorbent Magnesol XL for improving the quality of waste frying oil (WFO) and for the impact on the physicochemical properties of the obtained biodiesel. We measured moisture content, refractive index (RI), density, acid value (AV), iodine value (IV), peroxide value (PV), and saponification value (SV), as well as fatty acid profile. Purification treatments with various levels of adsorbents caused significant ($P\leq 0.05$) decreases in free fatty acids (FFAs), PVs, and IVs. The highest yields (86.45 and 87.80%) were observed for biodiesel samples produced from WFO treated with 2% Magnesol and 3% of RHA, respectively, followed by samples treated with 2 and 3% of DPSC or RHA. Pre-treatments caused a significant decrease in the content of C 18:2 linoleic acids, consistent with a significant increase in the content of monounsaturated and saturated fatty acids (MUFA) in the treated samples. The highest oxidation value (COX) (1.30) was observed for biodiesel samples produced from WFO without purification treatments. However, the lowest values (0.44–0.73) were observed for biodiesel samples produced from WFO treated with different levels of adsorbents. Our results indicate that pre-treatments with different levels of adsorbents regenerated the quality of WFO and improved the quality of the obtained biodiesel.
Keywords:Adsorbents; Filter; Transesterification; Biodiesel characteristics; Waste frying oil; Cox value.

445. A Promising Anti-Cancer and Anti-Oxidant Agents Based on the Pyrrole and Fused Pyrrole: Synthesis, Docking Studies and Biological Evaluation

Samar Said Fatahala, Emad Ahmed Shalaby, Shaymaa Emam Kassab and Mossad Said Mohamed

A series of N-aryl derivatives of pyrrole and its related derivatives of fused form (namely; tetrahydroindole and dihydroindenopyrroles) were prepared in fair to good yields . The newly synthesized compounds were confirmed using IR, ^{1}H NMR, Mass spectral and elemental analysis. Tetrahydrobenzo[b] pyrroles Ia-d, 1,4-dihydroindeno[1,2-b]pyrroles IIa,b and pyrroles IIIa-c,e were evaluated for anticancer activity, coinciding with the antioxidant activity; using Di-Phenyl Picryl Hydrazyl (DPPH) tests. The cytotoxicity of the tested compounds (at a concentration of 100 and 200 µg /mL) was performed against HepG-2 and EACC cell lines. Compounds Ib, d and IIa showed promising antioxidant activity beside their anticancer activity. Docking studies were employed to justify the promising anticancer activity of Ib,d and IIa. Protein kinase (PKase)-PDB entry 1FCQ was chosen as target enzyme for this purpose using the MOLSOFT ICM 3.4-8C program. The docking results of the tested compounds went aligned with the respective anticancer assay results.
Keywords: Anticancer; Antioxidant; Docking; Pyrrole; Structure-activity-relationship; Synthesis.

446. Study of Chemical Bonding, Physical and Biological Effect of Metformin Drug as an Organized Medicine for Diabetes Patients with Chromium(III) and Vanadium(IV) Ions

Abdel Majid A. Adam, T. Sharshar, Mahmoud A. Mohamed, Omar B. Ibrahim and Moamen S. Refat

New vanadium(IV) and chromium(III) complexes of metformin (MFN) were synthesized upon the chemical interaction between vanadyl(II) sulfate monohydrate or chromium(III) chloride hexahydrate with metformin diabetic drug in the media of a pure grade of methanol solvent. The $[(VO)_2(MFN)_2(SO_4)2]_2H_2O$ and $[Cr(MFN)_3]$ Cl_36H_2O complexes were discussed using microanalytical measurements, molar conductance, spectroscopic (infrared, ESR, XRD, and UV–vis), effective magnetic moment, scanning electron microscopy (SEM), and thermal analyses (TG/DTG). The elemental analysis shows that VO(II) and Cr(III) complexes were associated with 1:1 and 1:3 M ratios, respectively. The infrared spectroscopic results data received from the comparison between free MFN free ligand and their vanadyl(II) and chromium(III) complexes were proven that metformin reacted with respected metal ions as a bidentate ligand through its two imino groups. The kinetic thermodynamic parameters were estimated from the DTG curves. The microstructure changes of the VO(II) and Cr(III) complexes have been probed using positron annihilation lifetime (PAL) and positron annihilation Doppler broadening (PADB) techniques. The PAL and PADB line-shape parameters were found to be dependent on the structure, electronic configuration and molecular weight of metal complexes. Antimicrobial activity of the metformin free ligand and its vanadyl(II) and chromium(III) complexes were evaluated against the gram negative

Keywords: Metformin; Antimicrobial activity; Spectroscopic measurements ; Positron annihilation spectroscopy.

447. Synthesis, Characterization and Medical Efficacy (Hepatoprotective and Antioxidative) of Albendazole - Based Copper(II) Complexes – an Experimental and Theoretical Approach

Mohamed M. Ibrahim, Abdel-Motaleb M. Ramadan, Hamdy S. El-Sheshtawy,Mahmoud A. Mohamed, Mohamed Soliman and Sayed I.M. Zayed

a series of albendazole - based copper(II) complexes with different counter anions , $[Cu(Albz) (H_2O)_2] (ClO_4)_2$ (1) , $[Cu(Albz)_2(Cl)] Cl·_2H_2O$ (2), $[Cu(Albz)_2 (NO_3)] (NO_3)$ (3) , and $[Cu_2(Albz)_2 (\mu-SO_4)_2 (H_2O)_2]$ (4) (Albz = albendazole), have been synthesized and characterized . Their structures and properties were characterized by elemental analysis, thermal analysis (TGA, DTG and DTA) , IR , UV–vis and ESR spectroscopies, cyclic voltammetry , electrical molar conductivity, and magnetic moment measurements. A square-planar geometry is proposed for 1, whereas the five-coordinate copper(II) complexes 2, 3, and 4 have a square pyramidal geometry. Theoretical calculations (DFT) using B3LYP/6–311 + G(d,p) level of theory corroborated the experimental results to investigate both the drug Albz and its copper(II) complex, 1. The hepatoprotective and antioxidative efficacy of Albz and 1–4 were evaluated against carbon tetrachloride-induced acute hepatotoxicity in rats. Hepatotoxicity in experimental rats was evidenced by significant decrease in the antioxidant enzyme activities (SOD, GSH-S-transfers, and GSH-Rd levels). The results have strong impact for designing anticancer drugs, combined with their potential cytotoxic and antioxidant activities, which can be targeted selectively against cancer cells and increase their therapeutic index and advantages over other anticancer drugs. The DNA cleavage studies of Albz and its copper(II)

complexes usinggenomic DNA indicated that Albz has no role in cleavage of DNA, and only 1 played a marked role in the DNA cleavage without any external additives.

Keywords: Albendazole; Copper(II) complexes; Spectroscopy; Enzymatic antioxidants; Dna.

448. Insulin-Like Action of Novel Metformin-Containing Vanadate as A New Antidiabatic Drug: Synthesis, Characterization and Crystal Structure of [Metformin-H]$_2$ [V$_2$o$_6$]] · H$_2$O

Mohamed M. Ibrahim, Mahmoud A. Mohamed , Gaber A.M. Mersal and Salih Al-Juaid

A new vanadate compound, which contains interlamellary, the insulin enhancing agent metformin was prepared. Its structure was established to be $[Metformin]_2[V_2O_6].H_2O$ 1 by using elemental analysis, FTIR and ^1H-^{13}C NMR spectroscopic methods. The crystal structure of 1 shows that each of the two vanadium atoms is coordinated to four oxygen atoms, forming a distorted tetrahedral $\{VO_4\}$ that are arranged alternately to form one-dimension $\{V_2O_6\}_n^{2n}$chains. The chains are stabilized by an extensive hydrogen bonding involving oxide ligands of the chains and metformin molecules which fill the space between the stacks of chains. Furthermore, powder X-ray diffraction, EDX-SEM and TGA-DTA analysis of compound 1 are also investigated, which demonstrates its high purity and thermal stability. The thermoanalytical data evidence that compound 1 undergo complete decomposition, resulting in V_2O_5 as a residual product. Investigation of the glucose lowering activity by oral administration of compound 1 in streptozotocin-induced diabetic rats was examined

Keywords: Drug delivery; Insulin enhancing agent ; Metformin zanadate crystal structure.

449. Quick and Simple Formation of Charge Transfer Complexes of Brain and Nerves Phenytoin Drug With Different P–Acceptors: Chemical and Biological Studies

Omar B. Ibrahim, M.M. AL-Majthoub, Mahmoud A. Mohamed, Abdel Majid A. Adam and Moamen S. Refat

Charge transfer complexes formed from the chemical reactions between phenytoin drug (phen) as a nelectron donor and p-acceptors like 2,6-dichloroquinone-4-chloroimide (DCQ), 2,6-dibromoquinone- 4-chloroimide (DBQ) and N-bromosuccinimide (NBS) were spectrophotometrically discussed and synthesized in solid form. Spectroscopic and physical data such as formation constant (K_{CT}), molar extinction coefficient ($^\varepsilon CT$), standard free energy (ΔG^o), oscillator strength (f), transition dipole moment (μ), resonance energy (R_N) and ionization potential (I_p) were estimated in methanol at 25° C. Upon the elemental analysis and photometric titrations the CT-complexes were formed indicated the formation of 1:2 charge-transfer complexes. The charge-transfer interactions were interpretative according to the formation of dative ion pairs [phen $^{·+}$, A$^{·-}$], where A is acceptor.

All of the resulting charge transfer complexes were isolated in solid colored form and the complexes were discussed using infrared and proton NMR spectra. The surface morphology of the three phen complexes was scanned by scanning electron microscopy (SEM). In addition, the forned synthesized complexes was tested for antibacterial and antifungal activities against different strains of microorganism by disc diffusion method. The different antimicrobial activities depend on sanitized chemical structure and microorganism strains were recorded.

Keywords: Phenytoin; Charge transfer complexes; DCQ; DBQ; NBS.

450. Functional Characters Evaluation of Biscuits Sublimated with Pure Phycocyanin Isolated From Spirulina and Spirulina Biomass

Hanaa H. Abd El Baky, Gamal S. El Baroty and Eman A. Ibrahem

The aim of the present work is to study the effect of incorporation of biomass and phycocyanin extracts of Spirulina platensis growing in define media at large scales (300 liters, limited in nitrogen and high salinity) to traditional butter biscuits in order to increase general mental health as functional products, FPs). The FP were manufactured at a pilot scale formulated by adding algal biomass (0.3, 0.6 and 0.9%) and S. platensis phycocyanin (at 0.3%) to wheat flour and stored for one month at room temperature, protected from light and air. The approximate and nutrition composition of S. platensis biomass showed high quantity (% dry weight, dw.) of phycocyanin (13.51%, natural food colorant), tocopherols (0.43%), carotenoids (2.65%), vitamins C (1.25%), ω -6, ω -3 fatty acids, essential elements (Fe, Zn, Cr, Se, and others) and antioxidant compounds includes: total phenolic (1.73%), flavonoids (0.87%) and glutathione (0.245 mM). FPs showed a high oxidative stability during storage (30 days) periods (as assessed by antiradical scavenging activity of DPPH and TBA test), compared with that in untreated food products (control). Data of sensory evaluation revealed that FPs containing S. platensis biomass or algae extracts were significantly acceptable as control for main sensory characteristics (colour, odour/ aroma, flavor, texture, the global appreciation and overall acceptability). S. platensis FPs presented an accentuated green tonality, which increase with the quantity of added biomass. Thus, it could be concluded that functional biscuits had good sensory and nutritional profiles and can be developed as new niche food market.

Keywords: Microalgae; Spirulina platensis; Functional foods; Phycocyanin; Antioxidant; Natural food colorant.

451. Synthesis and Spectroscopic Characterizations of Noble Metal Complexes (Gold, Silver, Platinum) in the Presence of Selenium, and Their Biological Applications as Antibacterial, Antifungal, and Anticancer

Abdel Majid A. Adam , Moamen S. Refat and Mahmoud A. Mohamed

Six new adipic (adipH$_2$) and sebacic (sebacH$_2$) complexes of silver(I) , gold(III) , and platinum(IV) ions in the presence of selenium metal ; [(adip)Ag$_2$Se$_2$O$_2$ (OH)$_4$Cl$_2$] (1), [(adip) Au$_2$Cl$_4$Se$_2$O$_2$(OH) $_4$Cl$_2$] (2), [(adip) Pt$_2$Cl$_6$(H$_2$O)$_2$Se$_2$O$_2$ (OH)$_4$ Cl$_2$] (3) , [(sebac) Ag$_2$Se$_2$O$_2$ (OH) $_4$Cl$_2$] (4), [(sebac) Au$_2$Cl$_4$Se$_2$O$_2$(OH)$_4$Cl$_2$] (5), and [(sebac) Pt$_2$Cl$_6$ (H$_2$O) $_2$Se$_2$O$_2$(OH)$_4$Cl$_2$] (6) were designed and synthesized to enhance the biological treatments against bacteria, fungi, and cancer cells. The adip and sebac complexes were screened for antibacterial and antifungal activities. Adipic, sebacic acid, and their complexes were subjected to cytotoxicity evaluation against Ehrlich ascites carcinoma cell line by trypan blue assay. Biochemical parameters included activity of glutathione-S-transferase, while reduced glutathione levels and malondialdehyde levels which corresponded to cytotoxicity effects of tested compounds were evaluated. Also, spleen cytotoxicity was evaluated for bio-safety purpose.

Keywords: Adipic acid; Sebacic acid; Noble metals carboxylic acid; Spectroscopic studies; Anti-cancer evaluation.

452. Molecular Role of Nitric Oxide in Secondary Products Production in Ginkgo Biloba Cell Suspension Culture

Hossam Saad El-Beltagi, Osama K. Ahmed and Adel E. Hegazy

Effects of sodium nitroprusside (SNP; nitric oxide donor) treatment on the enhancement of secondary metabolites production, oxidative stress mediators (O$^{2-\cdot}$) accumulation and antioxidant defense enzymes of Ginkgo biloba callus culture was investigated. On one hand, the obtained data showed a highly metabolic modification of chemical constituents, PAL activity and various antioxidant defense enzymes (APX, SOD), which gradually increased in response to SNP treatments. On the other hands the high NO levels significantly increased the accumulation of various oxidative burst of O$^{2-\cdot}$. MS basal medium supplemented with casein hydrolase (500 mg/L), NAA and BA at equal concentration (0.5 mg/L) recorded the highest number of regenerated shoots (4.81 cm) and shoot height (4.96 cm) as well as root number (2.25 cm) and root length (4.5 cm). The highest survival (40%) was shown in acclimatization on the mixture containing sand, peat moss and vermiculite (1: 1: 1, v/v/v), which significantly confirmed and reflected the variation in survival percentage. Meanwhile, higher treatment (500 µM) of NO positively enhanced secondary products accumulation of total tannins, saponins, phenols and total flavonoids in G. biloba callus culture.

Keywords: Antioxidant enzymes; Ginkgo biloba; Nitric oxide; Oxidative burst; Secondary products; Tissue culture.

453. Chemical Composition, Antioxidant, Anticancer Properties and Toxicity Evaluation of Leaf Essential Oil of Cupressus Sempervirens

Sayed A. Fayed

The essential oil isolated by hydro-distillation from Cupressus sempervirens (Cypress) leaves was analysed by GC-MS and tested f or antioxidant and in vitro as well as in vivo anticancer activities. In addition, the toxicity effect of the essential oil was studied using normal Swiss mice. Eighteen components of Cypress essential oil were identified and the main essential oil components were (-pinene (29.21%), δ3-carene (18.92%), αcedrol (12.25%), αterpinolene (7.66%) and limonene (5.50%). Cupressus sempervirens essential oil was able to reduce the stable, purple-colored radical DPPH into yellow-colored DPPH reaching 50% of reduction with IC_{50} value = 290.09 µg mL^{-1}. The in vitro anticancer activity of the essential oil was studied against two human promyelocytic leukemia cell lines (HL-60 and NB4) and experimental animals model cancer cell line (EACC). Cypress essential oil exerted the highest cytotoxic activity with a LC50 of 333.79 µg mL^{-1} against NB4 followed by HL-60 and EACC cell lines (LC_{50} of 365.41, and 372.43 µg mL^{-1}, respectively). Regarding in vivo anticancer study, pre-initiation treatment with the essential oil was more effective than initiation and post-initiation treatments respectively on the tumor (EACC) transplanted female mice (increase life's pan (%), decrease total EACC number and increase dead cells). In toxicity study, serum urea, transaminases and lactate dehydrogenase were increased. The results obtained from this study showed that the Cypress essential oil possesses antioxidant and anticancer properties, taking into consideration its mild toxicity.

Keywords: Cypress; Essential oil DPPH; HL-60; NB4; EACC.

454. Synthesis of Novel 2-Amino-5-Arylazothiazol Derivatives and Their Biological Impacts: Assessment of Toxicity and Antioxidant Enzyme Activities

Mohamed E. Khalifa, Mahmoud A. Mohamed and Noura H. AlShehri

A reactivity study of both the amino group and the aryl substituent of a newly synthesized 2-amino-5-(4-acetylphenylazo) thiazole compound and its derivatives via various electrophilic reagents was performed to obtain new bioactive chalcone, imine, and pyrazole-thiazolidine derivatives. The synthe-sized compounds were chemically elucidated by analytical and spectral methods, and biologically evalu-ated in vitro and in vivo for their toxicity and antioxidant activity based on liver function enzymes.

Keywords: 2-Aminothiazole; Chalcone; Imine; Pyrazole; Azo Coupling; Biological activities.

455. Effect of Germination Time on Proximate Analysis, Bioactive Compounds and Antioxidant Activity of Lentil (Lens Culinaris Medik.) Sprouts

A. Ahmed Fouad and F. M. Ali Rehab

Background. The lentil plant, Lens culinaris L., is a member of the Leguminoceae family and constitutes one of the most important traditional dietary components. The purpose of the current study was to investigate the effects of sprouting for 3, 4, 5 and 6 days on proximate, bioactive compounds and antioxidative characteristics of lentil (Lens culinaris) sprouts. Material and methods. Lentil seeds were soaked in distilled water (1:10, w/v) for 12 h at room temperature (~25°C), then kept between thick layers of cotton cloth and allowed to germinate in the dark for 3, 4, 5 and 6 days. The nutritional composition, protein solubility, free amino acids, antinutritional factors, bioactive compounds and antioxidant activity of raw and germinated samples were determined using standard offi cial procedures.

Results. Sprouting process caused signifi cant ($P \leq 0.05$) increases in moisture, protein, ash, crude fi ber, protein solubility, free amino acids, total, reducing and nonreducing sugars. However, oil content, antinutritional factors (tannins and phytic acid) signifi cantly ($P \leq 0.05$) decreased. Results indicated that total essential amino acids of lentil seeds protein formed 38.10% of the total amino acid content. Sulfur-containing amino acids were the fi rst limiting amino acid, while threonine was the second limiting amino acid in raw and germinated lentil seeds. Sprouting process has a positive effect on the essential amino acid contents and protein effi ciency ratio (PER) of lentil sprouts. Phenolics content increased from 1341.13 mg/100 g DW in raw lentil seeds to 1411.50, 1463.00, 1630.20 and 1510.10 in those samples germinated for 3, 4, 5 and 6 days, respectively. Sprouted seeds had higher DPPH radical scavenging and reducing power activities.

Conclusions. Based on these results, sprouting process is recommended to increase nutritive value, and antioxidant activity of lentil seeds.

Keywords: Sprouting; Protein; Minerals; Phytate and antinational factors.

456. Isolation and Identification of Terpenoids and Sterols of Nepeta Cataria L.

Hemaia, M. Motawe; Faten, M. Ibrahim, Mohamed, E. Ibrahim, Ebtissam, A. Mahmoud and Hanan F. Aly

Chemical analysis of the air dried flowering aerial parts of N. cataria showed moisture (6.2%); ash (7.9%); crude fiber (15.57%); crude protein (9.13%); crude lipid (4.88%) and carbohydrate (62.5%).Fixed oil extracted from the air dried flowering aerial parts of N. cataria contained lauric (3.7%); myristic (7.2%); palmitic (20.3%); stearic (18.6%); arachidic (4.1%); palmitoleic (9.6%); oleic (14.2%); linoleic (9.3%) and linolenic (5.8%) in sap part and unsap contained dodecane (3.95%);a-tocopherol (5.3%); pentacosane (0.84%); hexacosane (10.16%); nonacosane (6.83%); henetricontane (26%); dotriacontane (2.98%) and. β-sitosterol (18.6%); stigmasterol (8.9%) and campsterol (6.52%). In identification of terpenoids and sterols of petroleum ether extract (40-60) of Nepeta cataria L, four major compounds 1, 2, 3 and 4 were isolated by column chromatography; according to their order of elution. Their spectral characters proved them to be a- amyrine, ixoroside aglycone, sitosterol and ursolic acid.

Keywords: Nepeta cataria; Sterols and triterpenes; Fatty acids.

457. GC-MS Analysis of Bioactive Phytochemicals Present in Ethanolic Extracts of Leaves of Annona Muricata: A Further Evidence for its Medicinal Diversity

Yahaya Gavamukulya, Faten Abou-Elella, Fred Wamunyokoli and Hany A El-Shemy

Background: Folk medicine has taken an important place especially in developing countries where limited health services are available. However, the absence of scientifi evaluation of medicinal plants may cause serious adverse effects. Objective: To analyze the phytochemical composition of the ethanolic extracts of leaves of Annona muricata using gas chromatography mass spectroscopy (GC-MS).
Materials and methods: GC-MS Analysis was used.
Results: The GC-MS Analysis revealed 25 constituents of which 12 of the compounds were identifid. The major constituents were two unidentifid compounds with percentage peak areas of 23.51% and 16.8%. Of the identifid compounds, the outstanding in composition were 7-Tetradecenal, (Z) (peak area 9.39%), n-Hexadecanoic acid (peak area 7.12%), Oleyl Alcohol (peak area 6.15%), Phytol (peak area 5.61%), cis, cis, cis-7,10,13-Hexadecatrienal (peak area 4.26%), 2-Pentadecanol (peak area 3.93%), 9,12-Octadecadienoic acid, ethyl ester (peak area 3.21%), 1,2-Benzenedicarboxylic acid, butyl octyl ester (peak area 2.67%), and 1,E- 11,Z-13-Octadecatriene (peak area 2.15%), while the rest had less than 2% composition by peak area.
Conclusion: The current study suggests that ethanolic extracts of leaves of Annona muricata are a potent therapeutic agent and paves the way for the development of several treatment regimens based on compounds from this extrac.
Keywords: Annona Muricata; Ethanolic extracts; GC-MS; Medicinal diversity; Phytochemicals.

458. Development of Gamma Irradiation Vaccine Against Mannheimia Haemolytica: A Preliminary Study

Sahar Ahmed, Basem S. Ahmed, Ghada I. Mahmoud, Walid Elnamer and E.A. Abdel-Rahim

The study aimed to use the several advantages of nuclear techniques for developing irradiation vaccine against Mannheimia haemolytica using different gamma radiation doses for vaccines preparation and different inoculation doses of irradiation vaccine. The M. haemolytica was exposed to different doses of gamma radiation. The dose rate was considered the optimum irradiating dose that was Lethal to M. haemolytica cells and selected for optimal gamma irradiation vaccine. Experimental animals were divided into four groups. The experimental groups injected twice with three weeks interval for tested vaccines. The first group (G^1) inoculated with 4×10^9 bacterial cells/dose from optimum irradiation vaccine. The second group (G^2) inoculated with 2×10^9 bacterial cells/dose from optimum irradiation vaccine. The third group (G^3)inoculated with 4×10^9 bacterial cells/dose from high irradiation vaccine. The fourth group (C) injected (S/C) with 2 mL sterile PBS and was kept as a control group. Vaccination challenge with wild M. haemolytica life organism (0.5 mL of 3.6×10^{10} mLG^1) was two doses for all experimental animals.

ELISA was used to evaluate the efficiency of vaccines. The antibodies production are evaluated using Optical Density (OD) value as an indication of the efficiency of vaccine against M. haemolytica. The results revealed that after the second vaccination dose, the OD value of G^2 showed a significant difference compared to G^1 and G^3 groups and it was non-significant between G^1 and G^3 groups. Comparative analysis of control and the different doses of gamma irradiation vaccines showed that after the second vaccination dose, the mean of OD value of the G^2 was a significant different while it was non-significant in the G1and G^3 compared to the control group. After vaccination challenge, the mean of OD value of G^2 was with high significant different compared to all of vaccinated and control groups.
Keywords: Vaccine; Gamma radiation; M. haemolytica; ELISA; Respiratory disease.

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459. The Genetic Basis of Composite Spike form in Barley and "Miracle-Wheat"

Naser Poursarebani, Tina Seidensticker, Ravi Koppolu, Corinna Trautewig, Piotr Gawron´ ski,Federica Bini, Geetha Govind, Twan Rutten, Shun Sakuma, Akemi Tagiri, Gizaw M. Wolde, Helmy M. Youssef, Abdulhamit Battal, Stefano Ciannamea,Tiziana Fusca .. et all

Inflorescences of the tribe Triticeae, which includes wheat (Triticum sp. L.) and barley (Hordeum vulgare L.) are characterized by sessile spikelets directly borne on themain axis, thus forming a branchless spike. 'Compositum-Barley' and tetraploid 'Miracle-Wheat' (T. turgidum convar. compositum (L.f.) Filat.) display noncanonical spike-branching in which spikelets are replaced by lateral branch-like structures resembling small-sized secondary spikes. As a result of this branch formation 'Miracle-Wheat' produces significantly more grains per spike, leading to higher spike yield. In this study, we first isolated the gene underlying spike-branching in 'Compositum-Barley,' i.e., compositum 2 (com2). Moreover, we found that COM2 is orthologous to the branched headt (bht) locus regulating spike branching in tetraploid 'Miracle-Wheat.' Both genes possess orthologs with similar functions in maize BRANCHED SILKLESS 1 (BD1) and rice FRIZZY PANICLE/BRANCHED FLORETLESS 1 (FZP/BFL1) encoding AP2/ERF transcription factors. Sequence analysis of the bht locus in a collection of mutant and wild-type tetraploid wheat accessions revealed that a single amino acid substitution in the DNA-binding domain gave rise to the domestication of 'Miracle-Wheat.' mRNA in situ hybridization, microarray experiments, and independent qRT-PCR validation analyses revealed that the branch repression pathway in barley is governed through the spike architecture gene Six-rowed spike 4 regulating COM2 expression, while HvIDS1 (barley ortholog of maize INDETERMINATE SPIKELET 1) is a putative downstream target of COM2. These findings presented here provide new insights into the genetic basis of spike architecture in Triticeae, and have disclosed new targets for genetic manipulations aiming at boosting wheat's yield potential.
Keywords: Miracle-wheat; Wunder-weizen; Compositum-barley; Inflorescence branching; Yield potential.

460. Alleviation of Drought-Induced Oxidative Stress in Maize (Zea Mays L.) Plants by Dual Application of 24-Epibrassinolide and Spermine

Neveen B. Talaat, Bahaa T. Shawky and Ahmed S. Ibrahim

Dual application [24-epibrassinolide (EBL) and spermine (Spm)] influence on the antioxidant machinery in water-stressed plants has received no attention. The present study, as a first investigation, was conducted with an aim to investigate the effects of EBL, Spm and their dual application on the ROS scavenging antioxidant defense machinery in plants subjected to drought conditions. This approach was assessed as possible mechanisms of drought tolerance and how these applications protect plants against oxidative stress. To achieve this goal, two maize hybrids (Giza 10 and Giza 129) were subjected to wellwatered conditions and water-stressed conditions (75% and 50% of field capacity) with and without EBL and/or Spm foliar application. The grains were sown in plastic pots containing clay-loam (sand 37%, silt 28%, clay 35%) soil (Inceptisols; FAO), under greenhouse condition. Water deficiency significantly reduced growth, productivity, and membrane stability index, particularly in hybrid Giza 10. However, the follow- up treatment with the dual application (25 mg l^{-1} Spm + 0.1 mg l^{-1} EBL) detoxified the stress generated by drought and significantly improved the above parameters, particularly in hybrid Giza 129. Drought stress significantly increased H_2O_2 and O_2^{-} contents and caused oxidative stress to lipids assessed by the increase in MDA content. However, they were significantly decreased in stressed plants treated with the dual application. Moreover, dual application alleviated the detrimental effects of drought on the electrolyte leakage. Activities of superoxide dismutase, catalase, ascorbate peroxidase, and glutathione reductase and levels of ascorbate, glutathione, proline, and glycinebetaine were increased in response to drought treatments as well as foliar applications. Dual application significantly alleviated droughtinduced inhibition in the activities of monodehydroascorbate reductase and dehydroascorbate reductase as well as in the ratios of AsA/DHA and GSH/GSSG. Overall, dual application improved the plant drought tolerance and decreased the accumulation of ROS by enhancing their scavenging through elevation of antioxidant enzymes activity and improving the redox state of ascorbate and glutathione.

Keywords: Antioxidant defence system; Drought stress; 24-Epibrassinolide; Maize (Zea Mays L.); Plant growth and Productivity; Spermine.

461. Effective Microorganisms Improve Growth Performance and Modulate the Ros-Scavenging System in Common Bean (Phaseolus Vulgaris L.) Plants Exposed to Salinity Stress

Neveen B. Talaat

No information is available concerning effective microorganisms' (EM) influence on the ROS-scavenging system under saline conditions. Thus, as a first approach, the present study evaluates the effect of EM on antioxidant machinery, and also visualizes the interrelationship between EM and salinity stress response components. Phaseolus vulgaris cv. Nebraska plants were grown under non-saline or saline conditions (2.5 and 5.0 dS m^{-1}) with and without EM application. Plants exposed to soil salinity exhibited a significant decline in growth, productivity and membrane stability index. However, the followup treatment with EM detoxified the stress generated by salinity and significantly improved the above parameters. The concentrations of proline and glycinebetaine, the activities of antioxidative enzymes (superoxide dismutase, peroxidase, catalase and glutathione reductase), and the contents of antioxidant molecules (glutathione, ascorbate, phenols and anthocyanins) were increased under saline conditions; these increases were more significant in saltstressed plants treated with EM. Soil salinization induced oxidative damage through increased lipid peroxidation, electrolyte leakage and hydrogen peroxide levels. EM application altered plant physiology and significantly reduced the oxidative damage. Both the prevention of oxidative stress and the elimination of ROS can be one of the most effective mechanisms used by EM-treated plants to gain tolerance against salinity stress. Indeed, with this biological strategy plants find protection from the deleterious effects of oxidants and cope with salty soils.

Keywords: Effective microorganisms; Plant growth; Phaseolus vulgaris; Productivity; Ros-scavenging system;Salinity stress.

462. Effective Microorganisms Improve Growth Performance, Alter Nutrients Acquisition and Induce Compatible Solutes Accumulation in Common Bean (Phaseolus Vulgaris L.) Plants Subjected to Salinity Stress

Neveen B. Talaat , Ahmed E. Ghoniem, Magdi T. Abdelhamid and Bahaa T. Shawky

No information is available concerning effective microorganisms (EM) influence on the ionic and osmotic responses in plants grown in salty soils. Therefore, as a first approach, this study focuses on the contribution of EM to nutrient acquisition and compatible solutes accumulation in salt-stressed plants. It assesses some mechanisms underlying alleviation of salt toxicity by EM application, and also directs to establish a possible interrelationship between EM application as well as ionic and osmotic stresses tolerance in plants exposed to saline soils. Phaseolus vulgaris cv. Nebraska plants were grown under non-saline or saline conditions (2.5 and 5.0 dS m^{-1}) with and without EM application. Salinity stress significantly decreased growth, productivity, membrane stability index, relative water content, concentrations of N, P, K^+, Fe, Zn and Cu, and the ratios of K^+/Na^+, Ca^{2+}/Na^+ and Mg^{2+}/Na^+. However, EM application protected plants against the detrimental effect of salinity and significantly improved the above parameters. Concentrations of Ca+2, Mg+2, soluble sugars, free amino acids, proline and glycinebetaine were increased under saline conditions; moreover they further increased in salt-stressed plants treated with EM. Lipid peroxidation, hydrogen peroxide content, electrolyte leakage and Na^+ level were increased in response to salinity and significantly decreased when stressed plants treated by EM. Reduction in Na uptake together with a concomitant increase in N, P, K, Ca, Mg, Fe, Zn and Cu absorption and a high compatible solutes accumulation may be an efficient mechanism used by EM-treated plants to gain tolerance against salinity stress.

463. Effective Microorganisms Modify Protein and Polyamine Pools in Common Bean (Phaseolus Vulgaris L.) Plants Grown Under Saline Conditions

Neveen B. Talaat

No information is available regarding the influence of effective microorganisms (EM) on protein syn-thesis and polyamine balance in plants grown under saline conditions. Thus, as a first approach, thisstudy sheds light on some different mechanisms that may protect EM-treated plants against salt excess.The response of common bean (Phaseolus vulgaris L.) cv. Nebraska to soil salinization [0.1 dS m^{-1}(non-saline), 2.5 and 5.0 dS m^{-1}] and/or EM application was investigated. Plants grown in saline soils exhibiteda significant decline in productivity, membrane stability index, nitrate reductase activity, nitrate and pro-tein content, K$^+$concentration, and K$^+$/ Na$^+$ ratio. However, EM application ameliorated the deleteriouseffects of salinity and significantly improved the above parameters. Soil salinity induced oxidative dam-age through increased lipid peroxidation and hydrogen peroxide content. EM application significantlyreduced the oxidative damage. Polyamines responded to salinity stress by increasing its content, partic-ularly putrescine level. The EM treatment changed the polyamine balance under saline conditions, a highincrease in spermidine and spermine levels was observed. Moreover, EM application significantly reducedthe activities of diamine oxidase and polyamine oxidase in salt-stressed plants. Both the modulation ofpolyamine pool and the regulation of protein synthesis can be one of the most important mechanismsused by EM-treated plants to improve plant adaptation to saline soils.

Dept. of Agricultural Microbiology

464. Isolation and Characterization of Multifunctional Streptomyces Species Antimicrobial , Nematicidal and Phytohormone Activities from with Environments in Egypt Marine

Ferial M. Rashad, Hayam M. Fathy, Ayatollah S. El-Zayat and Ahlam M. Elghonaimy

Different strategies have been employed for selective isolation of Streptomycetes from 20 marine sam- ples varied in their biological nature. The recovery of Streptomycetes isolates (112) was influenced preferentially by different strategies; sediment samples were the best source of potential candidate Streptomycetes. All isolates exhibited antimicrobial activities with variable spectrum; the most promis- ing isolates (31) were phenotypically characterized and identified as Streptomyces sp.; these isolates exhibited variable capacity for secretion of numerous hydrolytic enzymes such as catalase, protease, amylase, lipase, lecithinase, asparaginase, chitinase and pectinase. All the strains resisted both penicillin and streptomycin, 29 were sensitive to neomycin; the majority of strains (25) showed multiple antibiotic resistance index greater than 0.2; 23, 22 and 13 degraded the shrimp shell, chicken feather and corn cob, respectively, producing bioactive substance(s) which indicates their diversity and their ecological role in the marine ecosystem. At least 28 strains exhibited nematicidal activity in vitro and in vivo against root-knot nematode and supported plant growth. In vitro, the assessed Streptomyces species exhibited the ability to produce gibberellic acid, indole acetic acid, abscisic acid, kinetin and benzyladenine. Except for indole acetic acid, this is the first report concerning the ability of marine Streptomyces to produce such phytohormones and the use of shrimp shell waste as a mono component medium for production of phytohormones. The study is efficacious in selecting effective biodiverse strains of marine Streptomyces that may work under diverse agro-ecological conditions as a useful element in plant nutrition and as biocontrol agents involved in integrated management programs.

465. Improving the Nutritive Value, in Vitro Digestibility Andaerobic Stability of Hedychium Gardnerianum Silage Throughapplication of Additives at Ensiling Time

Mohamed A. Moselhy, João P. Borba and Alfredo E.S. Borba

The present study was designed to evaluate the effect of applying lactic acid bacteria (LAB)inoculant, molasses and urea (10^6cfu/g, 50 ml/kg and 5 g/kg on fresh basis, respectively) onensiling characteristics of Hedychium gardnerianum. Eight treatments of Hedychium wereinvestigated; untreated, with molasses, with urea and with molasses plus urea. Each ofthese was ensiled alone or after the addition of a bacterial inoculant (containing fibrolyticenzymes). The experimental design was a randomized complete block, with a 2 × 2 × 2 fac-torial arrangement of treatments. Forages were ensiled in laboratory silos for 60 days atroom temperature. Chemical composition, microbial populations and in vitro digestibilityof forages were determined before and after ensiling. Fermentation products and aerobicstability were measured after silos opening. Addition of molasses or molasses plus ureawith or without inoculation had the better (P<0.05) fermentation results. These silagesshowed lower enterobacteria, clostridial and yeast counts, the absence of molds and thehigher numbers of LAB. Also in these silages, the observed pH and ammonia nitrogen werebelow 4 and 40 g/kg TN, respectively. The inoculated silages presented the higher lacticacid (P<0.05) and the lower acetic, butyric and propionic acid values. The inoculated silageshad shorter periods of aerobic stability than the un-inoculated. Silages treated only withurea either inoculated or not showed the worst fermentation properties, the highest num-bers of undesired microbes, the lowest digestibility values and the early aerobic instability.While, silage received molasses plus urea with inoculant, revealed the best fermentationcharacteristics (pH 3.70; lactic acid, 72.4 g/kg DM; ammonia N, 29.4 g/kg TN and absence ofbutyric acid), the

highest crude protein value (183.6 g/kg DM) and the maximum digestibil-ity (56.31% over control). So, for the better utilization of H. gardnerianum as an alternative feed for ruminants, the later treatment is recommended.

Keywords: Hedychium gardnerianum; Lactic acid bacteria; Silage in vitro digestibility; Aerobic stability.

466. Isolation and Characterization of Antibiotic/ Antitumor Producing Streptomyces.

Ferial M Rashad, Nadia H Abd El-Nasser, Insaf E Dawoud and Fatima H Motawe

A total of 500 Streptomycetes strains were isolated from twenty soil samples and screened for their antimicrobial activity. Only 56 isolates exhibited antimicrobial activity, of which two isolates showed a broad spectrum. They were identified phenotypically and genotypically as Streptomyces fluvissimus-FHM275 and Streptomyces pratensis-FHM572. MIC values of their crude extracts confirmed their antimicrobial potencies. Anticancer activities of the crude extracts were measured against human hepatocellular carcinoma cell line (HePG 2), human Caucasian breast adenocarcinoma (MCF 7), colon cell line (HCT 116) and lung carcinoma cell line (A549) as well as normal human epithelial amnion cells. The crude extract of St fluvissimus-FHM275 showed antitumor activity only against HCT116 and A549 with lC 15.5, 15.3 µg/ ml and SI, 3.6 and 3.7, 50 respectively; however, St. pratensis-FHM572 showed a wide spectrum of cytotoxic activity towards most tested human antitumor cell lines, its extract appears to be both the most potent and most selective against A549 (IC 50 = 7.5 µg/ml, SI = 7.9).

Keywords: Antimicrobial Activity; Antitumor activity; Selectivity index; St. fluvissimus - FHM275; St. pratensis-FHM572; Lung cancer; Colon cancer.

Dept. of Agricultural Zoology and Nematology

467. Compatibility and Integration Between Some Control Methods in Controlling Tetranychus Urticae Koch Infesting Tomato Plants in in Egypt

Mahmoud Monir Ahmed Abdelmohsin

A field experiment to estimate the efficiencies of the two predators; Phytoseiulus persimilis (A.-H.) and Orius albidipennis (Reuter), four products of entomopathogenic fungi; (Bio-Power, Bio-Magic, Bio-Catch and Priority contains spores & mycelial fragments 1x10^9 CFU's/ml of Beauveria bassiana, Metarhizium anisopliae, Verticillium lecanii and Paecilomyces fumosoroseus, respectively), three recommended acaricides; (Maccomite 10% WP, Milbeknock 1% EC and Nimbecidine 0.03 % EC) and Lemongrass oil, for controlling Tetranychus urticae Koch on tomato plants was conducted at Giza Governorate, Egypt in the two successive seasons 2013 and 2014. Experimental treatments were divided into three categories depending on their reduction percentages. Highest reduction percentages (≤ 70 %) of T. urticae

were recorded at the treatments of (P. persimilis + Milbeknock 1% EC), (P. persimilis + Nimbecidine 0.03%EC), (P. persimilis + Priority + Nimbecidine 0.03% EC) and (P. persimilis + Priority + Milbeknock 1% EC), which averaged 76.76, 74.89, 73.91 and 73.31%, respectively. The moderate reduction percentages (=50 to70> %) were recorded at the treatments of Milbeknock 1% EC, P. persimilis, Maccomite 10% WP, Nimbecidine 0.03% EC, (P. persimilis + Priority) and O. albidipennis, which averaged 60.88, 60.33, 59.07, 58.76, 58.41and 50.22%, respectively, while the lowest reduction percentages (> 50%) of T. urticae were recorded at the treatments of Lemongrass oil, (P. persimilis + O. albidipennis), Bio-Power, Bio-Magic, Priority and Bio-Catch, which averaged 46.10, 38.34, 33.89, 32.22, 28.65 and 25.95 %), respectively. The combination of (Milbeknock 1% EC or Nimbecidine 0.03% EC) with P. persimilis releases was highly effective for management of the TSSM on tomato plants in open field. The combination of the predatory mite and the predatory insect was less effective than single treatment of each. It can be recommended that the integration of more than one tool has a synergistic effect in controlling T. urticae and consequently, minimize the using of chemical pesticides.

Keywords: Tetranychus urticae; Phytoseiulus persimilis; Orius albidipennis; Entomopathogenic fungi; Acaricides; Lemongrass Oil.

Dept. of Agronomy

468. Enhancing the Efficiency of Evaporative Cooling Pads for Livestock Barns and Greenhouses by Moisture Adsorption

M. Samer, E. Abdelsalam and Y. B. Abd Elhay

High levels of relative humidity negatively affect the efficiency of the evaporative cooling pads installed in livestock barns and greenhouses. Consequently, the productivity decreases causing economic losses. Therefore, this project aims at prototyping innovative dehumidifying/desiccant segments to be installed on the conventional cooling pads enabling them to provide suitable microclimate conditions, especially temperature and relative humidity, for animals and plants. The hypothesis is that desiccant segments adsorb air moisture before introducing the air into the pads; consequently, the treated air is then able to absorb more moisture from the cooling pads, i.e. the cooling pads evaporate more water in the treated air, where water evaporation requires heat energy which is absorbed from the treated air which results in decreasing the treated air temperature. Theoretical and experimental investigations were conducted, where 211 laboratory experiments were performed for testing this hypothesis. The theoretical investigations (calculations and designs) were conducted using the results of the lab experiments. This study presents a methodology for testing desiccant materials and assessing their suitability as filling for the desiccant segments. The water adsorption capacity was 125, 158, 257, 132, 142 g H2O/kg desiccant, and the water adsorption rate was 17, 22, 36, 18, 20 g H^{2}O/(kg desiccant h) for ARTSorbTM, PROSorbTM, Silica Gel, Silica Gel Macro-porous, and the mixture of all 4 desiccants, respectively. Model calculations showed that the required amount of desiccant per unit area of pads is 70 kg/m2. The thickness of the desiccant segments is 10 cm, with a total pressure drop of 0.6 kPa under the toughest

conditions of air velocity of 2.5 m/s and 2 mm bead size. The desiccant segments require 0.18 kW extra energy per m_2 of pads to overcome the extra pressure drop, i.e. 63.5 kWh/m_2 and month which is the energy required by the extractor fans and costs 12.7 € / m2 month approximately. The results show potential for developing a desiccant system to improving the efficiency of cooling pads for livestock barns and greenhouses.

Keywords: Cooling pads; Livestock housing; Heat stress; Indoor air Quality; Greenhouses.

Dept. of Animal Production

469. Antioxidant Capacity of Melatonin on Preimplantation Development of Fresh and Vitrified Rabbit Embryos: Morphological and Molecular Aspects

Gamal M. K. Mehaisen, Ayman M. Saeed, Ahmed Gad, Ahmed O. Abass,Mahmoud Arafa and Ashraf El-Sayed

Embryo cryopreservation remains an important technique to enhance the reconstitution and distribution of animal populations with high genetic merit. One of the major detrimental factors to this technique is the damage caused by oxidative stress. Melatonin is widely known as an antioxidant with multi-faceted ways to counteract the oxidative stress. In this paper, we investigated the role of melatonin in protecting rabbit embryos during preimplantation development from the potential harmful effects of oxidative stress induced by in vitro culture or vitrification. Rabbit embryos at morula stages were cultured for 2 hr with 0 or 10-3 M melatonin (C or M groups). Embryos of each group were either transferred to fresh culture media (CF and MF groups) or vitrified/devitrified (CV and MV groups), then cultured in vitro for 48 hr until the blastocyst stage. The culture media were used to measure the activity of antioxidant enzymes: glutathione-s-transferase (GST) and superoxide dismutase (SOD), as well as the levels of two oxidative substrates: lipid peroxidation (LPO) and nitric oxide (NO). The blastocysts from each group were used to measure the expression of developmental-related genes (GJA1, POU5F1 and Nanog) and oxidative-stress-response-related genes (NFE2L2, SOD1 and GPX1). The data showed that melatonin promoted significantly (P<0.05) the blastocyst rate by 17% and 12% in MF and MV groups compared to their controls (CF and CV groups). The GST and SOD activity significantly increased by the treatment of melatonin in fresh or vitrified embryos, while the levels of LPO and NO decreased (P<0.05). Additionally, melatonin considerably stimulated the relative expression of GJA1, NFE2L2 and SOD1 genes in MF and MV embryos compared to CF group. Furthermore, melatonin significantly ameliorated the reduction of POU5F1 and GPX1 expression induced by vitrification. The results obtained from the current investigation provide new and clear molecular aspects regarding the mechanisms by which melatonin promotes development of both fresh and vitrified rabbit embryos.

Keywords: Melatonin; Vitrification; Antioxidant enzymes; Gene expression; Rabbit embryos.

470. Genome-Wide DNA Methylation Patterns of Bovine Blastocysts Developed in Vivo from Embryos Completed Different Stages of Development in Vitro

Dessie Salilew-Wondim, Eric Fournier, Michael Hoelker, Mohammed Saeed-Zidane,Ernst Tholen, Christian Looft, Christiane Neuhoff, Urban Besenfelder, Vita Havlicek,Franca Rings, Dominic Gagné, Marc-André Sirard, Claude Robert, Habib A. Shojaei Saadi, Ahmed Gad, Karl Schellander and Dawit Tesfaye

Early embryonic loss and altered gene expression in in vitro produced blastocysts are believed to be partly caused by aberrant DNA methylation. However, specific embryonic stage which is sensitive to in vitro culture conditions to alter the DNA methylation profile of the resulting blastocysts remained unclear. Therefore, the aim of this study was to investigate the stage specific effect of in vitro culture environment on the DNA methylation response of the resulting blastocysts. For this, embryos cultured in vitro until zygote (ZY), 4-cell (4C) or 16-cell (16C) were transferred to recipients and the blastocysts were recovery at day 7 of the estrous cycle. Another embryo group was cultured in vitro until blastocyst stage (IVP). Genome-wide DNA methylation profiles of ZY, 4C, 16C and IVP blastocyst groups were then determined with reference to blastocysts developed completely under in vivo condition (VO) using EmbryoGENE DNA Methylation Array. To assess the contribution of methylation changes on gene expression patterns, the DNA methylation data was superimposed to the transcriptome profile data. The degree of DNA methylation dysregulation in the promoter and/or gene body regions of the resulting blastocysts was correlated with successive stages of development the embryos advanced under in vitro culture before transfer to the in vivo condition. Genomic enrichment analysis revealed that in 4C and 16C blastocyst groups, hypermethylated loci were outpacing the hypomethylated ones in intronic, exonic, promoter and proximal promoter regions, whereas the reverse was observed in ZY blastocyst group. However, in the IVP group, as much hypermethylated as hypomethylated probes were detected in gene body and promoter regions. In addition, gene ontology analysis indicated that differentially methylated regions were found to affected several biological functions including ATP binding in the ZY group, programmed cell death in the 4C, glycolysis in 16C and genetic imprinting and chromosome segregation in IVP blastocyst groups. Furthermore, 1.6, 3.4, 3.9 and 9.4% of the differentially methylated regions that were overlapped to the transcriptome profile data were negatively correlated with the gene expression patterns in ZY, 4C, 16C and IVP blastocyst groups, respectively. Therefore, this finding indicated that suboptimal culture condition during preimplantation embryo development induced changes in the DNA methylation landscape of the resulting blastocysts in a stage dependent manner and the altered DNA methylation pattern was only partly explained the observed aberrant gene expression patterns of the blastocysts.

Keywords: DNA methylation; Bovine; Blastocyst.

471. Quantitative Trait Loci Segregating in Crosses Between New Hampshire and white Leghorn Chicken Lines: IV. Growth Performance

M. K. Nassar, Z. S. Goraga and G. A. Brockmann

Reciprocal crosses between the inbred lines New Hampshire (NHI) and White Leghorn (WL77) comprising 579 F2 individuals were used to map QTL for body weight and composition. Here, we examine the growth performance until 20 weeks of age. Linkage analysis provided evidence for highly significant QTL on GGA1, 2, 4, 10 and 27 which had specific effects on early or late growth. The highest QTL effects, accounting for 4.6–25.6% of the phenotypic F2 variance, were found on the distal region of GGA4 between 142 and 170 cM (F = 13.68). The NHI QTL allele increased body mass by 141.86 g at 20 weeks. Using body weight as a covariate in the analysis of body composition traits provided evidence for genes in the GGA4 QTL region affecting fat mass independently of body mass. The QTL effect size differed between sexes and depended on the direction of cross. TBC1D1, CCKAR and PPARGC1A are functional candidate genes in the QTL peak region. Our study confirmed the importance of the distal GGA4 region for chicken growth performance. The strong effect of the GGA4 QTL makes fine mapping and gene discovery feasible

Keywords: Body weight; Body weight gain; Cckar; Gene mapping; Growth; Inbreeding; Linkage; Ppargc1a; Selection; TBC1D1.

472. Lactating Performance, Water and Feed Consumption of Rabbit Does Reared Under A Mediterranean Summer Circadian Cycle of Temperature V. Comfort Temperature Conditions

M. H. Bakr, L. Tusell O. Rafel, M. Terré, J. P. Sánchez and M. Piles

The general aim of this research was to study the effect of high ambient temperature on the performance of does during lactation, specifically the following factors: average daily feed (ADFI) and water (ADWI) intakes, daily milk yield (DMY); milk composition: dry matter (DM), CP and gross energy (GE); doe BW (DW); individual kit weaning weight (IWW) and litter survival rate during lactation (SR). The study was undertaken comparing the performance of two groups of contemporary does reared under the same management, feeding regime and environmental conditions, except the environmental temperature and humidity. A total of 80 females were randomly allocated, at 60 days of age, into two identical and continuous rooms. In one room, the temperature was maintained permanently within the thermo-neutral zone (between 18°C to 22°C); thus, environmental conditions in this room were considered as comfort conditions. In the second room, the environmental temperature pattern simulated the daily temperature cycles that were characteristic of the summer in Mediterranean countries (24°C at 0800 h, increasing up to 29°C until 1100 h; maintenance at 29°C to 31°C for 4 h and decreasing to about 24°C to 26°C around 1700 h until 0800 h of the following day), which were considered as thermal stress conditions. Females followed a semi-intensive reproductive rhythm, first artificial insemination at 4.5 months of age, with subsequent 42-day reproductive cycles. Traits were recorded from a total of 138 lactations. Does were controlled up to the 5th lactation. Data were analyzed using linear and linear mixed models. High ambient temperature led to a lower ADFI (-9.4%), DW (-6.2%) and IWW (-8%), but it did not affect ADWI. No significant difference was found either for DMY, milk composition (DM, CP and GE) and SR during the lactation

period. Heat stress was moderate, and does were able to adapt to it behaviorally by decreasing feed intake (to reduce heat production), but also live weight, allowing them to preserve milk yield and composition for assuring litter survival. On the other hand, water consumption could not be the main animal mechanism to overcome heat stress

Keywords: Food and water consumption; Heat stress; Milk yield; milk composition; Rabbits.

473. Effects of Rice Bran on Performance, Egg Quality, Oxidative Status, Yolk Fatty Acid Composition, and Fatty Acid Metabolism-Related Gene Expression in Laying Ducks

D. Ruan, Y. C. Lin, 1 W. Chen, S. Wang, W. G. Xia, A. M. Fouad and C. T. Zheng

The study was designed to evaluate the effects of different dietary levels of rice bran (RB) in laying duck diets on performance, egg quality, oxidation status, egg yolk fatty acid composition, and hepatic expression of fatty acid metabolism-related genes. Longyan females (1080) with similar BW at 19 wk of age were randomly assigned to 6 dietary treatments, each consisting of 6 replicates of 30 birds. The basal diet (I) was a typical corn-soybean ration while the experimental diets (II to VI) substituted RB for corn and wheat bran and a small reduction of soybean meal. The level of substitution in diets (II to VI) was 6%, 12%, 18%, 24%, and 30%, respectively. The experiment lasted for 12 wks. Average egg weight and daily egg mass decreased linearly as the level of RB inclusion increased (P < 0.001) and feed conversion ratio linearly increased (P < 0.001). The proportions of C14:0 and C18:0 and total saturated fatty acids (SFA) in egg yolk linearly decreased with increasing RB, and many of the key polyunsaturated fatty acids (PUFA), like C18:2 n-6 and C18:3 n-3, linearly increased (P < 0.001), but not those of C20:5 n-3 and C22:6 n-3. There were linear decreases (P < 0.001) in hepatic abundance of FAS and SREBP1 transcripts, with a substantial reduction to about 30% those of ducks fed the control diet; there were no treatment effects on productive performance, eggshell thickness, strength, Haugh unit, antioxidation status, and egg yolk cholesterol or triglyceride content (P > 0.05). In conclusion, the current study suggests that ducks from 19 to 31 wk could be fed diets with up to about 18% RB without effect on the number of eggs produced, egg quality, and oxidative status. Increasing amounts of RB linearly increased egg yolk concentrations of key fatty acids like C18:2 n-6 and C18:3 n-3 and decreased the hepatic abundance of FAS and SREBP-1 transcripts

Keywords: Rice bran; Performance egg; Quality oxidative status fatty acids.

474. Influence of the Main Cereal and Feed form of the Rearing Phase Diets on Performance, Digestive Tract, and Body Traits of Brown-Egg Laying Pullets from Hatch to 17 Weeks of Age[1]

B. Salda~na, P. Guzm´an, H. M. Safaa, R. Harzalli, and G. G. Mateos

The effects of the main cereal and feed form of the rearing phase diets on growth performance, gastrointestinal tract characteristics, and body traits were studied in brown-egg pullets from hatch to 17 wk of age. Eight dietary treatments that were a combination of 2 main cereals (corn vs. wheat) and 4 feeding programs were used. The feeding program consisted in feeding crumbles from 0 to 5, 0 to 10, or 0 to 17 wk of age followed by mash until 17 wk, or feeding mash continuously from 0 to 17 wk. Each treatment was replicated 9 times. From hatch to 17 wk of age, pullets fed corn had similar ADG but poorer feed conversion ratio (FCR; P < 0.001) than pullets fed wheat. Also, pullets fed crumbles continuously (0 to 17 wk) had greater ADG (12.3 vs. 11.5 g; P < 0.001) and better FCR (4.21 vs. 4.36; P < 0.001) than pullets feed mash continuously, with pullets that were changed at any age of the rearing period from crumbles to mash feeding showing intermediate results. At 17 wk of age, the relative weights (% BW) of the gastrointestinal tract and gizzard were greater in pullets fed corn than in pullets fed wheat (P < 0.01) but the relative length (cm/kg full BW) of the small intestine, body, and tarsus was not affected. Pullets fed crumbles continuously had lighter gizzards (P < 0.001), higher gizzard pH (P < 0.001), and were shorter (P < 0.01) than pullets fed mash continuously, with pullets fed the other 2 treatments being intermediate. In summary, wheat can be used in substitution of corn in pullet diets without any adverse effect on growth performance. Feeding crumbles improves pullet performance but hinders gizzard and gastrointestinal tract development. Growth performance, gastrointestinal tract, and body traits of the pullets re-adapt quickly to changes in feed form of the rearing diets.
Keywords: Corn; Crumbles; Gastrointestinal tract development; Mash; Wheat.

475. Effect of Breeder Age and Lighting Regimen on Growth Performance, Organ Weights, Villus Development, and Bursa of Fabricius Histological Structure in Broiler Chickens

M.I. El Sabry, S. Yalçin and G. Turgay-İzzetoğlu

This study was carried out to investigate the effect of breeder age and lighting regimen on performance, some organ weights, villus development, and bursa of fabricius histological structure in broiler chickens. A total of 384 one-day-old chicks were obtained from two Ross broiler breeder flocks at 32 (young;Y) and 49 (old, O) weeks of age. Chicks from each breeder age were reared under 18 h light : 6 h dark (18 L : 6 D) (control; CL) or 14 L : 4 D : 2 L 4 D (split darkness, SD). Body weight, feed intake, feed conversion ratio, and mortality were measured weekly during the experiment. At 21 days of age, liver, heart, spleen, and bursa of fabricius weights were recorded, gastrointestinal tract and jejunum lengths were measured, and histomorphometry of villi and bursa of fabricius structure were investigated. Interaction between breeder age and lighting regimen was observed, where Y-CL chicks had the lightest body weight from 7 to 35 days (P < 0.05). Neither breeder age nor lighting regimen influenced feed conversion ratio. SD chicks had longer (P < 0.05) gastrointestinal tract and jejunum, and wider villus in comparison to CL chicks. Lower relative spleen weight was observed in CL chicks compared to SD ones (P < 0.05). It was concluded that split darkness lighting regimen could be used for broiler chickens from

young breeders to improve live body weight without affecting feed conversion ratio.
Keywords: Photoperiod; Body weight; Gastrointestinal tract; Heart; Lymphoid organs; Mortality.

476. Effects of Breed, Parity and Post-Mating Nutrition on Reproductive Wastage and Pregnancy Outcomes of Egyptian Sheep

Ibrahim Ibrahim Abdel-Mageed

The aim of this work was to investigate the effects of breed, parity and post-mating nutrition on reproductive wastage and pregnancy outcomes in subtropical sheep. The experimental design was completely randomized and different groups of ewes were arranged factorially ($2 \times 2 \times 3$) according to the breed (Rahmani or Barki), parity of the ewes (nulliparous or parous) and post-mating nutritional regimen through the first 45 days of pregnancy (70%, 100% and 130% of maintenance requirements). Barki ewes had higher ability to store back fat through the last third of pregnancy compared to Rahmani ewes. The parous ewes had higher body weight gain and higher body condition score through pregnancy, while they lost lower body weight and body condition score through suckling. The under-nourished ewes had lower body weight, body condition score, back fat and back muscle throughout the whole reproductive cycle. Higher reproductive wastage at weaning was observed in the nulliparous ewes (70%) compared to the parous ones (42%). The under- and the over-nourished groups had a double-fold reproductive wastage through different times of reproductive cycle compared to those fed the maintenance requirements. The parous and the moderately-fed sheep had higher proportion of lambs born, kilograms born, lambs weaned, kilograms weaned and ewes weaned to ewes conceived. Therefore, to maximize lamb crop at weaning, it is important to control the feeding allowance of ewes in early pregnancy to be similar to the maintenance requirements.
Keywords: Sheep; Rahmani and barki breeds; Parity; Post; Mating nutrition; Reproductive wastage; Pregnancy outcomes.

477. Reproductive Performance of Holstein Dairy Cows Grazing in Dry-Summer Subtropical Climatic Conditions: Effect of Heat Stress and Heat Shock on Meiotic Competence and iIn Vitro Fertilization

Krishna Pavani, Isabel Carvalhais, Marwa Faheem , Antonio ChaveiroFrancisco Vieira Reis, and Fernando Moreira da Silva

The present study was designed to evaluate how environmental factors in a dry-summer subtropical climate in Terceira-Azores (situated in the North Atlantic Ocean: 38° 43' N 27° 12' W) can affect dairy cow (Holstein) fertility, as well as seasonal influence on in vitro oocytes maturation and embryos development. Impact of heat shock (HS) effects on in vitro oocyte's maturation and further embryo development after in vitro fertilization (IVF) was also evaluated. For such purpose the result of the first artificial insemination (AI) performed 60 to 90 days after calving of 6,300 cows were recorded for one year. In parallel, climatic data was obtained at different elevation points (n = 5) from 0 to 1,000 m

and grazing points from 0 to 500 m, in Terceira island, and the temperature humidity index (THI) was calculated. For in vitro experiments, oocytes (n = 706) were collected weekly during all year, for meiotic maturation and IVF. Further, to evaluate HS effect, 891 oocytes were collected in the cold moths (December, January, February and March) and divided in three groups treated to HS for 24 h during in vitro maturation at: C (Control = 38.5°C), HS1 (39.5°C) and HS2 (40.5°C). Oocytes from each group were used for meiotic assessment and IVF. Cleavage, morula and blastocyst development were evaluated respectively on day 2, 6, and 9 after IVF. A negative correlation between cow's conception rate (CR) and THI in grazing points (−91.3%; p<0.001) was observed. Mean THI in warmer months (June, July, August and September) was 71.7±0.7 and the CR (40.2±1.5%) while in cold months THI was 62.8±0.2 and CR was 63.8±0.4%. A similar impact was obtained with in vitro results in which nuclear maturation rate (NMR) ranged from 78.4% (±8.0) to 44.3% (±8.1), while embryos development ranged from 53.8% (±5.8) to 36.3% (±3.3) in cold and warmer months respectively. In vitro HS results showed a significant decline (p<0.05) on NMR of oocytes for every 1°C rising temperature (78.4±8.0, 21.7±3.1 and 8.9±2.2, respectively for C, HS1, and HS2). Similar results were observed in cleavage rate and embryo development, showing a clear correlation (96.9 p<0.05) between NMR and embryo development with respect to temperatures. Results clearly demonstrated that, up to a THI of 70.6, a decrease in the CR occurs in first AI after calving; this impairment was confirmed with in vitro results.

Keywords: Environmental stress; Artificial insemination; Heat shock; Oocyte meiotic maturation; Maternal heat stress.

478. Optimisation of Total RNA Extraction from Bovine Oocytes and Embryos for Gene Expression Studies and Effects of Cryoprotectants on Total RNA Extraction[1]

K. C. Pavani, E. E. Baron, M. Faheem, A. Chaveiro and F. Moreira Da Silva

Gene expression is required for understanding bovine oocytes meiotic maturation as well as the potential of embryonic development. In the present study a standardized reagent protocol for total RNA extraction was designed for bovine oocytes and embryos, which is considered specific and less expensive. For such purpose oocytes (n = 795) recovered from about 80 ovaries were divided in three groups: Group 1 modified Trizol® (MTP, n = 355); Group 2 Guanidinium thiocyanate protocol (GNTC, n = 140) and Group 3 Commercial Kit protocol (CKP, n = 60). Oocytes belonging to group 1 (n = 100) and 3 (n = 20) were subjected to vitrification using two cryoprotectants 1,2 propandiol (PROH) or Dimethylsulfoxide (DMSO). The 240 remaining oocytes were divided into 3 groups in which 100 were used, in fresh, for in vitro fertilization, and 140 oocytes were vitrified using PROH (n = 70) and DMSO (n = 70) as cryoprotectants, being then fertilized in vitro after thawing. Embryos were used nine days after fertilization. Gene amplification (SDHA,GAPDH and DNMT1) was performed in oocytes, and gene quantification (DNMT1) in in vitro produced embryos at the stage of blastocyst (n Efficiency of the extraction was further compared. The purity of all samples to different protocols ranged from 1.10 to 1.25 for GNTC protocol; from 2.05 to 2.63 for the CKP and from 1.50 to

2.11 for the developed MTP, being the last one nearest to the expected purity levels for RNA sam ples (1.7–2.0). On average, for 30 fresh oocytes, from spectrophotometer readings, total RNA concentration was 127.8 ± 9.3 ng µL⁻¹ for MTP, against 46.4 ± 9.5 ng µL⁻¹ from CKP and 47.6 ± 12.9 ng µL⁻¹ for GNTC protocol. Using the MTP to evaluate RNA in 30 vitrified/thawed oocytes, resulted in a total RNA concentration of 61.3 ± 3.3 ng µL⁻¹ and 40.0 ± 12.4 ng µL⁻¹, respectively for DMSO and PROH. Regarding total RNA concentration and purity, in blastocyst stage, more purity was observed in DMSO as compared to PROH (1.8 vs. 1.2) (p < 0.05). Better results were also observed on the MTP for gene amplification when compared with the other protocols. For gene quantification, the proposed protocol quantified DNMT1 gene with PCR efficiency (0.933) after normalization against GAPDH and SDHA. Amplification and quantification of genes proved specificity and efficiency of the MTP over the other protocols.

Keywords: Total RNA extraction; Bovine oocytes and embryos; Gene; Amplification and gene quantification.

479. Blood Metabolic Profile and Certain Hormones Concentrations in Egyptian Buffalo During Different Physiological States

Neama Ahmed Ashmawy

The aim of this study is to determine the influence of physiological status on blood metabolic profile, enzymes and some hormones concentration in the blood of Egyptian buffalo. Investigations were carried out on 24 buffalo (12 pregnant buffalo cows on the 60th day prior to parturition and 12 lactating buffalo cow from 10th day of lactation during winter feeding season). The buffalo cow was average 3 years old and healthy. Buffalo were fed according to Mehlet Moussa Experimental Station which belongs to Animal Production Research Institute, north part of the Nile Delta, Egypt. The present study indicated that there was drop in calcium, sodium, phosphorus and potassium levels during early stage of lactation than pregnant period buffaloes, the opposite trend recorded in chloride levels. The concentrations of plasma glucose, urea, cholesterol, triglycerides and total protein were higher during pregnant period than in lactation period, the opposite trend recorded in creatinine level. The present study indicated that, the blood enzymes (AST, ALT and AlP) activities were insignificantly higher during pregnant period than in lactation period. The concentrations of plasma IGF-1, thyroid hormones and leptin were higher during pregnant period than in lactation period.

Keywords: Buffaloes; Lactation; Pregnancy; Electrolytes; Biochemical parameters.

480. Use of Ultrasound Measurements to Predict Carcass Characteristics of Egyptian Ram-Lambs

R. Agamy, A.Y. Abdel-Moneim, M.S. Abd-Alla, Abdel-Mageed and G.M. Ashmawi

Four ultrasound measurements were used to establish prediction equations to predict weight of carcass components of forty five Egyptian ram-lambs at 12 months of age. The measurements were depth, width, area of eye muscle (Longissimus dorsi) and thickness of fat covering at the 12th and 13th ribs area. Data were analysed by least squares procedure of General Linear Model (GLM) using SAS statistical package (SAS, 2004) and simple correlation coefficients and prediction equations were calculated. Correlation coefficients between ultrasound and carcass Longissimus dorsi muscle area were positive and significant in Barki (0.55) and Rahmani (0.83) ram-lambs. Body weight contributed 66% of the variation in total trimmed meat weight of Egyptian ram-lambs. Whereas, ultrasound Longissimus dorsi muscle area came next and scored a partial determination of 16% increasing the model's R^2 to 82%. The obtained results clearly indicate that ultrasound measurements could be used for accurate prediction of carcass components in Egyptian ram-lambs.

Keywords: Ossimi; Barki; Rahmani; Prediction; Ultrasound Measurements; Carcass composition.

481. Using Linear Body Measurements to Predict Body Weight and Carcass Characteristics of Three Egyptian Fat-Tailed Sheep Breeds

R. Agamy, A.Y. Abdel-Moneim, M.S. Abd-Alla, Abdel-Mageed and G.M. Ashmawi

Five body measurements of 45 ram-lambs from Barki, Ossimi and Rahmani fat-tailed breeds (15 of each) were recorded at slaughter at 12 months of age to predict weights of live body and hot carcass. The measurements were body length, height at withers, heart girth, paunch girth and leg circumference. Simple correlation coefficients between body measurements with body weight and carcass traits were calculated. The stepwise procedure was used to select the variable for prediction equations of carcass composition. In Ossimi and Rahmani ram-lambs, body weight was significantly correlated with most measurements, while in Barki ram-lambs only heart girth was significantly correlated with body weight. All body measurements used to predict the weights of body and hot carcass had positive and significant regression coefficients. To predict total trimmed meat weight of Ossimi and Rahmani, heart girth must be included in the models with an accuracy of 0.66 and 0.89. The obtained results clearly indicate that weights of live body, hot carcass, total trimmed meat and total bone in carcasses could be predicted by measuring some live body measurements such as body length, heart girth, height at withers, leg circumference and paunch girth in ram-lambs of the three Egyptian breeds. Moreover, body length, withers height and leg circumference represented good body measurements to predict leg weight of the three Egyptian breeds ($R^2 = 0.70$).

Keywords: Barki; Ossimi; Rahmani; Prediction equations; Body Length; Height at withers; Heart girth; Meat; Bone weight.

482. Does Parity and Nutrition in Early Pregnancy Affect Viability of Embryos in Both Rahmani and Barki Egyptian Sheep?

Abdel-Mageed and M.H. Abd El-Gawad

The aim of this work was to investigate the effects of sheep breed, parity and post-mating nutrition on embryo wastage in early pregnancy. The experimental design was completely randomized and the groups of ewes arranged factorially (2 x 2 x 3) according to the breed (Rahmani or Barki), parity of the ewes (nulliparous or parous) and post-mating nutritional regimen through the first 45 days of pregnancy (70% of the maintenance requirements, maintenance requirements, or 130% of the maintenance requirements). Rahmani ewes recorded significantly higher estimates than Barki ewes in crown-rump length at Days 25 and 45 of pregnancy. At Day 45 of pregnancy, both parity and post-mating nutrition significantly affected body weight, body condition score and backfat thickness of ewes. A clear reduction in pregnancy rate estimates, at Day 45 of pregnancy, were recorded in the under- and the over-nourished ewes compared to the controls. A double-fold of embryonic wastage was recorded in the over-nourished ewes and three folds in the under-nourished ones at Day 45 of pregnancy in comparison with the medium-nourished ewes. Crown-rump length of embryos was higher in the over-nourished animals. The under-nourished ewes had higher P4 level at Days 25 and 45 of pregnancy, while the over-nourished ones recorded lower estimates than the control ewes. Therefore, it is important to control the feeding allowance of ewes in early pregnancy to be around the maintenance requirements to get a considerable proportion of viable embryos.

Keywords: Sheep; Breeds; Parity; Postmating nutrition; Embryo wastage.

Dept. of Dairy Sciences

483. The Flavonoid, Naringenin, Decreases Adipose Tissue Mass and Attenuates Ovariectomy-Associated Metabolic Disturbances in Mice

Jia-Yu Ke, Kara L Kliewer, Essam M Hamad, Rachel M Cole, Kimerly A Powell, Rebecca R Andridge, Shana R Straka, Lisa D Yee and Martha A Belury

Objective: Adverse metabolic changes associated with loss of ovarian function increase the risk of developing metabolic syndrome and non-alcoholic fatty liver disease (NAFLD) in postmenopausal women. Naringenin improves metabolic disturbances in vitro and in vivo. In the present study, we tested the effects of naringenin on metabolic disturbances resulting from estrogen deficiency in ovariectomized mice.

Materials/methods: Ovariectomized C57BL/6 J female mice were fed a control diet (10% calories from fat) for 11 weeks. Mice either continued on the control diet (n=9) or were switched to the control diet supplemented with 3% naringenin (n=10) for the next 11 weeks. Energy expenditure was measured by indirect calorimetry and activity was monitored by infrared beam breaks. Intra-abdominal and subcutaneous adiposity was evaluated by magnetic resonance imaging (MRI). Blood biochemical measures of metabolic response included glucose, insulin, adipokines, and lipids. Lipid content in liver and muscle and expression of relevant genes in adipose tissue, liver, and muscle were quantified.

Results: Ovariectomized mice fed naringenin exhibited lower fasting glucose and insulin levels compared to controls, with over 50% reduction of intra-abdominal and subcutaneous adiposity. Plasma leptin and leptin mRNA in adipose depots were also decreased in mice fed a naringenin diet. Monocyte

chemoattractant protein-1 (MCP1/Ccl2) and interleukin 6 (IL-6/Il6) mRNA expression levels were significantly lower in perigonadal adipose tissue of naringenin-supplemented mice. We also observed that mice fed a naringenin diet had less hepatic lipid accumulation with corresponding alterations of hepatic gene expression associated with de novo lipogenesis, fatty acid oxidation, and gluconeogenesis.

Conclusion: Dietary naringenin attenuates many of the metabolic disturbances associated with ovariectomy in female mice. Electronic supplementary material.

Keywords: Naringenin; Menopause; Obesity; Insulin sensitivity; Adipose tissue inflammation; Fatty liver.

Dept. of Economic Entomology and Insecticides

484. Population Dynamics and Economic Losses Caused By Zeuzera Pyrina, A Cryptic Wood-Borer Moth, in an Olive Orchard in Egypt

Esmat Hegazi, Fredrik Schlyter, Wedad Khafagi, Atwa Atwa, Essam Agamy and Maria Konstantopoulou

1-The leopard moth Zeuzera pyrina L. (ZP) is an invasive pest from Europe of increasing significance in North Africa, in particular for olive cultivation. We followed the temporal dynamics by combined light/pheromone trapping over a 10-year period (2002–2011) in a 240-ha olive farm in Northern Egypt.

2- The ZP had an annual cycle with one or two peak flights, from late April until October. Time series analysis showed a 2-year cycle of trap catch. This cycle is likely related to the 'on/off' bearing pattern of the olive, where years of high and low yield are observed to alternate.

3- Larval damage in both 'on' and 'off' years in the infested trees gave fruit yield losses of 37–42%. The loss was estimated to 2.1–4.8 t/ha among susceptible varieties. The relative losses were the same during on and off years.

4- Infestation of four susceptible and five resistant olive cultivars in different cropping systems varied within and between adjacent plots. The results suggest less infestation by intercropping of resistant varieties, which could assist in ZP management.

5-Both temporal and spatial dynamics strongly influence population dynamics and the dynamics are related to variation in the moth host plant.

Keywords: ARIMA; Leopard moth; Olive; Periodic oscillations; Population dynamics; Zeuzera pyrina.

485. Unbalanced Polyandry in Wild-Caught Ladybirds Harmonia Axyridis (Coleoptera: Coccinellidae)

Mona Awad, Guillaume J. M. Laugier, Anne Loiseau and Oldrˇich Nedveˇd

We investigated the mating and fertilization patterns in one Czech local population of the invasive aphidophagous ladybird Harmonia axyridis (Pallas), sampling the same mixed generations before and after overwintering. Our study using eight microsatellite loci provides the first direct evidence that females of H. axyridis are highly polyandrous in the wild and that they not

only mate multiple times but also use the sperm from multiple males to fertilize their eggs.

Three types of values (minimum number of fathers, estimated number of fathers and effective number of fathers contributing to progeny of one mother) were about two times higher in the spring sample (2.9, 5.2, 3.1), in the peak of their reproduction period, than in the preceding autumn sample (1.6, 2.8, 1.6). The contribution of individual fathers to the number of progeny was highly unbalanced, with a few dominating fathers and many fathers with low number of progeny.

Keywords: Promiscuity; Paternity; Fertilization; Overwintering; Reproduction; Propagule size.

486. Efficacy of Bacillus Thuringiensis and Indigenous Trichogramma Turkistanica for Controlling Lepidopterous Pests on Taify Pomegranate Fruits

S.M. Sayed, G. Elsayed, S.F. Mahmoud1 and O.M. Elzahrany

The impact of Bacillus thuringiensis and native Trichogramma turkistanica on the infestation rates of two lepidopterous pests, Virachola livia and Ectomyelois ceratoniae, was assessed in field experiments conducted in four pomegranate farms distributed in the Taif region of Saudi Arabia. Pomegranate trees were sprayed with B. thuringiensis spores, and indigenous T. turkistanica was inundatively released during the pomegranate fruiting season from April to September of 2014.

The highest infestation rates with E. ceratoniae andV. livia in control and treated trees gradually increased until the end of the season, reaching 79, 54 and 22 % for E. ceratoniae, and 22, 16 and 7%for V. livia in control, Bacillus-treated trees, and Trichogrammatreated trees, respectively.

The mean percentages of fruits infested with E. ceratoniae or V. livia were significantly different between the untreated trees and both the trees treated with Trichogramma and those treated with Bacillus. Moreover, the trees treated with Trichogramma had a lower infestation rate by both E. ceratoniae and V. livia compared to the trees treated with Bacillus.

The number of larvae collected from infested fruits varied from one to two larvae per fruit for both E. ceratoniae and V. livia. Use of Bacillus or native Trichogramma to control these pests can achieve high yields of Taify pomegranate of better quality.

Keywords: Biological control; Lepidoptera; Parasitoid; Native species; Punica granatum.

487. Marigold Thrips Neohydatothrips Samayunkur (Kudô), A New Thrips Species in Egypt Associated with the African Marigold, Tagetes Erecta L.

A.S. Abdel Wahab, M.A.K. El-Sheikh and S. Elnagar

our different thrips species; marigold thrips, Neohydatothrips samayunkur; western flower thrips, Frankliniella occidentalis; tomato thrips, Frankliniella schultzei and onion thrips, Thrips tabaci were recorded on marigold plants in the field. Tagetes erecta L. was grown in the experimental farm, Giza governorate, Egypt. The survey was carried out during mid-April to late July

and from early September to late December 2013. Weekly samples were randomly selected and examined for the presence of the different thrips species. Identification of thrips species was based on morphological characters. Neohydatothrips samayunkur recorded the highest average numbers in both periods of survey, from mid-April to late July and from early September to late December 2013 (189.5 and 143.6 individuals/plant, respectively), while the lowest number was recorded for T. tabaci (4.6 and 5.9 individuals/plant). This is the first report of N. samayunkur in Egypt. Description of the recorded species is given as well as their seasonal abundance on marigold plants.

Keywords: Thrips; Neohydatothrips samayunkur; Egypt; Marigold; Tagetes erecta.

488. Morphological Characteristics of Some Species of Lady-Birds (Coleoptera: Coccinellidae) in Giza Region, Egypt.

Atif, J. Y.; El-Husseini, M. M.; Agamy, E. A.; Ahmed, S. S.

Species from ladybird beetles (Coleoptera: Coccinellidae) were collected from the fields of wheat, barley, alfalfa, beans, mustard, vegetable crops, and ornamental plants at Experiment Station of the Faculty of Agriculture, Cairo University, Giza, Egypt in 2013-2014. Six species (Coccinella undecimpunctata L., Exochomus nigripennis (E.), Hyperaspis marmattani (F.), Rodolia cardinalis (M.), Scymuns syriacus (M.) and Hippodamia variegate (G.)) belong to six genera, from five tribes and three subfamilies were recorded throughout the study and were morphologically identified. Their taxonomic key was also given.

Keywords: Coccinellida; Identification; Morphological Characteristics; Giza; Egypt.

489. Effects and Economics of Different Treatments Against the Tomato Leaf Miner , Tuta Absoluta (Meyrick) (Lepidoptera: Gelechiidae) at Harvesting Time

Meabed, H. A. A.; Amany M. Rizk; N. N. El Hefnawy and E. A. Agamy

Nine field treatments against the tomato leaf miner, Tuta absoluta (Meyrick) (Lepidoptera: Gelechiidae) infesting tomato plants were carried out in Fayoum governorate, Egypt in 2012 and 2013 seasons. In 2012, the best results were obtained by using a combination of the egg parasitoid Trichogramma evanescens West. and the chemical insecticide Coragen 20%. This treatment gave the least % infestation in tomato fruits and the highest yield/ feddan. The treatment of pheromone trap+ Coragen ranked second, while the light trap+ Coragen ranked third. In 2013, T. evanescens + the bio-insecticide Emamectin gave the best results, followed by the Trichogramma+ Coragen and then the pheromone trap + Coragen. Economically, regarding the costs of application and obtained yield of tomato crop, Trichogramma+ Coragen ranked first, followed by Trichogramma + Emamectin.

Keywords: Tomato; Tuta absoluta; Infestation; Harvesting time; Control; Economics.

490. Indirect Toxicity of Treated Prey with Two Chitin Synthesis Inhibitors , on Pre - Imaginal Stages of Coccinella Undecimpunctata L. (Coleoptera : Coccinellidae) Under Laboratory and Field Conditions

Tabozada E O K, S A El Arnaouty and A H El Heneidy

A study on the indirect toxicity of two chitin synthesis inhibitors namely, Cascade and Match, against larval and pupal stages of the predatory species Coccinella undecimpunctata L., reared on treated 2nd instar larvae of the cotton leaf worm, Spodoptera littoralis (Boisd.) under laboratory and field conditions was carried out. The experiments were conducted using a contact method, under the laboratory conditions of 25°C±1, 65% R.H. and 16L: 8D photoperiods. Both compounds were tested using four serial concentrations i. e., 1.5, 3.1, 6.3 and 12.5 ppm. Results indicated that Cascade and Match treated preys increased larval duration of the predator compared to the control, Cascade did not affect the larval duration as much as Match did at any of the four tested concentrations. Both compounds decreased larval feeding capacity of the predator in comparison to the control at all larval instars. In that respect, Cascade reduced significantly the feeding capacity more than Match did at all larval instars. Effect of Cascade and Match on pupal duration was significant at the lower concentrations and had no effect at higher ones compared to the control. C. undecimpunctata pupal weight increased gradually with increasing the concentration of Match and was significantly differing from the control. It could be concluded that both tested chitin synthesis inhibitors can be used in Integrated Pest Management in cotton growing areas with acceptable safety to C. undecimpunctata.

Keywords: Coccinella undecimpunctata; Spodoptera littoralis; Chitin synthesis inhibitors; Cascade; Match;Toxicity.

491. Dispersal and Maintenance of Neoseiulus Cucumeris Oudemans and Amblyseius Swirskii Athias-Henriot (Acari: Phytoseiidae) to Control Thrips in Greenhouse Crops as Influenced by Micro Habitat Environment

Fatnassi H., S A El Arnaouty,R.Brun,J.Pizzol,M.Kortam,C.Metay and C.Poncet

The present study aimed to investigate the effect of microclimate parameters within the plant cover as well as their effects on dispersal of the bioagents Neoseiulus cucumerisOudemansand Amblyseius swirskiiAthias-Henriot (Acari: Phytoseiidae)at the plant level. It was a preliminary step to microclimate control in order to increase the bioagent efficacy. Effect of humidity was studied in priority, as it seems to have a preponderant role. It consisted in monitoring the dispersal of bioagents in parallel with microclimatic heterogeneity characterization at the plant level. The results highlighted that (i) the climatic parameters varied spatially within the plant according to the level: (ii) At high relative humidity, one week after release, both predators; A. swirskii and N. cucumeris showed a density increase on the plant,

while under dry conditions the contrary occurred, and (iii) High humidity was suitable for both predators.
Keywords: Microclimate heterogeneity; Neoseiulus cucumeris; Amblyseius swirskii; Plant; Greenhouse.

Dept. of Food Science and Technology

492. Solar Drying of Whole Mint Plant Under Natural and Forced Convection

Y.I. Sallam , M.H. Aly, A.F. Nassar and E.A. Mohamed

Journal of Advanced Research, 6: 171-178 (2015) IF: 3

Two identical prototype solar dryers (direct and indirect) having the same dimensions were used to dry whole mint. Both prototypes were operated under natural and forced convection modes. In the case of the later one the ambient air was entered the dryer with the velocity of 4.2 m s^{-1}.
The effect of flow mode and the type of solar dryers on the drying kinetics of whole mint were investigated. Ten empirical models were used to fit the drying curves; nine of them represented well the solar drying behavior of mint. The results indicated that drying of mint under different operating conditions occurred in the falling rate period, where no constant rate period of drying was observed. Also, the obtained data revealed that the drying rate of mint under forced convection was higher than that of mint under natural convection, especially during first hours of drying (first day). The values of the effective diffusivity coefficient for the mint drying ranged between 1.2×10^{-11} and 1.33×10^{-11} m^{2} s^{-1}.
Keywords: Mint; Solar drying; Natural convection; Forced convection; Thin layer drying; Effective diffusivity.

493. A Short Extraction Time of High Quality Hydrodistilled Cardamom (Elettaria Cardamomum L. Maton) Essential Oil Using Ultrasound as A Pretreatment

Nashwa F.S. Morsy

Industrial Crops and Products, 65: 287-292 (2015) IF: 2.837

The influence of ultrasonic assisted extraction (UAE) followed by hydrodistillation of Elettaria cardamomum L. seeds was investigated.
The yield, volatile components and sensory characteristics of the extracted essential oils (EO) were evaluated. Power of ultrasonic and time of sonication were optimized. The chemical composition of the EO was identified by gas chromatography–mass spectrometry (GC–MS). Results revealed that the major components of cardamom essential oils varied between 26.59% and 39.34% for 1,8-cineole, and between 22.94% and 40.56% for a-terpinyl acetate, depending on the extraction conditions. The UAE technique facilitated short time extraction, improved extraction efficiency and produced good quality cardamom essential oil.
Keywords: Cardamom; Essential oil; Ultrasonic; Hydrodistillation ; A-Terpinyl acetate; 1,8-Cineole.

494. Keeping Quality of Frozen Beef Patties by Marjoram and Clove Essential Oils

M.E. Abdel-Aziz and Nashwa F.S. Morsy

Journal of Food Processing and Preservation, 39: 956-965 (2015) IF: 1.159

The effects of clove (Syzygium aromaticum) and marjoram (Origanum majorana L.) essential oils on color stability, lipid oxidation, sensorial properties and microbiological quality of beef burger prepared with sunflower oil during frozen storage at -18C for 3 months were investigated.
The burger was formulated with clove and marjoram essential oils at 250 and 500 mg/kg. Patties formulated with marjoram essential oil showed significantly lower pH values, aerobic plate counts and psychrotrophic counts. Results indicated that marjoram and clove essential oils had a powerful antioxidant activity. Since, malondialdehyde content did not exceed 0.5 mg/kg patty after 3 months of frozen storage. No significant variations in taste and odor scores between control samples and those formulated with clove oil or marjoram oil at 250 mg/kg over different months of frozen storage were noticed. The investigated essential oils had a protective effect on color properties of the burger samples.
Keywords: Marjoram; Clove; Patties; Antioxidants.

Dept. of Genetics

495. Quantitative Trait Loci and Candidate Genes Underlying Genotype by Environment Interaction in The Response of Arabidopsis Thaliana to Drought

Mohamed El-Soda,Willem Kruijer, Marcos Malosetti, Maarten Koornneef and Mark G. M. Aarts

Plant, Cell and Environment, 38: 585-599 (2015) IF: 6.96

Drought stress was imposed on two sets of Arabidopsis thaliana genotypes grown in sand under short-day conditions and analysed for several shoot and root growth traits. The response to drought was assessed for quantitative trait locus (QTL) mapping in a genetically diverse set of Arabidopsis accessions using genome-wide association (GWA) mapping, and conventional linkage analysis of a recombinant inbred line (RIL) population. Results showed significant genotype by environment interaction (G ×E) for all traits in response to different watering regimes.
For the RIL population, the observed G×E was reflected in 17 QTL by environment interactions (Q×E), while 17 additional QTLs were mapped not showing Q×E. GWA mapping identified 58 single nucleotide polymorphism (SNPs) associated with loci displaying Q×E and an additional 16 SNPs associated with loci not showing Q×E. Many candidate genes potentially underlying these loci were suggested.
The genes for RPS3C and YLS7 were found to contain conserved amino acid differences when comparing Arabidopsis accessions with strongly contrasting drought response phenotypes, further supporting their candidacy. One of these candidate genes co-located with a QTL mapped in the RIL population.
Keywords: Genome-Wide association mapping; G×E;QTL; QXE.

Dept. of Plant Pathology

496. Biological Products to Control Grapevine Die Back Pathogen

Om Hashem M. El-Banna, Wafaa M. Haggag and Noran A. Al-Ansary

Biological intervention can range from application of biological products to enhance the resistant of crops to control plant pathogens. Isolates of Paeniobacillus polymyxa, Brevibacillus brevis, Pseudomonas putida, Pseudomonas fluorescens and Streptomyces griseus were evaluated to enhance resistance against die back disease caused by Botryoplodia theobromae on grapevine transplanting inoculated with pathogen and sprayed with bioagents in the greenhouse experiment. P. putida was the highest effective treatment followed by P. polymyxa and Brevibacillus brevis respectively.

Keywords: Biological products; Grapevine die-back disease.

Dept. of Soil Sciences

497. Elemental Characterization of Wild Edible Plants from Countryside and Urban Areas

Massimiliano Renna, Claudio Cocozza, Maria Gonnella Hamada Abdelrahman and Pietro Santamaria

Thirteen elements (Na, K, Ca, Mg, Fe, Mn, Cu, Zn, Cr, Co, Cd, Ni and Pb) in 11 different wild edible plants (WEP) (Amaranthus retroflexus, Foeniculum vulgare, Cichorium intybus, Glebionis coronaria, Sonchus spp., Borago officinalis, Diplotaxis tenuifolia, Sinapis arvensis, Papaver rhoeas, Plantago lagopus and Portulaca oleracea) collected from countryside and urban areas of Bari (Italy) were determined. B.officinalis and P.rhoeas could represent good nutritional sources of Mn and Fe, respectively, as well as A.retroflexus and S.arvensis for Ca. High intake of Pb and Cd could come from P.lagopus and A.retroflexus (1.40 and 0.13 mg kg-1 FW, respectively). WEP may give a substantial contribution to the elements intake for consumers, but in some cases they may supply high level of elements potentially toxic for human health. Anyway, both ANOVA and PCA analyses have highlighted the low influence of the harvesting site on the elements content.

Keywords: Nutritional value; Essential elements; ICP-OES; Local habit; Food risk; EC Regulation.

Dept. of Vegetable Crops

498. Impact of Bio- and Organic Fertilizers on Potato Yield, Quality and Tuber Weight Loss After Harvest

Sayed F. El-Sayed, Hassan A. Hassan and Mohamed M. El-Mogy

This study was conducted to assess whether organic fertilization alone or with bio-fertilization could replace mineral fertilization in potato production with no adverse effect on quantity or quality. Therefore, two field experiments were conducted at Maba Farm, Cairo—Alexandria Desert Road in Egypt to evaluate the impact of mineral, organic, and bio-fertilizers on a sandy soil on yield, quality, and weight loss after harvest of potato tubers. Control plots were treated with recommended rates of mineral fertilizer + 11.9 t ha^{-1} compost and the other treatments were 23.8 t ha^{-1} compost, 23.8 t ha^{-1} compost + bio-fertilizer, 11.9 t ha^{-1} compost + bio-fertilizer, 50% of mineral fertilizers + 23.8 t ha^{-1} compost, 50% of mineral fertilizers + 23.8 t ha^{-1} compost $^{+}$ bio-fertilizer, 50% of mineral fertilizers + 11.9 t ha^{-1} compost $^{+}$ biofertilizer, and 35.7 t ha^{-1} compost. There were significant increases in the total and marketable yield of potato crops from plots treated with 50% of the recommended mineral fertilizers plus 23.8 t ha^{-1} compost with or without bio-fertilizer as well as from plots that received compost at the rate of 35.7 t ha^{-1}, compared with plots treated with full dose of mineral fertilizer plus 11.9 t ha^{-1} compost (control). Compost at 23.8 t ha^{-1} + bio-fertilizer resulted in a significant increase in marketable yield. Nevertheless, total yield obtained from plots treated with compost at 23.8 t ha^{-1} alone or plus bio-fertilizer did not differ significantly from the conventional control treatment. Compared with conventional fertilizer treatment, plots receiving compost at 23.8 t ha^{-1} alone or at 11.9 t ha^{-1} plus 50% mineral fertilizers and bio-fertilizer showed a lower nitrate content in potato tubers. Bio-fertilizer + organic fertilizer at a rate of 11.9 t ha^{-1} reduced marketable yield by 11.8% and total yield by 9.2%, compared with using organic fertilizer at a rate of 23.8 t ha^{-1} compost. So, for export of organic potato, which is characterized by 2–3-fold higher product prices, bio-fertilizer in the present study could not be an alternative to organic fertilizer. The highest nitrate content of tubers was obtained in control plots and plots that received 35.7 t ha^{-1} compost. Conventional fertilizer showed significantly higher weight loss of potato tubers during cold storage than all other treatments. Tuber K content was low in organic potato, whereas no effect was recorded on tuber N, P, or starch content. Hence, these results suggest that organic production of potato (at the level of 23.8 t ha^{-1} compost) could be an alternative to conventional production without significant reduction in yield, and with low nitrate content and better storability.

Keywords: Bio-Fertilizer ; Compost ; Organic fertilizer ; Solanum tuberosum.

Faculty of Veterinary Medicine

Dept. of Anatomy and Embryology

499. Training of Upper Respiratory Endoscopy in the Horse Using Preserved Head and Neck

Fawzy A. Elnady, Eldessouky Sheta, Ashour K. Khalifa and Hamdy Rizk

Altex-Alternatives to Animal Experimentation, 32: 384-387 (2015) IF: 5.467

Endoscopy of the upper respiratory tract (URT) is one of the minimally invasive techniques used for diagnosis and treatment of diseases in horses. Training in the use of an endoscope follows an apprenticeship approach, with extensive practice needed to help achieve effective skills acquisition. The use of live animals for training presents the risk of injury to both the animal and the trainee. The increased number of students and practitioners, a shortage of facilities, and limited time available from expert clinicians add more challenges to the training process. In this work, we focused on the development of a preserved head and neck model that can be used as an effective training tool for training novices on the basics of upper respiratory endoscopy. The aim of the training is to become familiar with handling the endoscope and identification of the endoscopic depictions of normal anatomical structures encountered in the upper respiratory tract. Using the model, anatomical structures were clearly visible, recognized by their shape, architecture and topographical location. The model solved many of the aforementioned practical challenges, and has great potential as a replacement alternative to the use of live animals. There are opportunities for the application of such models intraining other clinical skills and for a variety of species.
Keywords: Veterinary training; Alternative model; Replacement; Respiratory endoscopy; Horse anatomy.

Dept. of Biochemistry

500. Expression, Genetic Localization and Phylogenic Analysis of Naplr in Piscine Streptococcus Dysgalactiae Subspecies Dysgalactiae Isolates and Their Patterns of Adherence.

M. Abdelsalam, M. Fujino, A.E. Eissa, S.C. Chenand M. Warda

Journal of Advanced Research, 6: 747-755 (2015) IF: 3

Streptococcus dysgalactiae, the long recognized mammalian pathogen, has currently received a major concern regarding fish bacterial infection. Adhesion to host epithelial cells and the presence of wall-associated plasminogen binding proteins are prerequisites to Streptococcus infection. This is the first study of the occurrence of nephritis-associated plasminogen-binding receptor (NAPlr) and a-enolase genes in piscine S. dysgalactiae subspecies dysgalactiae (SDSD) isolates. Further characterization of surface localized NAPlr of fish SDSD revealed a similar immune-reactive band of 43 KDa as that from porcine S. dysgalactiae subsp. equisimilis (SDSE). The phylogenetic analysis revealed that NAPlr of fish SDSD is more associated with those of mammalian SDSE and Streptococcus pyogenes rather than of other streptococci. Our findings warrant public attention to the possible implication of these virulence genes in dissemination of SDSD to different tissues of infected hosts and

to get advantage to new niches. The SDSD adherence patterns were also studied to better understand their pathogenicity. The patterns of adherence of SDSD on two different cell lines showed a different pattern of adherence. Such difference gives an insight about the variance in host susceptibility to infection.
Keywords: Adherence pattern; NAPlr gene; Piscine S. dysgalactiae subsp; Dysgalactiae; Virulence traits; α-enolase gene.

501. Ameliorative Influence of Green Tea Extract on Copper Nanoparticle-Induced Hepatotoxicity in Rats

Marwa A. Ibrahim, A A Khalaf, Mona K. Galal, Hanan A. Ogaly and Azza H.M. Hassan

Nanoscale Research Letters, 10: 363-371 (2015) IF: 2.779

The potential toxicity of copper nanoparticles (CNPs) to the human health and environment remains a critical issue. In the present study, we investigated the protective influence of an aqueous extract of green tea leaves (GTE) against CNPs-induced (20–30 nm) hepatotoxicity. Four different groups of rats were used: group I was the control, group II received CNPs (40 mg/kg BW), group III received CNPs plus GTE, and group IV received GTE alone. We highlighted the hepatoprotective effect of GTE against CNPs toxicity through monitoring the alteration of liver enzyme activity, antioxidant defense mechanism, histopathological alterations, and DNA damage evaluation. The rats that were given CNPs only had a highly significant elevation in liver enzymes, alteration in oxidant-antioxidant balance, and severe pathological changes. In addition, we detected a significant elevation of DNA fragmentation percentage, marked DNA laddering, and significance over expression of both caspase-3 and Bax proteins. The findings for group III clarify the efficacy of GTE as a hepatoprotectant on CNPs through improving the liver enzyme activity, antioxidant status, as well as suppressing DNA fragmentation and the expression of the caspase-3 and Bax proteins. In conclusion, GTE was proved to be a potential hepatoprotective additive as it significantly ameliorates the hepatotoxicity and apoptosis induced by CNPs.
Keywords: CNPs; Liver; Apoptosis oxidative stress; Green tea extract; rats.

502. Influence of Green Tea Extract on Oxidative Damage and Apoptosis Induced by Deltamethrin in Rat Brain

Hanan A. Ogaly a, A.A. Khalaf, Marwa A. Ibrahima, Mona K. Galal and Reham M. Abd-Elsalam

Neurotoxicology and Teratology, 50: 23-31 (2015) IF: 2.762

In the present study,we investigated the protective effect of an aqueous extract of green tea leaves (GTE) against neurotoxicity and oxidative damage induced by deltamethrin (DM) in male rats. Four different groups of rats were used: the 1st group was the vehicle treated control group, the 2nd group received DM (0.6 mg/kg BW), the 3rd group received DMplus GTE, and the 4th received GTE alone (25 mg/kg BW). The brain tissues were collected at the end of the experimental regimen for subsequent investigation. Rats thatwere givenDMhad a highly significant elevation in MDA content, nitric oxide concentration, DNA fragmentation and expression level of apoptotic genes, TP53 and COX2. Additionally, a significant reduction in the total

antioxidant capacity in the second groupwas detected. The findings for the 3rd group highlight the efficacy of GTE as a neuro-protectant inDMinduced neurotoxicity through improving the oxidative status and DNA fragmentation as well as suppressing the expression of the TP53 and COX2 genes. In conclusion, GTE, at a concentration of 25 mg/kg/day, protected against DM-induced neurotoxicity through its antioxidant and antiapoptotic influence; therefore, it can be used as a protective natural product against DM-induced neurotoxicity.
Keywords: Deltamethrin; Green tea extract; Brain; Apoptosis; Oxidative damage.

Dept. of Clinical Pathology

503. Immunomodulatory and Antiparasitic Effects of Garlic Extract on Eimeria Vermiformis-Infected Mice

Khalil AM, Yasuda M, Farid AS, Desouky MI, Mohi-Eldin MM, Haridy M and Horii Y.

We investigated the immunomodulatory and parasiticidal effects of garlic extract on coccidiosis caused by Eimeria vermiformis infection in male ICR mice. One group received garlic extract daily until the end of the experiment by the oral route from 10 days prior to oral infection with 300 sporulated E. vermiformis oocysts (infected-garlic+). The other group served as a control positive with E. vermiformis infection alone (infected-garlic-). In the infected-garlic+ group, garlic extract treatment induced a significant reduction in fecal oocyst output when compared with the infected-garlic- group. Histopathological, immunohistochemical, and gene expression analysis for inflammatory cytokines in ileal tissues showed that the garlic extract treatment impaired intracellular development of E. vermiformis during the early stages by increasing the number of intraepithelial CD8+T cells and decreasing IL-10 expression. This induced cell cytotoxicity which was reflected by a decrease in oocyst numbers in the intestinal villi and the feces, indicating anticoccidial effects of the garlic extract. However, further studies to explore the precise mechanism of the observed effects of garlic treatment during Eimeria infection are needed to verify our results
Keywords: Eimeria vermiformis; Garlic; Intraepithelial lymphocytes; CD8+ T; Coccidiosis; Immunohistochemistry.

Dept. of Fish Diseases and Management

504. Genetic Diversity of Geographically Distinct Streptococcus Dysgalactiae Isolates from Fish

M. Abdelsalam, A.E. Eissa and S.-C. Chen

Streptococcus dysgalactiae is an emerging pathogen of fish. Clinically, infection is characterized by the development of necrotic lesions at the caudal peduncle of infected fishes. The pathogen has been recently isolated from different fish species in many countries. Twenty S. dysgalactiae isolates collected from Japan, Taiwan, Malaysia and Indonesia were molecularly characterized by biased sinusoidal field gel electrophoresis (BSFGE) using SmaI enzyme, and tuf gene sequencing analysis. DNA sequencing of ten S. dysgalactiae revealed no genetic variation in the tuf amplicons, except for three strains. The

restriction patterns of chromosomal DNA measured by BSFGE were differentiated into six distinct types and one subtype among collected strains. To our knowledge, this report gives the first snapshot of S. dysgalactiae isolates collected from different countries that are localized geographically and differed on a multinational level. This genetic unrelatedness among different isolates might suggest a high recombination rate and low genetic stability.
Keywords: Streptococcus dysgalactiae; Epidemiology; Tuf gene Sequencing; BSFGE.

505. Eubiotic Effect of A Dietary Acidifier (Potassium Diformate) on the Health Status of Cultured Oreochromis Niloticus

Nermeen M. Abu Elalaa and Naela M. Ragaa

In connection with the global demand for safe human food and the production of environmentally friendly aquaculture products, acidifiers are natural organic acids and salts that have received considerable attention as animal-feed additives. The current study was designed to evaluate the effects of potassium diformate (KDF) on the growth performance and immunity of cultured Oreochromis niloticus (O. niloticus). Four iso-nitrogenous and iso-caloric rations containing graded levels of KDF, including 0% (control basal diet), 0.1%, 0.2% and 0.3%, were fed separately to four equal fish groups (30 fish/group with an initial body weight of 53.49 ± 6.15 g) for sixty days. At the end of the experimental period, the fish groups fed on 0.2% and 0.3% KDF exhibited significant improvements in their feed intake, live weight gain, specific growth rate, feed conversion ratio and protein efficiency ratio, with concomitant improvement of their apparent protein digestibility ($p < 0.05$). Dietary supplementation of 0.3% KDF appeared to stimulate the beneficial intestinal flora; a proliferation was observed of indigenous probionts (Eubiosis) associated with the relative activation of cellular and humeral innate immunity (phagocytic activity/index, nitroblue tetrazolium reduction test and serum/gut mucous lysozyme activity). The cumulative mortality of the fish groups fed on KDF and challenged orally with Aeromonas hydrophila was lower than that of the control group. The resistance against diseases increased with dietary KDF in a dose-dependent manner. Thus, we conclude that the use of acidifiers can be an efficient tool to achieve sustainable, economical and safe fish production.
Keywords: Acidifiers; Growth performance; Eubiosis; Gut Probionts; Innate immunity; Challenge test.

506. Evolution of Probiotics in Aquatic World: Potential Effects, the Current Status in Egypt and Recent Prospectives

Mai D. Ibrahem

The increase in the human population in addition to the massive demand for protein of animal origin forced the authorities to seek for additional sources of feed supplies. Aquaculture is the world worth coming expansion to compensate the shortage in animal protein. Feed in aquaculture plays an important role in the production cycle and exert threshold on both practical and

economic aspects. Feed additive sectors are expanding day after day to achieve better growth and health for fish and shrimp and to meet the potential requirements of the culturists. Probiotic proved its successes in human and animal feeding practices and recently gained attention in aquaculture; it has beneficial effects in diseases control and competes with various environmental stressors as well as to promote the growth of the cultured organisms. Probiotics have the privilege to manipulate the non-specific innate immunity among fishes, hence help them into resist many pathogenic agents and are actively used worldwide. The present review is an informative compilation of the probiotics, their mode of action and their useful effects on fishes. The review also highlights the status of probiotics in aquaculture of Egypt, probiotic recent prospective for the possible role of probiotics in fish external and internal environment.

Keywords: Probiotic; Definition growth immunity Reproduction; Environment.

507. Assessment of the Immune-Modulatory and Antimicrobial Effects of Dietary Chitosan on Nile Tilapia (Oreochrmis Niloticus) with Special Emphasis to its Bio-Remediating Impacts

Nermeen M. Abu-Elala, Samah H. Mohamed, Manal M. Zaki and Alaa Eldin Eissa

Fish, pathogen and environment are three counterparts who are sharing the same circle of life. To keep fish up to their optimal health, environment should be competently improved and pathogen count/virulence should be seized. Using of bioactive immunostimulants to achieve these objectives is the hypothesis under assessment. Thus, the present study was performed to evaluate the use of shrimp shells derived chitosan as an immunostimulant as well as preventive regime against Aeromonas hydrophila infection of Nile tilapia and to assess its antibacterial/aquatic bio-remediating effects. Results achieved by feeding 1% chitosan as preventive/therapeutic regimes have revealed a remarkably enhanced several innate immunological parameters (e.g., Phagocytic activity/index, NBT, Lysozyme activity and ACH50), increased resistance against A. hydrophila and strikingly improved water quality compared to the 0.5 and 2% chitosan containing diets. Conclusively, experimental results suggest the commercial usage of chitosan as an efficient immunostimulant and bio-remediating agent in aquaculture.

Keywords: Bio-Remediation; Chitosan; Immunostimulant; Innate immunity; Nile tilapia.

508. Comparative Synthesis and Antimicrobial Action of Silver Nanoparticles and Silver Nitrate

Dina A. Mosselhy, Mohamed Abd El-Aziz, Magdy Hanna, Mohamed A. Ahmed, Mona M. Husien and Qingling Feng

The high wave of antibiotic bacterial resistance has addressed an importance for administration of different antibacterial agents, as silver nanoparticles (Ag NPs). However, many investigators still suffer conflict in the mechanistic antimicrobial action of Ag NPs and Ag^+ ions. In this regard, our study investigated the comparative antimicrobial action of different sizes of Ag NPs as 8

(nAg1) and 29 (nAg2) nm, in comparison with silver nitrate (AgNO3) against five different bacterial species; Aeromonas hydrophila (A. hydrophila), Pseudomonas putida (Ps. putida), Escherichia coli (E. coli), Staphylococcus aureus (S. aureus), and Bacillus subtilis (B. subtilis) using agar diffusion assay and minimum inhibitory concentration (MIC). The key role of the size of nanomaterials was detected, as the smaller Ag NPs (nAg1) showed more antimicrobial action than the larger particles. Transmission electron microscopy (TEM) studies demonstrated the different mechanistic antibacterial actions of Ag NPs and AgNO3. The effect of combining Ag NPs with antibiotics was also investigated. Synergistic effect of combining Ag NPs with ampicillin was detected against S. aureus, in a size-dependent manner as well. To summarize, our results point towards the major role played by the size of Ag NPs in their antimicrobial effects and the different toxic mechanisms of actions induced by Ag NPs and AgNO3.

Keywords: Synthesis; Silver; Nanoparticlesk; Ions antimicrobial Microbiology; Health and environmental effects.

509. Comparative Analysis of Virulence Genes, Antibiotic Resistance and GyrB-Based Phylogeny of Motile Aeromonas Species Isolates from Nile Tilapia and Domestic Fowl

N. Abu-Elala, M. Abdelsalam, Sh. Marouf and A. Setta

The nucleotide sequence analysis of the gyrB gene indicated that the fish Aeromonas spp. isolates could be identified as Aeromonas hydrophila and Aeromonas veronii biovar sobria, whereas chicken Aeromonas spp. isolates identified as Aeromonas caviae. PCR data revealed the presence of Lip, Ser, Aer, ACT and CAI genes in fish Aer. hydrophila isolates, ACT, CAI and Aer genes in fish Aer. veronii bv sobria isolates and Ser and CAI genes in chicken Aer. caviae isolates. All chicken isolates showed variable resistance against all 12 tested antibiotic discs except for cefotaxime, nitrofurantoin, chloramphenicol and ciprofloxacin, only one isolate showed resistance to chloramphenicol and ciprofloxacin. Fish Aeromonads were sensitive to all tested antibiotic discs except amoxicillin, ampicillin–sulbactam and streptomycin.

Keywords: Aeromonas; Antibiotic resistance; Chicken; Nile Tilapia; Virulence genes.

510. Molecular and Immunohistochemical Diagnosis of Photobacterium Damselae Subspecies Piscicida During Naturally Ocuuring Disease in Egypt

Nermeen M. Abu-Elala, Reham M. Abd-Elsalam and Mohamed S. Marzouk

In marine aquaculture industry, photobacteriosis caused by Photobacterium damselae subspecies piscicida, Phdp is a globally significant disease. A number of clinical photobacteriosis outbreaks among yearling cultured and broodstocks of gilthead sea bream were sampled and submitted to our laboratory during the summer and autumn of 2013. The tissues of infected fish were subjected to an ordinary bacteriological identification and were

analyzed using the polymerase chain reaction and immunohistochemistry techniques. The results indicated that the selective primers which have been designed for detecting the gene encoding the apoptotic induced protein, AIP56 represent a powerful tool for sensitive and specific detection of virulent strains of Phdp. AIP56 toxin triggers apoptosis of host macrophages and neutrophils, contributing to the lesions observed during the pathological investigation. Immunohistochemistry allows bacterial identification and antigen expression to be directly correlated to the disease; the immune-positive bacteria were detected in gills, liver, kidneys, spleen and brain tissues in acute photobacteriosis. These also appeared in the necrotic areas of the granulomas of chronically infected fish. Molecular and immunohistochemical methods were useful as research and diagnostic tools in different stages of the disease; moreover they appear to have enormous potential in retrospective epidemiological investigations.
Keywords: Pathology; Photobacteriosis; Gilthead sea Bream.

511. Impacts of Extreme Cold Water Conditions and Some Bacterial Infections on Earthen-Pond Cultured Nile Tilapia, Oreochromis Niloticus

Elgendy MY, Moustafa M, Gaafar AY and Ibrahim TB

Tilapia aquaculture is vulnerable to adverse impacts of unfavorable environmental conditions and microbial agents. Over-wintering is a serious economic challenge in tilapia farming. Exposure to extreme cold water temperature has long been considered a significant constraint to tilapia fish survival. Unprecedented huge mortalities approached 98 % have been recorded only in earthen-pond cultured tilapia, Oreochromis niloticus within Barsiq farm, northern Egypt during the period from December 2013 to February 2014. Other co-cultured fishes weren't surrendered. Succumbed fishes showed distinctive skin darkness and few haemorrhagic patches on the external body surface. The synergistic effects of environmental deterioration and opportunistic pathogens have been accused for these substantial losses. Water temperature approached detrimental levels 5.2 °C. Mortalities were severe in young-aged tilapia 95 %. Losses approached high rats 98 % particularly in shallow water ponds 55 cm in depth compared to 30 % in other ponds (more than 100 cm). The values recorded for dissolved oxygen, NH3, NO2 and NO3 were fare from the optimum recommended levels; 3.5 mg/L, 1.03 mg/L, 0.75 mg/L and 10.1 mg/L respectively. The magnitude of stress formula exaggerated by existence of unfavorable levels of some heavy metals. Vibrio anguillarum and Aeromonas hydrophila were isolated from succumbed fishes.
Keywords:Oreochromis; Niloticus; Extreme cold water conditions; Bacterial infections; High mortalities.

512. Investigations Into the Potential Causes of Mass Kills in Mari-Cultured Gilthead Sea Bream (Sparus Aurata) at Northern Egypt

M Moustafa, AE Eissa, AM Laila, AY Gaafar, IMK Abumourad and MY Elgendy

Infectious agents are potential causes of mass kills among cultured fish populations worldwide. The study was carried out through the course of two outbreaks targeted gilthead sea bream, Sparus aurata, cultured in two models of mari-culture systems at northern Egypt, floating net-cages and earthen ponds during 2012. Affected fish farms showed unique threatening seasonal episodes of high mortalities. Disease problems recorded during this period were investigated, focusing on phenotypic, molecular characterization and histopathological alterations. Total number of 100 moribund and/or freshly dead fish samples showing picture of clinical septicemia were inspected through the course of these epidemics. Vibrio alginolyticus was the most predominant bacterial pathogen 28.57 % followed by streptococcus agalactiae 24.48 %, Pseudomonas fluorescens 18.36 % and Vibrio vulnificus 16.32 %. Infections attributed to Tenacibaculum maritimum recorded the lowest rate 12.24 %. PCR yielded specific amplicons identical for the size of the target gene sequence characteristic for each bacterial isolate. Circulatory, degenerative, proliferative and necrotic changes were evident in histopathological examination. Disease conditions were exacerbated with the existence of unfavorable water quality measures.
Keywords: Mass Kills; Gilthead sea bream; Bacterial pathogens; PCR; Water quality.

Dept. of Food Hygeine And Control

513. Improving yhe Antimicrobial Efficacy of Organic Acids Against Salmonella Enterica Attached to Chicken Skin Using Sds with Acceptable Sensory Quality

Hamdy M.B.A. Zaki, Hussein M.H. Mohamed and Amal M.A. El-Sherif

The objective of the current study was to use sodium dodecyl sulfate (SDS) for enhancing the lethality of organic acids against Salmonella enterica, so that lower concentrations of organic acids can effectively eliminate the pathogen from chicken surfaces. Cell suspension of S. enterica Kentucky was prepared, attached into the skin and treated by dipping in organic acids (Lactic, Levulinic, and Acetic; 10e20 g/kg), SDS (5e10 g/kg) or their combinations for 1e3 min. Lactic acid revealed the highest bactericidal efficacy, however, levulinic acid showed the lowest bactericidal efficacy. Different combinations of SDS with organic acids resulted in synergistic inactivation of S. enterica Kentucky attached to chicken skin. More than 5 log reduction of S. enterica Kentucky were achieved by combinations of lactic acid or acetic acid with SDS. Sensory characteristics of chicken drumsticks treated with the most effective combinations of organic acids and SDS were satisfactory. Therefore, combining organic acids specially lactic or acetic with SDS might be suitable for application by chicken processors for effective decontamination of chicken carcasses or cuts.
Keywords: Organic acids; Chicken; Sodium dodecyl sulfate; Salmonella enterica;Skin attachment model.

Dept. of Microbiology

514. Macrocyclic Peptidomimetics with Antimicrobial Activity: Synthesis, Bioassay, and Molecular Modeling Studies

Mohamed A. Ibrahim, Siva S. Panda, Alexander A. Oliferenko ,Polina V. Oliferenko, Adel S. Girgis, Mohamed Elagawany, F. Zehra Küçükbay, Chandramukhi S. Panda, Girinath G. Pillai, Ahmed Samir, Kaido Tämm, C. Dennis Hall and Alan R. Katritzky

Novel, cyclic peptidomimetics were synthesized by facile acylation reactions using benzotriazole chemistry. Microbiological testing of the synthesized compounds revealed an exceptionally high activity against Candida albicans with a minimum inhibitory concentration (MIC) two orders of magnitude lower than the MIC of the antifungal reference drug amphotericin B. A strikingly high activity was also observed against three Gram-negative bacterial strains (Pseudomonas aeruginosa, Klebsiella pneumoniae and Proteus vulgaris), two of which are known human pathogens. Thus the discovered chemotype is a potential polypharmacological agent. The toxicity against mammalian tumor cells was found to be low, as demonstrated in five different human cell lines (HeLa, cervical; PC-3, prostate; MCF-7, breast; HepG2, liver; and HCT-116, colon). The internal consistency of the experimental data was studied using 3D-pharmacophore and 2D-QSAR
Keywords: Macrocyclic; Peptidomimetics; Antimicrobial.

515. Relevance of Biofilm Formation and Virulence of Different Species of Coagulase - Negative Staphylococci to Public Health

K. M. Osman, K. A. Abd El-Razik, H. S. H. Marie and A. Arafa

The ability of biofilm formation seems to play an essential role in the virulence of coagulase-negative staphylococci (CNS). The present work aimed to: (a) evaluate the biofilm-forming ability of different strains of CNS field isolates; (b) evaluate their virulence potential through the assessment of the Madin–Darby canine kidney (MDCK) cytotoxicity assay; (c) determine the frequency of biofilm-associated genes among these CNS isolates. Biofilm markers associated with biofilm formation and MDCK cells cytotoxicity were compared to find possible associations with pathogenicity. CNS isolates (n=94) belonging to 11 different species were tested for slime production using the tube test (TA) and the Congo red agar plate test (CRA), while the presence of icaA and icaD genes were evaluated by d-PCR. Two points were addressed for the first time: (1) the specific relationship between slime phenotype and icaD gene expression; (2) the specific relationship between slime phenotype, icaAD genes, and MDCK cytotoxicity. The proportion of biofilm-positive/ icaD-positive versus biofilm-positive/icaD-negative strains was 9:0 and 9:0 (81.8 %) by the TA and CRA, which clearly indicates that icaD was a more reliable gene to be accounted for in the biofilm formation. MDCK recorded a higher proportion than that recorded by the CRA and TA results (MDCK-positive/icaD-positive versus MDCK-positive/ica- D-negative 10:0, 90.9 %).

Evaluation of the ica operon, CRA plate test, TA, and MDCK can contribute to the high clinical impact in the management of antibiotic therapy, in infections associated with devices in veterinary medicine, the dairy industry, and food processing.

516. Novel Antibacterial Active Quinolone-Fluoroquinolone Conjugates and 2D-QSAR Studies

Siva S. Panda, Sumaira Liaqat, Adel S. Girgis, Ahmed Samir, C. Dennis Hall and Alan R. Katritzky

Novel, quinolone–fluoroquinolone conjugates 10a–f, 11a–f, 13a–f and 14a–f with amino acid linkers were synthesized in good yields utilizing benzotriazole chemistry. Antibacterial bioassay showed the synthesized bis-conjugates exhibit anti-bacterial properties comparable with the parent drugs
Keywords: Quinolone; Fluoroquinolone; Conjugates; Amino Acids; Anti-Bacterial; QSAR.

517. In-Vitro Assessment of Differential Cytokine Gene Expression in Response to Infections with Egyptian Classic and Variant Strains of Highly Pathogenic H5N1 Avian Influenza Virus

A.A. Samy, M.I. El-Enbaawy, A.A. El-Sanousi, S.A. Abd El-Wanes,A.M. Ammar, H. Hikono and T. Saito

In Egypt, two distinct genetic groups of HPAI H5N1 viruses are co-circulating: classic 2.2.1/C sub-clade and antigenic drift variant 2.2.1.1 clade isolated from vaccinated poultry flocks. The response of chicken innate immunity to both genotypes is not investigated, so far. In this study, expression of immune related genes (IL1b, IL4, IL6, IL8, IL10, IL18, IFNα and IFNβ) after infecting chicken macrophage cell line (HD11) and chicken peripheral blood Mononuclear cells (PBMC) with a classic and a variant strains was assayed using quantitative reverse-transcription real-time polymerase chain reaction assays (qRT-PCR). In HD11, the variant strain induced higher levels of IL1b and IL8 at 6 hours post infection (hpi), IL4 at 24 / 48 hpi and IFNa at 48 hpi than the classic strain. Conversely, the classic strain induced about 10-fold increase of IFNα at 24 and 48 hpi and the virus replicated at higher level than the variant strain. The results of PBMC infection were similar to that reported from HD11 except for IFNβ gene expression that was higher at variant strain infected cells than that infected with the classic strain. After 24hpi skewing the innate immune response toward anti-inflammatory (humoral-associated) cytokines was different between HD11 (through IL4) and PBMC (through IL10). To sum up, the classic strain produced less cytokines which may indicate adaptation to evade the recognition by the innate immune system and explain its higher pathogenicity.
Keywords: Avian Influenza;H5N1; Cytokines; Interferon alpha; Interferon gamma; Interleukin.

518. Prevalence and Antimicrobial Resistance Profile of Staphylococcus Species in Chicken and Beef Raw Meat in Egypt

Kamelia M. Osman, Aziza M. Amer, Jihan M. Badr, and Aalaa S.A. Saad

Coagulase-positive (CPS) and coagulase-negative (CNS) staphylococci cause staphylococcal food poisoning. Recently, CPS and CNS have received increasing attention due to their potential role in the dissemination of antibiotic resistance markers. The present study aimed to evaluate CPS and CNS species distribution and their antibiotic resistance profile isolated from chicken and beef meat. Fifty fresh, uncooked chicken parts and 50 beef meat cuts (local n = 27; imported n = 23) were used. One hundred staphylococcal isolates belonging to 11 species were isolated and identified from chicken (n = 50) and beef (n = 50) raw meat samples. Staphylococcus hyicus (26/100), lugdunensis (18/100), aureus (15/100) and epidermidis (14/100) were dominant. S. aureus was 100% resistant to penicillin and sulfamethoxazole/trimethoprim. Vancomycin-resistant S. aureus showed intermediate resistance (51%), which might indicate the dissemination of vancomycin resistance in the community and imply food safety hazards. The percentage of resistance to b-lactams was variable, with the highest resistance being to penicillin (94%) and lowest to ampicillin-sulbactam (22%). Antimicrobial resistance was mainly against penicillin (94%), clindamycin (90%) and sulfamethoxazole/trimethoprim (82%). The results indicate that chicken and beef raw meat are an important source of antibiotic-resistant CPS and CNS.

519. Leptospirosis in Animals and Human Contacts in Egypt: Broad Range Surveillance

Ahmed Samir, Rafi k Soliman, Mahmoud El-Hariri, Khaled Abdel-Moein and Mahmoud Essam Hatem

Introduction: Leptospirosis is a re-emerging zoonotic disease of humans and animals worldwide. The disease is caused by pathogenic species of the genus Leptospira. These organisms are maintained in nature via chronic renal infection of carrier animals, which excrete the organisms in their urine. Humans become infected through direct or indirect exposure to infected animals and their urine or through contact with contaminated water and soil. This study was conducted to investigate Leptospira infections as a re-emerging zoonosis that has been neglected in Egypt.
Methods: Samples from 1,250 animals (270 rats, 168 dogs, 625 cows, 26 buffaloes, 99 sheep, 14 horses, 26 donkeys and 22 camels), 175 human contacts and 45 water sources were collected from different governorates in Egypt. The samples were collected from different body sites and prepared for culture, PCR and the microscopic agglutination test (MAT).
Results: The isolation rates of Leptospira serovars were 6.9%, 11.3% and 1.1% for rats, dogs and cows, respectively, whereas the PCR results revealed respective detection rates of 24%, 11.3% and 1.1% for rats, dogs and cows. Neither the other examined animal species nor humans yielded positive results via these two

techniques. Only six Leptospira serovars (Icterohaemorrhagiae, Pomona, Canicola, Grippotyphosa, Celledoni and Pyrogenes) could be isolated from rats, dogs and cows. Moreover, the seroprevalence of leptospiral antibodies among the examined humans determined using MAT was 49.7%.
Conclusions: The obtained results revealed that rats, dogs and cows were the most important animal reservoirs for leptospirosis in Egypt, and the high seroprevalence among human contacts highlights the public health implications of this neglected zoonosis.
Keywords: Leptospirosis; Zoonosis; Egypt.

520. Mixed Rearing Correlates with the Existence of Trichophyton Verrucosum Pathogens in Humans

Wael F. El-Tras, Ahmed A. Tayel, Radi A. Mohamed, Doaa M. El-Kordy,Nevein N. El-Kady and Ahmed Samir

Background/Objective: Trichophyton verrucosum is a serious zoophilic dermatophyte causing dermatophytic infections and skin lesions in humans and animals. Raising small ruminants beside cattle is a common practice in rural areas of Egypt. Therefore, the current study emphasizes the risk of T. verrucosum spreading through backyard farming, recognizing the interconnectedness of ruminants and humans.
Methods: A total of 478 cattle, 215 sheep, 186 goats, and 250 human contacts were investigated for the presence of skin lesions, and then the lesions were sampled. All samples were examined by fungal cultures using Sabouraud dextrose agar.
Results: The highest rate of T. verrucosum isolates was recorded in cattle that grew up along with sheep and goats (14.5%), whereas the lowest rate was observed in cattle reared as a single species (6.6%), with a significant difference of p = 0.04, odds ratio = 2.42 at a 95% confidence interval: 1.03-5.65. In addition, there was a borderline significant difference of p = 0.05 between the presence of T. verrucosum pathogens in humans in contact with combined species of cattle, sheep, and goats (13.8%) and those in humans in contact with cattle only (3.3%); the odds ratio was 4.66 at a 95% confidence interval: 1.00-22.53. Moreover, the highest rate of T. verrucosum isolates in cattle was recorded in young cattle (calves). Tinea barbae was found in 11 human cases, while tinea corporis was determined in seven cases.
Conclusion: Rearing different species of small ruminants with cattle supports the spread of T. verrucosum pathogens. Tinea barbae caused by T. verrucosum was predominant in the examined humans.
Keywords: Epidemiology; Humans; Ruminants; Trichophyton Verrucosum; Zoonoses.

521. Molecular Characterization of Escherichia Coli O157: H7 Recovered from Meat and Meat Products Relevant to Human Health in Riyadh, Saudi Arabia

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Raw meat can harbor pathogenic bacteria, potentially harmful to humans such as Escherichia coli O157:H7 causing diarrhea and

hemolytic-uremic syndrome (HS). Therefore, the current study was carried out to evaluate the prevalence and the molecular detection characterization of E. coli serotype O157:H7 recovered from raw meat and meat products collected from Saudi Arabia. During the period of 25th January 2013 to 25th March 2014, 370 meat samples were collected from abattoirs and markets located in Riyadh, Saudi Arabia "200 raw meat samples and 170 meat products". Bacteriological analysis of the meat samples and serotyping of the isolated E. coli revealed the isolation of 11 (2.97%) strains of E. coli O157:H7. Isolation of E. coli O157:H7 in raw beef, chicken and mutton were 2%, 2.5%, and 2.5%, respectively, however, there was no occurrence in raw turkey. The incidences of E. coli O157:H7 in ground beef, beef burgers, beef sausage, ground chicken and chicken burgers were 5%, 10%, 0.0%, 5% and 0.0%, respectively. The multiplex PCR assay revealed that 3 (27.27%) out of 11 E. coli O157:H7 isolates from raw beef, chicken and mutton had stx1, stx2, and eae while 5 (45.45%) E. coli O157:H7 isolates from ground beef, ground chicken, and raw beef had both stx1 and stx2. However, from beef burgers, only one E. coli O157:H7 isolate had stx1 while two were positive for hlyA gene. These results call for urgent attention toward appropriate controls and good hygienic practices in dealing with raw meat.

Keywords: E. Coli O157:H7; Hemolysin; Intimin Gene; Meat; Multiplex PCR; Shiga Toxin.

522. Prevalence of Virulence Genes and Antimicrobial Resistance Patterns of Campylobacter Species Isolated from Chicken In Egypt

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The high incidence of Campylobacter diarrhea represents a significant public health hazard. A total of 400 internal organs of either apparently healthy or diseased chicken were investigated for campylobacteriosis. The incidence of Campylobacter was higher in case of fecal samples, followed by fecal samples then duodenum samples. The highest recovery rates were obtained during summer season followed by the winter and spring, respectively. Campylobacter isolates were confirmed to be C. jejuni or C. coli using MapA and Col 2, 3 primers. The prevalence of virulence (cadF, flaA, ceuE) and CDT toxin (cdtA, cdtB, cdtC) encoding genes in C. jejuni and C. coli isolated from chicken illustrated that, 100, 78.6, 50 and 35.7% of C. jejuni isolates showed amplified fragments of ceuEj, cadF, cdtabc and flaA genes, respectively. Among the C. coli isolates 100% showed amplified fragments of ceuEc, no isolates had cdtabc genes, while 83.3% of C. coli isolates showed amplified fragments for cadF and flaA genes, respectively. Antibiotic resistance and plasmid virulence factors of Campylobacter were also estimated and all C. jejuni and C. coli isolates were totally susceptible to amikacin and tobramycin. Meanwhile high rate of antimicrobial resistance recorded may pose serious danger to the public health.

Keywords: Campylobacter jejuni; Campylobacter Coli; Pcr; Virulence genes; Plasmid; Antibacterial sensitivity.

523. Molecular and Serotyping Characterization of Shiga Toxogenic Escherichia Coli Associated with Food Collected from Saudi Arabia

Onizan G. Al-Zogibi, Moussa I. Mohamed, Ashgan M. Hessain ,Jakeen K. El-Jakee and Saleh A. Kabli

Shiga toxin-producing Escherichia coli (STEC) strains are considered as one of the major food-borne disease agents in humans worldwide. STEC strains, also called verotoxin-producing E. coli strains. The objectives of the present study were serotyping and molecular characterization of shiga toxigenic E. coli associated with raw meat and milk samples collected from Riyadh, Saudi Arabia. A total of 540 milk samples were collected from 5 dairy farms and 150 raw meat samples were collected from different abattoirs located in Riyadh, Saudi Arabia. E. coli were recovered from 86 milk samples (15.93%), serotyping of E. coli isolates revealed, 26 (4.81%) strains O157: H7, 23 (4.26%) strains O111, 20 (3.70%) strains O113: H21, 10 (1.85%) strains O22: H8 and 7 (1.3%) strains O172: H21. Meanwhile, 17 (11.33%) strains of E. coli were recovered from raw meat samples, serotyping of E. coli isolates revealed, 6 (4%) strains O157: H7, 5 (3.33%) strains O111 and 4 (2.67%) strains O174: H2 and only two (1.33%) strains were identified as O22: H8. Shiga toxin2 was detected in 58 (67.44%) serotypes of E. coli recovered from milk samples and 16 (94.12%) serotypes of E. coli recovered from meat samples, while intimin gene was detected in 38 (44.186%) serotypes of E. coli recovered from milk samples and in 10 (58.82%) serotypes of E. coli recovered from meat samples. The results of this study revealed the efficiency of combination between serotyping and molecular typing of E. coli isolates recovered from food of animal origin for rapid detection and characterization of STEC.

Keywords: E. Coli; Foodborne; Intimin gene; Milk samples; Raw Meat; Shiga;Toxin genes.

524. Occurrence of Canine Borreliosis in Egyptian Dogs: A Public Health Threat

Ahmed Samir, Ahmed Fahmy, Essam Hatem M and Ahmed Orabi

Background: Lyme borreliosis is a worldwide zoonosis caused by the spirochete Borrelia burgdorferi, which is transmitted by a tick bite, primarily from Ixodes scapularis and Ixodes pacificus. In Egypt, few articles reported the existence of Lyme disease in humans and animals. The aim of the current study is to investigate the presence of B. burgdorferi in dogs, ticks and contact human cases in Egypt.

Methods and findings: A total of 100 samples of dogs (70), contact human (15) and ticks (15) were collected and subjected for culture, PCR and/or IgM ELISA. 50/70 (71.4%) of canine sera were sero-reactive, while 3/15 (20%) in human cases were reactive. OspA gene was detected in the blood of 13 out of 70 dogs (18.5%). 6/15 (4%) ticks (Rhipicephalus sanguineus) that collected from dogs contained the ospA gene, while none of human blood samples was positive by PCR. None of the investigated samples give positive results for B. burgdorferi by culture.

Conclusions: This study confirms the occurrence of B. burgdorferi infection in Egyptian dogs in which the only identified tick species is Rhipicephalus sanguineus.
Keywords: Lyme Borreliosis; Dogs; Egypt.

Dept. of Obstetrics, Reproduction and Artificial Insemination

525. Suppressive Effects of Long-Term Exposure to P-Nitrophenol on Gonadal Development, Hormonal Profile with Disruption of Tissue Integrity, and Activation of Caspase-3 in Male Japanese Quail (Coturnix Japonica)

Eman Ahmed, Kentaro Nagaoka, Mostafa Fayez, Mohamed M. Abdel-Daim, Haney Samir and Gen Watanabe

P-Nitrophenol (PNP) is considered to be one of nitrophenol derivatives of diesel exhaust particles. PNP is a major metabolite of some organophosphorus compounds. PNP is a persistent organic pollutant as well as one of endocrine-disrupting compounds. Consequently, bioaccumulation of PNP potentiates toxicity. The objectives of the current study were to assess in vivo adverse effects of long-term low doses of PNP exposure on reproductive system during development stage. Twenty-eight-day-old male Japanese quails were orally administered different doses of PNP (0, 0.01, 0.1, 1 mg/kg body weight) daily for 2.5 months. Testicular histopathology, hormones, caspase-3 (CASP3), and claudin-1 (CLDN1) tight junction protein, as well as plasma hormones were analyzed. The results revealed that long-term PNP exposure caused testicular histopathological changes such as vacuolation of spermatogenic cell and spermatocyte with significant testicular and cloacal gland atrophy. PNP activated CASP3 enzyme that is an apoptosis-related cysteine peptidase. Besides, it disrupted the expression of CLDN1. Furthermore, a substantial decrease in plasma concentrations of luteinizing hormone (LH) and testosterone was observed after 2 and 2.5 months in the PNP-treated groups.Meanwhile, the pituitary LH did not significantly change. Site of action of PNP may be peripheral on testicular development and/or centrally on the hypothalamic–pituitary–gonadal axis through reduction of pulsatile secretion of gonadotrophin-releasing hormone. Consequently, it may reduce the sensitivity of the anterior pituitary gland to secrete LH. In conclusion, PNP induced profound endocrine disruption in the form of hormonal imbalance, induction of CASP3, and disruption of CLDN1 expression in the testis. Hence, it may hinder the reproductive processes.
Keywords: Caspase-3; Claudin-1; Diesel exhausts particles.

526. Expression of TGFβ Superfamily Components and Other Markersofoocytequality Inoocytesselected bybrilliantcresyl Blue Staining: Relevance to Early Embryonic Development

Mohamed Ashry, Kyungbon Lee, Mohan Mondal,Tirtha Datta, Joseph K. Folger, Sandeep K. Rajput, Kun Zhang, Nabil A. Hemeida and George W. Smith

Brilliant cresyl blue (BCB) is a super-vital stain that has been used to select competent oocytes in different species. One objective of the present study was to assess the relationship between BCB staining, which correlates with an oocyte's developmental potential, and the transcript abundance for select TGFb-superfamily components, SMAD2/3 and SMAD1/5 phosphorylation levels, and oocyte (JY1) and cumulus-cell(CTSB,CTSK,CTSS, andCTSZ) transcript markers in bovine oocytes and/or adjacent cumulus cells. The capacity of exogenous follistatin or JY1 supplementation or cathepsin inhibitor treatment to enhance development of embryos derived from low-quality oocytes, based on BCB staining, was also determined. Cumulus-oocyte complexes (COCs) from abattoir-derived ovaries were subjected to BCB staining, and germinal-vesicle-stage oocytes and cumulus cells were harvested from control,BCC+, and BCB- (low-quality oocyte) groups for real-time PCR or Western-blot analysis. Remaining COCs underwent in vitro maturation, in vitro fertilization, and embryo culture in the presence or absence of the above exogenous supplements. Levels of FST, JY1, BMP15, and SMAD1, 2, 3, and 5 transcripts were higher in BCB+ oocytes whereas CTSB, CTSK, CTSS, and CTSZ mRNA abundance was higher in cumulus cells surrounding BCB- oocytes. Western-blot analysis revealed higher SMAD1/5 and SMAD2/3 phosphorylation in BCB+ than BCB- oocytes. Embryoculture studies demonstrated that follistatin and cathepsin inhibitor treatment, but not JY-1 treatment, improve the developmental competence of BCB- oocytes. These results contribute toabetter understanding of molecular indices of oocyte competence.
Keywords: Bovine; Oocyte quality; Follistatin; TGFβ.

527. Morphologic Characterization of Isolated Bovine Early Preantral Follicles During Short-term Individual in Vitro Culture

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To provide new insights in the molecular mechanism controlling preantral follicular development and to unravel the needs to support in vitro follicular development of early-stage preantral follicles (PAFs), there is a need for alternative in vitro bovine follicle culture methods. In this study, we aimed to characterize follicular dynamics using an IVC system of isolated and individually cultured bovine early PAFs during 10 days to generate individual follicle follow-up data. Preantral follicles (<50 µm) were isolated from slaughterhouse ovaries and cultured individually for 10 days. Individual follicle morphology, growth, survival, quality, and cell proliferation were evaluated in time by combining noninvasive and invasive assessment methods. The PAFs were light microscopically evaluated during culture to assess follicular dynamics, stained with neutral red to determine follicle viability, stained with 4',6-diamidino-2-phenylindole and terminal deoxynucleotidyl transferase dUTP nick end labeling to evaluate cell proliferation and follicle quality, and processed for histologic evaluation to assess follicle morphology. On the basis of their morphology, follicles were subdivided in three categories, with category 1 follicles showing the best morphologic features. On Day 0, only category 1 follicles were selected, but follicle categories were reassigned on evaluation Days 1, 2, 4, 7, or 10. Although 67% of the follicles survived 10 days of IVC, the number of follicles exhibiting a normal morphology decreased

significantly from Day 7 onward and the apoptotic index increased significantly from Day 10. Both category 1 and 2 follicles showed a significant increase in follicular diameter (Day 10: 21.80 ± 0.86 and 11.82 ± 0.80, respectively). This increase in follicular diameter showed to be correlated with an increase in the total cell number. In conclusion, this culture system showed to support follicular development until Day 10, although the proportion of follicles showing normal morphologic features and the follicular quality decreased after 10 days of IVC. Follicles maintaining their category 1 morphologic features over time seem to be of a better quality and show a higher developmental competence as compared to category 2 and 3 follicles.
Keywords: Individual; Preantral follicle; IVC; Bovine.

528. Sexual Behavior and Hormonal Profiles in Arab Stallions

Magdi M. Waheed, Ibrahim M. Ghoneim and Muhammad S. Abdou

One hundred ninety ejaculates were collected from 16 healthy Arab stallions (5–18 years; 12 normal and four slow breeders) over 12 months, and sexual behavior parameters were recorded. Serum samples were collected from stallions for determination of testosterone, estradiol-17β, cortisol, and glucose. The results revealed that the time to first mount, latency to erection, latency to mount, and number of mounts per ejaculate were significantly (P < .001) shorter in normal breeders (61.12 ± 5.18, 49.45 ± 3.78, 82.54 ± 6.39, and 1.32 ± 0.04, respectively; n = 12) than in slow breeder stallions (259.82 ± 42.66, 228.26 ± 50.48, 371.95 ± 36.27, and 2.63 ± 0.35, respectively; n = 4). Sexual behavior abnormalities constituted 10.42% of all trials. Season exerted a significant (P < .05) effect on all sexual behavior parameters except latency to ejaculation, which was the shortest during spring in the normal breeders. Sexual behavior abnormalities were significantly (P < .05; 37%) higher in all stallions during autumn. Both serum estradiol-17β and cortisol levels rose significantly (P < .05) after semen collection in all stallions. Serum estradiol-17β level was significantly (P < .05) increased during spring and summer in all stallions. Cortisol levels were significantly (P < .05) higher during autumn in both normal and slow breeder stallions ($2,121.15 \pm 115.55$ and 69.37 ± 21.84 pg/mL, respectively). In conclusion, sexual behavior parameters in normal breeders were shorter in duration than that recorded in slow breeder stallions. Season affects sexual behavior parameters and serum estradiol-17β levels, with the highest values found during spring and summer. Estradiol-17β and cortisol were the two hormones responsible for sexual behavior in stallions. The best sexual behavior was accompanied by low levels of serum testosterone.
Keywords: Arabian horse; Sexual behavior; Testosterone; Estradiol-17 β;Cortisol.

529. Morphometric Characteristics of Spermatozoa in the Arabian Horse with Regard to Season, Age, Sperm Concentration and Fertility

Magdi M. Waheed, Ibrahim M. Ghoneim and Muhammad S.S. Abdou

One hundred eighty ejaculates were collected from 15 healthy Arabian horses (6–26 years old) for morphometric evaluation of their spermatozoal dimensions. The progressively motile sperm percentage, sperm abnormalities percentage, and sperm cell concentration ($\times 10^6$ sperm/mL) were determined. Stained slides with nigrosin–eosin solution were prepared for sperm morphometric analysis using an eye-piece micrometer. The sperm measurements were sperm head length, head maximum breadth, head base breadth, acrosome length, midpiece and breadth, tail length and breadth, sperm head area, and perimeter. Data were divided according to season, stallions' age, and fertility. Results revealed that mensuration of sperm head length, head maximum breadth, midpiece length, and tail length were 5.96 ± 0.004, 3.06 ± 0.004, 10.17 ± 0.008, and 48.88 ± 0.022 µm, respectively. The head area and perimeter were 14.33 ± 0.022 µm2 and 14.16 ± 0.009 µm, respectively. The total number of sperm per ejaculate in spring and summer was significantly (P< .05) higher than in autumn and winter. The lowest sperm concentration ($153.61 \pm 26.75 \times 10^6$/mL) and the longest head length (6.00 ± 0.01 µm) were found during winter. Sperm head length, head maximum breadth, head base breadth, head area, and perimeter were the lowest in group A (<10 years). Sperm morphometry was highly significantly (P< .001) affected by the stallion. The head maximum breadth, head base breadth, sperm head area, and perimeter were (P< .001) smaller in stallions with high fertility (69%–79%) compared with those of low fertility (50%–59%). In conclusion, stallion sperm morphometry was affected by the season, stallions' age, and stallions. Sperm head maximum breadth, head area, and perimeter were smaller in stallions of high fertilizing capacity.
Keywords: Arabian horse; Sperm morphometry; Sperm concentration; Fertility.

530. Effect of A Single Injection of Gonadotropin-Releasing Hormone (GnRH) and Human chorionic gonadotropin (hCG) on testicular blood flow measured by color doppler ultrasonography in male Shiba goats

Haney Samir, Kazuaki Sasaki, Eman Ahmed, Aly Karen, Kentaro Nagaoka, Mohamed El Sayed,Kazuyoshi Taya and Gen Watanabe

Although color Doppler ultrasonography has been used to evaluate testicular blood flow in many species, very little has been done in goat. Eight male Shiba goats were exposed to a single intramuscular injection of either gonadotropin-releasing hormone (GnRH group; 1 µg/kg BW) or human chorionic gonadotropin (hCG group; 25 IU/kg BW). Plasma testosterone (T), estradiol (E2) and inhibin (INH) were measured just before (0 hr) and at different intervals post injection by radioimmunoassay. Testis volume (TV) and Doppler indices, such as resistive index (RI) and pulsatility index (PI) of the supratesticular artery, were measured by B-mode and color Doppler ultrasonography, respectively. The results indicated an increase in testicular blood flow in both groups, as RI and PI decreased significantly (P<0.05), but this increase was significant higher and earlier in hCG group (1 hr) than in the GnRH group (2 hr). A high correlation was found for RI and PI with both T (RI, r= -0.862; PI, r= -0.707) and INH in the GnRH group (RI,

r=0.661; PI, r=0.701). However, a significant (P<0.05) correlation was found between E2 and both RI (r= -0.610) and PI (r= -0.763) in hCG group. In addition, TV significantly increased and was highly correlated with RI in both groups (GnRH, r= -0.718; hCG, r= -0.779). In conclusion, hCG and GnRH may improve testicular blood flow and TV in Shiba goats.

Keywords: Blood supply; Goat; Testis.

531. Application of Embryo Transfer Using in Vitro Produced Embryos: Intrinsic Factors Affecting Efficiency

Ashry, M. and Smith G.W.

Embryo transfer remains a viable approach to increase propagation of offspring from high genetic merit females. Although it is now over 60 years since the report of the birth of the first calf from embryo transfer, utilisation of embryo transfer technology worldwide is not widespread. Limitations of conventional procedures for superovulation and embryo transfer are not limited to but include variability in response to superovulation, the labour intensive nature of superovulation procedures, time required between collections and cost of technology. Recently, harvest of ova and transfer of in vitro produced embryos has received more attention as a potential alternative to conventional superovulation and subsequent embryo transfer. Aspiration of follicular ova and in vitro embryo production offers potential advantages in reducing loss of female germplasm occurring through the natural process of ovarian follicular atresia, can increase yield of embryos from elite donor cows beyond that possible with superovulation, and provides a means of salvaging genetic material from valuable animals at slaughter or those culled for disease control or other reasons. Recent evidence indicates poor ovum quality is a major factor limiting in vitro embryo production and discovery of a role for intrinsic factors such as ovum follistatin and cumulus cell cathepsins in control of ovum quality has led to ongoing research on new technologies to increase yield of transferable embryos.

Keywords: Bovine;Ivf; Embryo transfer; Oocyte quality.

Dept. of Parasitology

532. Monthly Variations of Rhinoestrus Spp. (Diptera: Oestridae) Larvae Infesting Donkeys in Egypt: Morphological and Molecular Identification of Third Stage Larvae

Mosaad A. Hilali, Olfat A. Mahdy and Marwa M. Attia

This study was carried out to investigate the prevalence and monthly intensity of Rhinoestrus (R) spp. among donkeys slaughtered at Giza Zoo abattoir, Egypt. A total of 144 donkeys were examined at postmortem through two visits per month from January 2010 to December 2010. All donkeys were infested with one or more larval stages during all months of the examination period (100%). The 1st and 2nd stage larvae (L1 and L2) were mostly observed in the turbinate bones and seldom in the nasal passages, whereas the 3rd stage larvae (L3) were observed mostly in ethmoid and lamina cribrosa and rarely in nasal passages and pharynx. The highest monthly intensity of infestation with the total number of larval stages was recorded in January and August, while the lowest occurred in September. L1 was observed during all months with two peaks in January and June. L2 occurred from February to April, July, and August. L3 was present from March to May, August, and September. The ranked size of infestation with the total number of the 3 larval stages of Rhinoestrus spp. showed that a total of 107 donkeys had 1–10 larvae; 34 had 11–30 larvae; and 3 harbored 31–50 larvae. The morphology and molecular characterization of the third stage larvae of Rhinoestrus spp. were investigated. Morphologically, two morphotypes (1 and 2) of Rhinoestrus spp. (R. usbekistanicus like and the other R. purpureus like) were reported. Whereas molecular sequencing of mitochondrial cytochrome-oxidase subunit I showed 99% homology with those of R. usbekistanicus. In conclusion, Rhinoestrus spp. present in Egypt is mainly R. usbekistanicus, which includes two morphotypes, R. usbekistanicus like and R. purpureus like.

Keywords: Donkeys; Rhinoestrus spp; Larvae; Molecular and Morphological; Identification;Egypt.

533. A Review of Sarcocystosis in Camels and Redescription of Sarcocystis Cameli and Sarcocystis Ippeni Sarcocysts from the One-Humped Camel (Camelus Dromedarius)

J. P. Dubey, M. Hilali, E. Van Wilpe, R. Calero-Bernal, S.K. Verma and i. E. Abbas

There is considerable confusion concerning Sarcocystis species in camels. Five species: Sarcocystis cameli, Sarcocystis ippeni, Sarcocystis camelicanis, Sarcocystis camelocanis and Sarcocystis miescheri were named with inadequate descriptions and no type specimens. Here, we review literature on sarcocystosis in camels worldwide and redescribe structure of S. cameli and S. ippeni sarcocysts by light- and transmission electron microscopy (LM and TEM). Eight sarcocysts from the oesophagi of two camels (Camelus dromedarius) from Egypt were studied. By LM, all sarcocysts were thinwalled with barely visible projections on the cyst walls. By TEM, two structurally distinct sarcocysts were recognized by unique villar protrusions (vp) not found in sarcocysts from any other host. Sarcocysts of S. cameli had vp of type 9j. The sarcocyst wall had upright slender vp, up to $3 \cdot 0$ μM long and $0 \cdot 5$ μM wide; the total thickness of the sarcocyst wall with ground substance (gs) layer was $3 \cdot 5$ μM. On each vp, there were rows of knob-like protrusions that appeared to be interconnected. The vp had microtubules that originated at midpoint of the gs and continued up to the tip; microtubules were smooth, without any granules or dense areas. Bradyzoites were approximately $14–15 \times 3–4$ μM in size with typical organelles. Sarcocystis ippeni sarcocysts had type 32 sarcocyst wall characterized by conical vp with an electron dense knob. The total thickness of the sarcocyst wall (from the base of gs to vp tip) was $2 \cdot 3–3 \cdot 0$ μM. The vp were up to $1 \cdot 2$ μM wide at the base and $0 \cdot 25$ μM at the tip. Microtubules in vp originated at midpoint of gs and continued up to tip; microtubules were criss-crossed, smooth and without granules or dense areas. Bradyzoites were $12 \cdot 0–13 \cdot 5 \times 2 \cdot 0–3 \cdot 0$ μM in size. Sarcocystis camelicanis, S. camelocanis and S. miescheri are considered invalid.

Keywords: Sarcocystis cameli; Sarcocystis ippeni; One-Humped camel (Camelus Dromedarius); Electron microscopy.

534. Molecular Characterisation of Three Regions of the Nuclear Ribosomal DNA Unit and the Mitochondrial cox1 Gene of Sarcocystis Fusiformis from Water Buffaloes (Bubalus Bubalis) in Egypt.

Bjørn Gjerde , Mosaad Hilali andSahar Abdel Mawgood

A total of 33 macroscopically visible (3-11 × 1-5 mm) sarcocysts of Sarcocystis fusiformis were excised from the oesophagus of 12 freshly slaughtered water buffalos in Giza, Egypt. Genomic DNA was extracted from the sarcocysts, and all isolates were characterised at the mitochondrial cytochrome c oxidase subunit I (cox1) gene through PCR amplification and direct sequencing, whereas a few selected isolates were characterised at the 18S and 28S ribosomal (r) RNA genes and the internal transcribed spacer 1 (ITS1) region of the nuclear rDNA unit following cloning. Among the 33 cox1 sequences (1,038-bp long), there was a total of 13 haplotypes, differing from each other by one to seven substitutions and sharing an identity of 99.3-99.9 %. In comparison, the sequence identity was 98.8-99.0 % among eight complete 18S rRNA gene sequences (1,873-1,879-bp long), 98.1-100 % among 28 complete ITS1 sequences (853-864-bp long) and 97.4-99.6 % among five partial 28S rRNA gene sequences (1,607-1,622 bp). At the three nuclear loci, the intraspecific (and intra-isolate) sequence variation was due to both substitutions and indels, which necessitated cloning of the PCR products before sequencing. Some additional clones of the 18S and 28S rRNA genes were highly divergent from the more typical clones, but the true nature of these aberrant clones could not be determined. Sequence comparisons and phylogenetic analyses based on either 18S rRNA gene or cox1 nucleotide sequences, placed S. fusiformis closest to Sarcocystis cafferi from the African buffalo, but only the analyses based on cox1 data separated the two taxa clearly from each other and showed that they were separate species (monophyletic clusters and 93 % sequence identity at cox1 versus interleaved sequences and 98.7-99.1 % sequence identity at the 18S rRNA gene). Two cats experimentally infected with sarcocysts of S. fusiformis started shedding small numbers of sporocysts 8-10 days post-infection (dpi) and were euthanized 15 dpi. Sporocysts isolated from the intestinal mucosa of both cats were identified molecularly as belonging to S. fusiformis through PCR amplification and sequencing of the partial cox1. The two sporocyst-derived cox1 sequences were identical with the most common sarcocyst-derived cox1 haplotype.

Keywords: Sarcocystis fusiformis; Water buffaloes; Bubalus bubalis; Cats-Egypt; Phylogeny; 18S rRNA; 28S rRNA; ITS1-Cox1; Sarcocystis cafferi.

Dept. of Pathology

535. The Remedial Efficacy of Spirulina Platensis Versus Chromium-Induced Nephrotoxicity in Male Sprague-Dawley Rats

M. O. Elshazly, Sahar S. Abd El-Rahman, Ashraf M. Morgan and Merhan E. Ali

This study was conducted to investigate the possible protective effect of Spirulina platensis against chromium-induced nephrotoxicity. A total of 36 adult male Sprague-Dawley rats were divided into 4 equal groups (Gps). Gp1 served as control, rats of Gps 2, 3, and 4 were exposed to Spirulina platensis (300 mg/kg b.wt per os) and sodium dichromate dihydrate (SDD) via drinking water at concentration of 520 mg /l respectively. Chromium administration caused alterations in the renal function markers as evidenced by significant increase of blood urea and creatinine levels accompanied with significant increase in kidney's chromium residues and MDA level as well as decreased catalase activity and glutathion content in kidney tissue. Histologically, Cr provoked deleterious changes including: vascular congestion, wide spread tubular epithelium necrobiotic changes, atrophy of glomerular tuft and proliferative hyperplasia. The latter was accompanied with positive PCNA expression in kidney tissues as well as DNA ploidy interpretation of major cellular population of degenerated cells, appearance of tetraploid cells, high proliferation index and high DNA index. Morphometrical measurements revealed marked glomerular and tubular lumen alterations. On contrary, spirulina co-treatment with Cr significantly restored the histopathological changes, antioxidants and renal function markers and all the previously mentioned changes as well.

Keywords: Chromium toxicity; Renal pathology; Antioxidants; Renal morphometry.

536. Inhibition of cadmium-induced genotoxicity and histopathological changes in Niletilapia fish by Egyptian and Tunisian montmorillonite clay

Karima F.Mahrous, AzizaM.Hassan, HasnaaA.Radwan and M.A.Mahmoud

Cadmium (Cd) is an important inorganic toxicant widely distributed in the environment because of its various in dustrialuses. Theaims of the current study were to investing ate theefficacy ofpurified Egyptian and Tunisian montmorillonite clays (EMC and TMC) to in hibitgenotoxicity and histologicalalterations induced by cadmiumchloride (CdCl$_2$) utilizingthe Niletilapia fish asaninvivomodel.Chromosomal aberrations (CAs) , micronucleus (MN) frequenciesand DNA fingerprinting profile were genotoxicend points and histopathological changes that were used in this investigation. Sixgroupsof fish weretreated for 2 weeks and included control group, CdCl2 –treated group and group streated with EM Cor TM Calone or incombination with Cd Cl2. The presen tresultsrevealed that , treatmentof fish with Cd Cl2 exhibited significant in creasedin the number of micronucleatederythrocytes (MnRBCs) , frequency of CA sandinstability of genomic DNA. Treatment of EMC and TMC in combinati on with Cd Cl2 signifi cantly reduced the frequency of MnRBCs by the percent age of 53.28% and 60.77% and the frequency of CAs by 43.91%and 52.17% respectively. Aswell as , normalized DNA fin gerprinting profile and significantly improved is to pathological pictureinduced by Cadmium treatment. It is worthmention that bothclays have the abilitytotightly bind Cd Cl$_2$ and decreased its cytotoxicity and genotoxicity; however,Tunisian claywasmoreefficient inbindingwith the CdC l$_2$ than Egyptian clay.

Keywords: Fish ; Cadmium; Clays; RAPD ; PCR; Cytogenetics Histopathology.

537. Hepatocyte Growth Factor Mediates the Antifibrogenic Action of Ocimum Bacilicum Essential Oil Against CCL4-Induced Liver Fibrosis in Rats

Hanan A. Ogaly, Nadia A. Eltablawy, Adel M. El-Behairy, Hatim El-Hindi and Reham M. Abd-Elsalam

The current investigation aimed to evaluate the antifibrogenic potential of Ocimum basilicum essential oil (OBE) and further to explore some of its underlying mechanisms. Three groups of rats were used: group I (control), group II (CCl4 model) and group III (OBE-treated) received CCl4 and OBE 2 weeks after the start of CCl4 administration. Oxidative damage was assessed by the measurement of MDA, NO, SOD, CAT, GSH and total antioxidant capacity (TAC). Liver fibrosis was assessed histopathologically by Masson's trichrome staining and a-smooth muscle actin (a-SMA) immunostaining. Expression of hepatocyte growth factor (HGF) and cytochrome P450 (CYP2EI isoform) was estimated using real-time PCR and immunohistochemistry. OBE successfully attenuated liver injury, as shown by histopathology, decreased serum transaminases and improved oxidative status of the liver. Reduced collagen deposition and a-SMA immuopositive cells indicated an abrogation of hepatic stellate cell activation by OBE. Furthermore, OBE was highly effective in stimulating HGF mRNA and protein expression and inhibiting CCl4-induced CYP2E1 down-regulation. The mechanism of antifibrogenic action of OBE is hypothesized to proceed via scavenging free radicals and activating liver regeneration by induction of HGF. These data suggest the use of OBE as a complementary treatment in liver fibrosis.
Keywords: Ocimum basilicum; Liver fibrosis; Antioxidant; α-Sma; CYP2E1; HGF.

538. Prevalence of Bacterial Infections Among Cage-Cultured Marine Fishes at the Eastern Province of Saudi Arabia.

Mohamed A Hassan, WS Soliman, Mahmoud A Mahmoud, Sami Shabeeb Al-Shabeeb and Peer Mohamed Imran

A total number of 480 fishes of different species namely Twobar Seabream (Acanthopagrus bifasciatus), Sobity Seabream (Sparidentex hasta), Red Sea Seabream (Diplodus noct), Brown-spotted Grouper (Epinephelus coioides), Rabbit Fish (Siganus canaliculatus), Gilthead Seabream (Sparus aurata), were randomly collected from two private marine fish farms located at Arabian Gulf, Eastern Province, Saudi Arabia during a period of October 2013 until September 2014. The prevalence of bacterial infections in different seasons of the year and species susceptibility for antibiotics were detected. Bacteriological examination revealed the overall infection with different types of bacteria was 39.16% and they were related to Gram-negative bacteria. A. hydrophila were the most prevalent isolated bacteria represented by 41.48 % followed by Ph. damselae (20.21%) and V. vulnificus (19.68%). Water analysis revealed that, the severe clinical signs of infected fish appeared on fishes reared in cages showed high level of free ammonia and low dissolved water oxygen concentration. The most prominent clinical signs of diseased fish was external haemorrhages, ulcerations, corneal opacity and partial exophthalmia accompanied with peri- orpital haemorrhage. Fish mortalities have been observed in some cages of Sparidentex hasta infected with Ph. damselae or V. vulnificus in summer months only. The degree of susceptibility of the most prevalent isolates causing mortality (Ph. damselae, and V. vulnificus) towards 8 different types of antibiotics were recorded. Gross and histopathological lesions of infected fishes with Photobacterium were carried out.
Keywords: Marine fishes; Arabian gulf; Saudi arabia; Bacterial infections; Seasonal variation; Antibiotic sensitivity test; Histopathology.

Dept. of Pharmacology

539. Dynamic Behaviour and Residual Pattern of Thiamethoxam and its Metabolite Clothianidin in Swiss Chard Using Liquid Chromatography–Tandem Mass Spectrometry

Musfiqur Rahman, Waziha Farha, A.M. Abd El-Aty Humayun Kabir, So Jeong Im,Da-I Jung, Jeong-Heui Choi, Sung-Woo Kim, Young Wook Son, Chan-Hyeok Kwon and Ho-Chul Shin and Jae-Han Shim

A simultaneous method was developed to analyse thiamethoxam and its metabolite clothianidin in Swiss chard using tandem mass spectrometry (in the positive electrospray ionisation mode using multiple reaction monitoring mode) to estimate the dissipation pattern and the pre-harvest residue limit (PHRL). Thiamethoxam (10%, WG) was sprayed on Swiss chard grown in two different areas under greenhouse conditions at the recommended dose rate of 10 g/20 L water. Samples were collected randomly up to 14 days post-application, extracted using quick, easy, cheap, effective, rugged, safe (QuEChERS) acetate-buffered method and purified via a dispersive solid phase extraction (d-SPE) procedure. Matrix matched calibration showed good linearity with determination coefficients (R^2) $\geq$ 0.998. The limits of detection (LOD) and quantification (LOQ) were 0.007 and 0.02 mg/kg. The method was validated in triplicate at two different spiked concentration levels. Good recoveries (n = 3) of 87.48–105.61% with relative standard deviations (RSDs) < 10 were obtained for both analytes. The rate of disappearance of total thiamethoxam residues in/on Swiss chard was best described by first-order kinetics with half-lives of 6.3 and 4.2 days. We predicted from the PHRL curves that if the residues were <19.21 or 26.98 mg/kg at 10 days before harvest, then total thiamethoxam concentrations would be below the maximum residue limits during harvest.
Keywords: Thiamethoxam; Metabolite; Clothianidin; Swiss Chard; LC;MS;MS; Dissipation; Half-Life.

540. Analysis of Benzobicyclon and its Metabolite in Brown Rice and Rice Straw After Field Application Using Liquid Chromatography–Tandem Mass Spectrometry

So Jeong Im, A.M. Abd El-Aty, Young-Jun Lee, Musfiqur Rahman, Sung-Woo Kim,Jeong-Heui Choi and Jae-Han Shim

International Publications Awards, CairoUniversity (IPACU)

This study was carried out to develop an extraction as well as an analytical method for detecting benzobicyclon and its amino-substituted metabolite (1315P-570) in brown rice and rice straw using liquid chromatography – tandem mass spectrometry (LC/MS/MS) in positive ion mode with multiple reaction monitoring (MRM). The parent as well as the metabolite in rice and rice straw were extracted and analysed under the same conditions. A correlation coefficient (R^2) of >0.994 was obtained for matrix-matched calibration curves constructed in various concentration ranges. Recoveries at two fortification levels were satisfactory and ranged between 75.4% and 118.9% with relative standard deviations (RSDs) < 13%. Under storage conditions (-20 °C), the analyte and its metabolite were stable for up to 92 days. The limits of quantitation (LOQ) were lower than the maximum residue limit (MRL) (0.1 mg/kg) set by the Korea Food and Drug Administration for brown rice. Field trials with recommended or double the recommended dose revealed that the herbicide could safely be applied to rice and rice straw, as no residues were detected in the harvested samples. The sensitivity of the developed method was sufficient to ensure reliable determination of benzobicyclon and its metabolite in rice grain and rice straw.

Keywords: Residue; Herbicide; Metabolite; Unpolished rice; Rice Straw; Analysis.

541. Consequences of the Matrix Effect on Recovery of Dinotefuran and its Metabolites in Green Tea During Tandem Mass Spectrometry Analysis

Musfiqur Rahman, A.M. Abd El-Aty, Jeong-Heui Choi, Sung-Woo Kim, Sung Chul Shin and Jae-Han Shim

Food Chemistry, 168: 445-453 (2015) IF: 3.391

Determining the residues of dinotefuran and its metabolites (MNG, UF, and DN) is highly problematic because of their polar characteristics. Additionally, tea contains many compounds that can interfere with residue analysis. Thus, the aim of the present study was to refine the extraction method that assures good recoveries for dinotefuran and its metabolites and removes most of the matrix components in green tea using liquid chromatography–tandem mass spectrometry (LC/MS/MS). We attempted to increase the extraction efficiency of the QuEChERS method by selecting the appropriate solvents among ethyl acetate, acetone, isopropanol, 25% methanol in acetonitrile, and methanol. We found that methanol was the best extraction solvent for dinotefuran and its polar metabolites in dry green tea samples; however, due to a limitation of an appropriate partitioning salt, acetonitrile was used as the extraction solvent. Matrix enhancement and suppression effects were observed for all analytes, which made the recovery rates variable. DN recovery was <70% when compared with matrix-matched calibration, whereas it was within the acceptable range (70–120%) when compared with solvent calibration. The opposite was observed for MNG and dinotefuran due to a matrix suppression effect. UF recovery was consistent in both matrix-matched and solvent calibrations despite having little suppressive effect. The method was successfully applied and dinotefuran and its metabolite residues were found in field-incurred green tea samples. The current findings suggest that using methanol as an appropriate QuEChERS solvent for problematic polar pesticides and investigating a suitable partitioning salt would considerably strengthen the practical impact of such data.

Keywords: Dinotefuran; Metabolites; Matrix effect; Recovery variation.

542. The Effects of Different Night-Time Temperatures and Cultivation Durations on the Polyphenolic Contents of Lettuce: Application of Principal Component Analysis

Sung Woo Jeong, Gon-Sup Kim, Won Sup Lee, Yun-Hi Kim,Nam Jun Kang, Jong Sung Jin, Gye Min Lee, Soo Taek Kim,A.M. Abd El-Aty, Jae-Han Shim and Sung Chul Shin

Journal of Advanced Research, 6: 493-499 (2015) IF: 3

The present study was conducted to characterize the polyphenolic contents of lettuce leaves grown under different night-time temperatures (4, 12, and 20 °C) and cultivation durations (5, 15, and 20 days) using high performance liquid chromatography-tandem mass spectrometry (LC/MS/MS).
The assay method was validated based on specificity, linearity, accuracy, precision, and the performance limit. The total polyphenolic contents were highest (2462.6 mg/kg) after transplantation at a night temperature of 20 °C on day 20 and lowest (1132.7 mg/kg) at the same temperature on day 5. Quantification and principal component analysis showed that the relative contents of quercetin and kaempferol were markedly higher during the early stage of cultivation (day 5) than those of day 15 and 20, and that night-time temperatures of 12 and 20 °C on day 20 were favorable for producing polyphenol-rich lettuce containing caffeic acid. In conclusion, a synergistic effect between high night-time temperatures (12 and 20 °C) and cultivation duration (20 days) produced lettuce rich in polyphenols compared to that at low temperature (4°C).

Keywords: Lactuca sativa L.; Night growth temperature; Principal component analysis; Polyphenols; Compositions.

543. Residue Analysis of Orthosulfamuron Herbicide in Fatty Rice Using Liquid Chromatography–Tandem Mass Spectrometry

Young-Jun Lee, Jeong-Heui Choi, A.M. Abd El-Aty, So Jeong Im, Musfiqur Rahman, Sung-Woo Kim and Jae-Han Shim

Journal of Advanced Research, 6: 511-516 (2015) IF: 3

In the present study, orthosulfamuron residues were extracted from fatty (unpolished) rice and rice straw using a modified QuEChERS method and analyzed using liquid chromatography–tandem mass spectrometry. The matrix-matched calibration was linear over the concentration ranges of 0.01–2.0 mg/kg with determination coefficient (R^2) ≥ 0.997.
The recovery rates at two fortification levels (0.1 and 0.5 mg/kg) were satisfactory and ranged between 88.1% and 100.6%, with relative standard deviation (RSD) <8%.
The limit of quantitation, 0.03 mg/kg, was lower than the maximum residue limit, 0.05 mg/kg, set by the Ministry of Food and Drug Safety in the Republic of Korea. The developed method was applied successfully to field samples harvested at 116 days and none of the samples were positive for the residue.

Keywords: Herbicide; Orthosulfamuron; Fatty rice; Rice straw; QuEChERS; LC/MS/MS.

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544. The Effect of Household Processing on the Decline Pattern of Dimethomorph in Pepper Fruits and Leaves

Sung-Woo Kim, A.M. Abd El-Aty, Musfiqur Rahman, Jeong-Heui Choi,Young-Jun Lee, Ah-Young Ko, Ok-Ja Choi, Hee Nam Jung, Ahmet Hacımüftüo glu e and Jae-Han Shim

The effects of various household processes, including washing, boiling, frying, parboiling, and drying under different conditions (water amount, boiling times, and temperatures) on the residual levels of dimethomorph were evaluated in pepper fruits and leaves grown under plastic greenhouse conditions. The original quick, easy, cheap, effective, rugged, safe (QuEChERS) method (after modification) and liquid chromatography–tandem mass spectrometry (LC/MS/MS) were used for extraction and analysis to determine the sample residues. The results of recovery tests in processed and unprocessed pepper fruits and leaves ranged from 73.6 to 106.2% with relative standard deviations of 1.62–12.4%. Among various processes, washing and parboiling (78.4–85.8% at single and 75.7–89.9% at double dose) and drying after washing and parboiling (95.3–97.3% at single dose) were the most effective household methods to attenuate the analyte residues in pepper fruits and leaves, respectively. We conclude that processing leads to extensive reduction of pesticide residue levels in pepper fruits and leaves, particularly following washing and cooking operations.

Keywords: QuEChERS; Food processing; Pepper fruits; Pepper Leaves; LC/MS/MS.

545. Simultaneous Determination of Aminopyrine and Antipyrine in Porcine Muscle, Milk, and Eggs Using Liquid Chromatography with Tandem Mass Spectrometry

Jin-A Park ,Dan Zhang, Seong-Kwan Kim,Sang-Hyun Cho , Soo-Min Cho, Hee Yi , Jae-Han Shim , Jin-Suk Kim, A. M. Abd El-Aty and Ho-Chul Shin

The concentrations of residual aminopyrine and antipyrine in porcine muscle, milk, and egg samples were analyzed using liquid chromatography with tandem mass spectrometry after undergoing a series of sample pretreatment steps. Owing to an ion suppression effect, matrix-matched calibrations were used for analyte quantitation with determination coefficients (R^2) $\geq$ 0.9931. The recovery rates for aminopyrine and antipyrine in various matrices at two spiking levels (5 and 10 ng/g) fell in the range of 60.96-68.87 and 61.87-66.99%, respectively. Meanwhile, the intra- and inter-day precisions (expressed as relative standard deviation) were 1.02-12.95 and 1.71-5.50%, respectively. The method's detection limit (1 ng/g) was very low, thus enabling the detection of low residue levels. The applicability of the developed method was demonstrated with actual market samples and none of the tested analytes was detected in any of the samples.

Keywords: Aminopyrine; Animal products; Antipyrine; Pyrazolone derivatives; Tandem mass spectrometry.

546. Simultaneous Detection of Bacitracin and Polymyxin B in Livestock Products Using Liquid Chromatography with Tandem Mass Spectrometry

Dan Zhang , Jin-A Park1, Dong-Soon Kim,Na-Hyun Kim , Seong-Kwan Kim,Kyeong-Su Cho,Dana Jeong , Jae-Han Shim A. M. Abd El-Aty and Ho-Chul Shin

With the overarching aim to develop a simple and reliable method for the quantitative analysis of polypeptide antibiotics in various livestock products, the content of bacitracin, and polymyxin B in pork, beef, chicken, milk, and eggs was analyzed using colistin sulfate as an internal standard. The extracted samples were eluted via solid-phase extraction using 2% formic acid in acetonitrile/methanol (1:1, v/v). The two polypeptides were identified and quantified based on the intensities of mass fragments from the respective triply charged precursor ions (bacitracin: 474.97 amu and polymyxin B: 402 amu) at the defined retention time windows using liquid chromatography with electrospray ionization tandem mass spectrometry in time-scheduled multiple reaction monitoring mode. The calibration curves showed good linearity over the concentration range 50–2500 ng/mL with determination coefficients = 0.991. The mean recoveries were in the range 80.3–88.8% with relative standard deviations <13% for all samples. The limits of quantitation ranged from 30–250 ng/g. The developed method was applied to market samples, but the target analytes were not detected in any of the samples. The developed method is reliable for the simultaneous detection of bacitracin and polymyxin B in pork, beef, chicken, milk, and eggs.

Keywords: Bacitracin; Colistin B; Livestock products; Polymyxin B ; Solid-phase extraction.

547. Dietary-Flavonoid-Rich Flowers of Rumex Nervosus Vahl: Liquid Chromatography with Electrospray Ionization Tandem Mass Spectrometry Profiling and in Vitro Anti-Inflammatory Effects

Kebede Taye Desta,Gon-Sup Kim,Gyeong Eun Hong , Yun- Hi Kim , Won Sup Lee,Soo Jung Lee, Jong Sung Jin , A. M. Abd El-Aty, Ho-Chul Shin, Jae-Han Shim and Sung Chul Shin

Rumex nervosus is a plant species found widely in Eastern Africa and the Arabian Peninsula. In addition to its uses in traditional medicinal, the plant shows various biological activities, such as antiviral, antibacterial, and antioxidant activity. In this study, nine flavonols, six flavones, three flavanones, and one flavanol were characterized from the flowers of R. nervosus using liquid chromatography with electrospray ionization tandem mass spectrometry and literature data. Validation data indicated that the determination coefficients (R^2) were $\geq$ 0.9914. The limits of detection and quantification were in the ranges of 0.15-1.24 and 0.50-4.13 mg/L, respectively. Recoveries at 10 and 50 mg/L were 71.1-110.2 and 65.4-115.1%, with relative standard deviations of 7.4-40.1 and 2.1-13.0%, respectively. Quercetin 3-O-rhamnoside (10) was the dominant component, contributing 30.8% of total flavonoids (1003.0 $\pm$ 26.2 mg/kg fresh flower sample), whereas luteolin 6-C-glucoside (3) was the lowest yielding compound (0.1%). The 19 flavonoids identified were characterized for the first time. In vitro anti-inflammatory studies showed that this

mixture can suppress the production of inflammatory mediators, including inducible nitric oxide synthase, cyclooxygenase-2, kappa B inhibitor, and interleukin-1β, by down-regulating the nuclear factor-kappa B and mitogen-activated protein kinases pathways. The results of this study may provide information for processing R. nervosus as a potential source of functional food.
Keywords: Anti-Inflammatory effects; Flavonoids; Liquid Chromatography mass spectrometry; Rumex nervosus.

548. Single-Step Multiresidue Determination of Ten Multiclass Veterinary Drugs in Pork, Milk, and Eggs Using Liquid Chromatography with Tandem Mass Spectrometry

Dan Zhang,Dong-Soon Kim,Seong-Kwan Kim, Kyeong - Su ChoDana Jeong Jae - Han ShimJin-Suk Kim , A. M. Abd El-Aty and Ho-Chul Shin

A multiclass, multiresidue determination method is reported for the detection of ten veterinary drugs, including scopolamine, metoclopramide, acriflavine, berberine, tripelennamine, diphenhydramine, acrinol, triamcinolone, loperamide, and roxithromycin in pork, milk, and eggs. The method involves a simple extraction using 0.1% formic acid in acetonitrile, followed by defatting with n-hexane, centrifugation, and filtration prior to liquid chromatography with tandem mass spectrometric analysis. As ion suppression and enhancement effects are reported, matrix-matched calibrations are used for quantification, with determination coefficients =0.9765. For the majority of the tested analytes, the intra- and interday accuracy (expressed as recovery %) range from 70.6 to 94.6% and from 70.1 to 93.3%, respectively, and the precision (expressed as relative standard deviation) ranges from 0.5 to 19.8% and from 2.8 to 18.4% in all matrices. The limits of quantification range between 0.5 and 10 ng/g. The validated tandem mass spectrometry method is successfully applied to market samples; the target analytes are not detected in any of the tested samples. In terms of accuracy, no extract cleanup is deemed necessary. The developed method is feasible for the simultaneous detection of the tested analytes in pork, milk, and eggs.
Keywords: Animal food products; Liquid-phase extraction; Multiresidue analysis; Tandem mass spectrometry; Veterinary drugs.

549. Lessons from Nature: Sources and Strategies for Developing AMPK Activators for Cancer Chemotherapeutics

Richard T. Arkwright, Rahul Deshmukh, Nikhil Adapa, Ryan Stevens, Emily Zonder, Zhongyu Zhang, Pershang Farshi, Reda Saber Ibrahim Ahmed, Hossny Awad El-Banna, Tak-Hang Chan and Q. Ping Dou

Adenosine Monophosphate-Activated Protein Kinase or AMPK is a highly-conserved master-regulator of numerous cellular processes, including: Maintaining cellular-energy homeostasis, modulation of cytoskeletaldynamics, directing cell growth-rates and influencing cell-death pathways. AMPK has recently emerged as a promising molecular target in cancer therapy. In fact, AMPK deficiencies have been shown to enhance cell growth and proliferation, which is consistent with enhancement of tumorigenesis by AMPK-loss. Conversely, activation of AMPK is associated with tumor growth suppression via inhibition of the Mammalian Target of Rapamycin Complex-1 (mTORC1) or the mTOR signal pathway. The scientific communities' recognition that AMPK-activating compounds possess an anti-neoplastic effect has contributed to a rush of discoveries and developments in AMPK-activating compounds as potential anticancer-drugs. One such example is the class of compounds known as Biguanides, which include Metformin and Phenformin. The current review will showcase natural compounds and their derivatives that activate the AMPK-complex and signaling pathway. In addition, the biology and history of AMPK-signaling and AMPK-activating compounds will be overviewed, their anticancer-roles and mechanisms-of-actions will be discussed, and potential strategies for the development of novel, selective AMPK-activators with enhanced efficacy and reduced toxicity will be proposed.
Keywords: AMPK; AMPK-activators; AMPK-Signaling pathway; Aspirin; BCA2; Cancer; Chemotherapy; Drug discovery; Metformin; Natural compounds; Salicylate.

550. Synthesis and Anti - Inflammatory Evaluation of New 1 , 3 , 5 -Triaryl – 4 , 5 – Dihydro - 1H-Pyrazole Derivatives Possessing an Aminosulphonyl Pharmacophore

Khaled R. A. Abdellatif, Mohamed A. Abdelgawad, Heba A. H Elshemy,Shahinda S. R. Alsayed and Gehan Kamel

A novel series of 2-pyrazoline derivatives 13a-l was synthesized via aldol condensation of 4-substituted acetophenones with appropriately substituted aldehydes followed by cyclization of the formed chalcones with 4-hydrazinobenzenesulfonamide hydrochloride. The chemical structures of the target pyrazoline derivatives were proved by means of IR, (1)H NMR, (13)C NMR, mass spectroscopy and elemental analyses data. All the synthesized compounds were evaluated for their cyclooxygenase selectivity, anti-inflammatory and ulcerogenic liability. While compounds 13e, 13h and 13i showed moderate COX-2 selectivity in vitro and good anti-inflammatory activity in vivo, compound 13i showed the highest anti-inflammatory activity that is very close in potency to the reference drug (celecoxib) with better gastric profile than celecoxib.
Keywords: Anti; Inflammatory; Cyclooxygenase Inhibition; Dihydropyrazole.

551. Flavonoid Profiles of Immature and Mature Fruit Tissues of Citrus Grandis Osbeck (Dangyuja) and Overall Contribution to the Antioxidant Effect

Eun Ae Yua, Gon-Sup Kimb, Ji Eun Leea, Semin Park, Song Yia,Soo Jung Lee, Jae Hoon Kimd, Jong Sung Jine, A. M. Abd El-Aty,Jae-Han Shimg and Sung Chul Shin

Citrus fruits are a valuable functional food and their peel is used in East Asian folk medicine. In this study, the polar components

of the fruit tissues of Citrus grandis Osbeck were analyzed using high-performance liquid chromatography–tandem mass spectrometry and compared with reported data. Among the 13 characterized compounds, eight flavonoids and one coumarin were identified for the first time in fruit tissues. The total amount of the identified components was the largest for the immature fruit peel, followed by mature fruit peel, mature fruit flesh, and immature fruit flesh. Naringin (2) and neohesperidin (3) were particularly rich in all samples. The antioxidant activity of the flavonoids extracted from fruit tissues increased in a dose-dependent manner. The activity of the fruit peels was significantly higher than that of the fruit flesh.

Keywords: Citrus grandis; Dangyuja; LC; MS; MS; Flavonoids; Antioxidant effect.

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552. Simple Extraction Method Using Syringe Filter for Detection of Ethephon in Tomatoes by Negative-Ionmode Liquid Chromatography with Tandem Mass Spectrometry

Soon-Kil Choa, Ji-Mi Choa, A. M. Abd El-Aty, Musfiqur Rahman, Jeong-Heui Choib, Young-Jun Seoa, Ho-Chul Shind and Jae-Han Shim

In this study, a simple, rapid, and sensitive method was developed for the extraction of ethephon from homogenized tomatoes that does not require a cleanup procedure. In a syringe filter, three distinct layers – aqueous, acetonitrile, and n-hexane – are clearly separated after storage at -80°C for 5–10 min. A Dionex IonPac column was used to separate the analyte before detection using negative-ion mode liquid chromatography with tandem mass spectrometry (LC/MS/MS). The matrix effect of the tested analyte was negligibly small and the matched calibration showed a good linearity over a concentration range of 0.01–1.0mg/kg with a correlation coefficient (R^2) of 0.9998. The recovery at three fortification levels (0.1, 0.5 and 1.0mg/kg) was between 82.9 and 108.6% with relative standard deviations (RSDs) <5.0%. The limit of quantification (0.03mg/kg) was lower than the maximum residue limit (3mg/kg) set by the Ministry of Food and Drug Safety, Republic of Korea. From a field trial, the method developed herein was applied to calculate the decline pattern and predict the pre-harvest residue limits of ethephon in tomatoes. In conclusion, the proposed sample preparation is feasible for the detection of hydrophilic analytes in tomatoes.

Keywords: Plant growth regulator; Tomato; Extraction; Residue; Tandem mass spectrometry; Analysis; Method validation.

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553. A Combination of Solid-Phase Extraction and Dispersive Solid-Phase Extraction Effectively Reduces the Matrix Interference in Liquid Chromatography – Ultraviolet Detection During Pyraclostrobin Analysis in Perilla Leaves

Waziha Farhaa, Musfiqur Rahmana, A. M. Abd El-Aty, Da-I. Junga, Humayun Kabira, Jeong-Heui Choi, Sung-Woo Kim, So Jeong Ima,Young-Jun Leea, Ho-Chul Shin, Chan-Hyeok Kwon, Young-Wook Sond,Kang-Bong Leed and Jae-Han Shim

Perilla leaves contain many interfering substances; thus, it is difficult to protect the analytes during identification and integration. Furthermore, increasing the amount of sample to lower the detection limit worsens the situation. To overcome this problem, we established a new method using a combination of solid-phase extraction and dispersive solid-phase extraction to analyze pyraclostrobin in perilla leaves by liquid chromatography with ultraviolet absorbance detection. The target compound was quantitated by external calibration with a good determination coefficient (R2 = 0.997). The method was validated (in triplicate) with three fortification levels, and 79.06– 89.10% of the target compound was recovered with a relative standard deviation <4. The limits of detection and quantification were 0.0033 and 0.01 mg/kg, respectively. The method was successfully applied to field samples collected from two different areas at Gwangju and Muan. The decline in the resiudue concentrations was best ascribed to a first-order kinetic model with half-lives of 5.7 and 4.6 days. The variation between the patterns was attributed to humidity

Keywords: Pyraclostrobin;Perilla leaf;LC-UVD; Interferences; SPE-d-SPE Combination.

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554. Detection of Pyridaben Residue Levels in Hot Pepper Fruit and Leaves by Liquid Chromatography – Tandem Mass Spectrometry: Effect of Household Processes

Sung-Woo Kim, A. M. Abd El-Aty, Musfiqur Rahmana,Jeong-Heui Choi, Ok-Ja. Choid, Gyu-Seek Rheee, Moon-Ik Change,Heejung Kime, Morad D. N. Abid, Sung Chul Shing and Jae-Han Shim

Following quick, easy, cheap, effective, rugged and safe (QuEChERS) and LC/MS/MS analysis, pyridaben residual levels were determined in unprocessed and processed hot pepper fruit and leaves.

The linearities were satisfactory with determination coefficients (R^2) in excess of 0.995 in processed and unprocessed pepper fruit and leaves. Recoveries at various concentrations were 79.9– 105.1% with relative standard deviations ≤15%. The limits of quantitation of 0.003–0.012mg/kg were very low compared with the maximum residue limits (2–5mg/kg) set by the Ministry of Food and Drug Safety, Republic of Korea.

The effects of various household processes, including washing, blanching, frying and drying under different conditions (water volume, blanching time and temperature) on residual concentrations were evaluated. Both washing and blanching (in combination with high water volume and time factor) significantly reduced residue levels in hot pepper fruit and leaves compared with other processes.

In sum, the developed method was satisfactory and could be used to accurately detect residues in unprocessed and processed pepper fruit and leaves. It is recommended that pepper fruit/leaves be blanched after washing before being consumed to protect consumers from the negative health effects of detected pesticide residues

Keywords: Pyridaben;Hot pepper fruit; Leaves; Quechers; Tandem mass spectrometry; Household processing.

Basic Science Sector

555. Analysis of Ddt and its Metabolites in Soil and Water Samples Obtained in the Vicinity of A Closed-Down Factory in Bangladesh Using Various Extraction Methods

M. N. U. Al Mahmud , Farzana Khalil , Musfiqur Rahman , M. I. R. Mamun ,Mohammad Shoeb , A. M. Abd El-Aty , Jong-Hyouk Park , Ho-Chul Shin ,Nilufar Nahar and Jae-Han Shim

This study was conducted to monitor the spread of dichlorodiphenyltrichloroethane (DDT) and its metabolites (dichlorodiphenyldichloroethylene (DDE), dichlorodipheny ldichloroethane (DDD) in soil and water to regions surrounding a closed DDT factory in Bangladesh. This fulfillment was accomplished using inter-method and inter-laboratory validation studies. DDTs (DDT and its metabolites) from soil samples were extracted using microwave-assisted extraction (MAE), supercritical fluid extraction (SFE), and solvent extraction (SE). Inter-laboratory calibration was assessed by SE, and all methods were validated by intra- and inter-day accuracy (expressed as recovery%) and precision (expressed as relative standard deviation (RSD)) in the same laboratory, at three fortified concentrations (n=4). DDTs extracted from water samples by liquid-liquid partitioning and all samples were analyzed by gas chromatography (GC)-electron capture detector (ECD) and confirmed by GC/mass spectrometry (GC/MS). Linearities expressed as determination coefficients (R^2) were =0.995 for matrix-matched calibrations. The recovery rate was in the range of 72–120 and 83–110 %, with <15 % RSD in soil and water, respectively. The limit of quantification (LOQ) was 0.0165 mg kg^{-1} in soil and 0.132 µg L^{-1} in water. Greater quantities of DDTs were extracted from soil using the MAE and SE techniques than with the SFE method. Higher amounts of DDTs were discovered in the southern (2.2–936×102 mg kg^{-1}) or southwestern (86.3–2067×102 mg kg^{-1}) direction from the factory than in the eastern direction (1.0–48.6×102 mg kg^{-1}). An exception was the soil sample collected 50 ft (15.24 m) east (2904×102 mg kg^{-1}) of the factory. The spread of DDTs in the water bodies (0.59–3.01 µg L^{-1}) was approximately equal in all directions. We concluded that DDTs might have been dumped randomly around the warehouse after the closing of the factory

Keywords: Bangladesh; DDT ; Metabolites ; Inter-Laboratory Microwave; Assisted extraction; Supercritical fluid extraction.

556. Synthesis, Cyclooxygenase Inhibition , and Anti-Inflammatory Evaluation of Novel Diary lheterocycles with A Central Pyrazole , Pyrazoline , or Pyridine Ring

Khaled R. A. Abdellatif , Eman K. A. Abdelall ,Wael A. A. Fadaly and Gehan M. Kamel

Five groups of diarylheterocycles with a central pyrazole ring (12a–d), pyrazoline ring (14a–d), or pyridine ring (15a–d, 16a–d and 17a–d) were synthesized and evaluated in vitro for COX-1/COX-2 inhibitory activity and in vivo for anti-inflammatory activity. All compounds that possessed anti-inflammatory activity were assessed fortheir ulcerogenic liability in comparison with

ibuprofen and celecoxib. The pyrazole derivative 12b and the pyrazoline derivative 14b were the least ulcerogenic compounds with relative ulcerogenicities to celecoxib 0.85 and 0.90 respectively.
Keywords: Diarylheterocycles;Pyrazole;Pyrazoline Cyanopyridine;Cyclooxygenase;2 Anti-inflammatory activity.

557. Simultaneous Determination of Arbutin and its Decomposed Product Hydroquinone in Whitening Creams Using High-Performance Liquid Chromatography with Photodiode Array Detection: Effect of Temperature and Ph on Decomposition

J. S. Jeon, B. H. Kim, S. H. Lee, H. J. Kwon, H. J. Bae, S. K. Kim, J. A Park, J. H. Shim, A. M. Abd El-Aty and H. C. Shin

Objective Arbutin is an effective agent for the treatment of melanin disorders. Arbutin may be converted to hydroquinone under conditions of high temperature, ultraviolet (UV) radiation and dilute acid. The aim of the current study was to develop an analytical method to determine the levels of arbutin and hydroquinone in whitening cosmetic products using high-performance liquid chromatography with photodiode array detection (HPLC-DAD). In addition, we investigated the effects of high temperature and pH on the decomposition of arbutin.
Methods Samples extracted using two-step sonications were separated on a C18 column using a gradient mobile phase consisting of water and methanol. A 60-mm (40 µL) DAD cell was used to enhance the sensitivity of hydroquinone determination. Thermal decomposition of arbutin was evaluated at temperatures ranging from 60 to 120°C for 1–36 h.
Results The method showed good linearity (R2 = 0.9997), precision (relative standard deviation, RSD < 5%) and acceptable extraction recovery (90–102.6%). The limits of quantitation for arbutin and hydroquinone were 0.0085 and 0.0119 µg mL-1, respectively. One sample of 21 cosmetic products tested contained arbutin at a concentration 1.61 g 100 g-1 cream and 0.12 g 100 g-1 cream of hydroquinone. Arbutin (327.18 ppm) decomposed after 6 h at 120°C and produced 10.73 ppm of hydroquinone.
Conclusion The developed method is simple to detect both arbutin and hydroquinone simultaneously in cosmetic products, at an adequate level of sensitivity. Notably, temperature and pH did not influence the decomposition of arbutin to hydroquinone in a 2% arbutin cream.
Keywords: Arbutin;High-Performance liquid chromatography; Hydroquinone;Temperature;Whitening cosmetics.

558. Correlation Between Chemical Composition and Antinanobacterial Activity of Three Essential Oils of Lamiaceae Family

K. Abo-EL-Sooud,M.M. Hashem, A. Q. Gab-Allaha and Ahmed Bahy-EL-Dien

The chemical composition and in vitro anti-nanobacterial activity of Origanum majorana (Marjoram), Rosmarinus officinalis

(Rosemary) Salvia officinalis (Sage) essential oils of the Lamiaceae family were compared. Hexane extract of the three oils were analyzed by gas chromatography coupled with mass spectrometry (GC/MS). To evaluate the in vitro anti-nanobacterial activity of these aromatic oils against nanobacteria isolated from human kidney stones a modified micro-dilution inhibitory test in 96-well plates was used. An inoculation of nanobacteria in Dulbecco's modified Eagle's medium (DMEM) supplemented with 10% gamma-irradiated fetal calf serum (γ-FBS) under cell culture conditions with tested oils in different concentrations and determination of inhibition by weekly measurement of the absorbance for 42 days.

The GC/MS analysis resulted in the identification of fifteen compounds from each of tested oil. The prevailing chemical components of sage essential oil were 1,8-Cineole (78.13%), Cis-Ocimene (9.23%) and Camphor (4.33%). Rosemary essential oil components were identified as 1,8-Cineole (61.70%), à-Pinene (17.05%) and Bornanone (9.06%), While the analysis of marjoram oil revealed somewhat different major constituents as l-4-Terpineol (24.76%), ç-Terpinene (14.17%), Sabinene (11.86%), and à-Humulene (10.75%).

Only sage oil was found to be highly bacteriostatic at 125 µg ml-1 and bactericidal at 250 µg ml-1. While marjoram and rosemary essential oils had no activity against nanobacterial isolates even at higher concentrations. The presence of all types of monoterpenes as the predominant constituents of sage oil could be responsible for the potential anti-nanobacterial activity. The antibacterial activity depends not only on chemical composition of functional groups but also the percent of active constituents with different biochemical properties.

Keywords: GC/MS; Anti-nanobacterial activity; Lamiaceae; 1,8;Cineole.

559. Synergistic Hepatoprotective Effect of Grape Juice with Date Palm Fruit Methanolic Extracts

A. H. Atta, K. Abo-EL-Sooud, Sohair Saied Ahmed, Shereen Ibrahim and Shimaa Zaher

The present work was carried out to evaluate the hepatoprotective effect of grape juice, date palm fruit methanolic extracts (600 mg/kg b.wt.) and their combination (1:1 or 1:2) given orally for 21 day against CCl4 intoxication in rats. There was no significant alteration in most of the hematological parameters tested. Their administration in CCl4-intoxicated rats significantly (P >0.05) decreased ALT and GGT activity in serum of rats as compared to rats treated with CCl4 only. Oral administration of methanolic extract of grapes and date palm fruit (1: 1 or 1:2 w/w) significantly (P > 0.05) decreased ALT, AST and GGT activity in serum of rats as compared to rats treated with CCl4 only. The tested extracts significantly (P>0.05) decreased glucose, bilirubin, serum triglycerides and cholesterol levels as compared to rats treated with CCl4 only. However, their administration significantly (P >0.05) increased protein level in serum of rats as compared to rats treated with CCl4 only. In conclusion the use of combination grape juice, date palm fruit methanolic extracts (1:2) caused marked hepatoprotective effect as confirmed by the histopathological examination.

Keywords: GC/MS; Grape; Date palm; Hepatoprotective; Synergism.

560. Comparative Pharmacokinetics Using A Microbiological Assay and High Performance Liquid Chromatography Following Intravenous Administration of Cefquinome in Lactating Goats with and Without Experimentally Induced Staphylococcus Aureus Mastitis

S.A. El Badawy, A.M. Amer, G.M. Kamel, K.M. Eldeib, P.D. Constable

Cefquinome pharmacokinetic values were compared using a microbiological assay (MA) and high performance liquid chromatography (HPLC) in lactating goats with and without experimentally induced Staphylococcus aureus mastitis. Five healthy lactating goats received an IV injection of cefquinome sulfate (75 mg, equivalent to cefquinome at 3.0 mg/kg BW). The same dose of cefquinome sulfate was administered IV after clinical mastitis was induced by intracisternal infusion of 100 cfu of S. aureus ATCC 29213. Jugular venous blood and milk samples were obtained periodically after cefquinome administration in healthy and mastitic goats, and plasma and skimmed milk cefquinome concentrations were determined using MA and HPLC. Deming regression and Bland-Altman plots indicated equivalence of MA and HPLC. Both MA and HPLC analytical methodologies yielded statistically similar mean values for the cefquinome concentration-time relationship in plasma and skimmed milk and similar values for almost all calculated pharmacokinetic indices; however, HPLC had a lower limit of quantification LOQ and coefficient of variation, and a higher correlation coefficient for standard curves. Noncompartmental pharmacokinetic (PK) analysis indicated that mastitis decreased the mean residence time of cefquinome in plasma but did not change the mean residence time in skimmed milk. Skimmed milk cefquinome concentrations after IV injection remained below the MIC (0.25 g/mL) for S. aureus at every measurement time except at 6 h after injection, and clinical mastitis remained present for at least 5 days in treated goats. In conclusion, MA provides a simple, practical and inexpensive method for measuring cefquinome concentrations in plasma and skimmed milk samples from goats, while, HPLC proved to be more sensitive, specific and accurate. Mastitis increased cefquinome clearance compared to healthy goats which emphasizes the importance of performing pharmacokinetic studies in infected animals. Additional studies are required to determine whether intramammary cefquinome is effective in treating S. aureus mastitis in goats.

Keywords: Intramammary; HPLC; Microbiological assay; Pharmacokinetics; Electrical conductivity; Sodium concentration .

561. In Vitro Antinano-Bacterial Activity and Gc/Ms Analysis of Citrus Limon Essential Oil

Mohamed Mohamed Mohamed Hashem

The chemical composition and anti-nanobacterial activity of essential oil obtained from fruits peel of Citrus limon (family Rutaceae) were determined. Hexane extract of lemon oil was analyzed by gas chromatography coupled with mass spectrometry (GC/MS). To evaluate the in vitro anti-nanobacterial activity of this aromatic oil against nanobacteria (NB) isolated from human kidney stones a modified micro-dilution inhibitory test in 96-well

plates was used. An inoculation of NB in Dulbecco's modified Eagle's medium (DMEM) supplemented with 10% gamma-irradiated fetal calf serum (γ-FBS) under cell culture conditions with lemon oil in different concentrations and determination of inhibition by weekly measurement of the absorbance for 42 days. Bactericidal or bacteriostatic effects of oil were distinguished by subsequent subculture and monitoring for increasing absorbance. Lemon oil was found to be highly bacteriostatic at 250 µg ml-1. The GC/MS analysis resulted in the identification of fifteen compounds. The major components were Limonene (96.68%), a-Myrcene (1.17%), a-Pinene (0.81%), Sabinene (0.71%) and-Terpinene (0.20%). The presence of all types of monoterpenes as the predominant constituents of lemon could be responsible for the potential anti-nanobacterial activity. The results speculate a hope for the progress of many novel natural source modules which in future may serve as an alternative medicine.

Keywords: GC/MS; Anti-nanobacterial activity; Citrus limon; Limonene.

562. Detecting Fludioxonil Residues in Brown Rice and Rice Straw Using Gas Chromatography-Nitrogen Phosphorus Detector

Ah-Young Ko ,A. M. Abd El-Aty , in Jang , Jeong-Heui Choi , Md. Musfiqur Rahman ,Sung-Woo Kim ,Ho-Chul Shin and Jae-Han Shim

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In the present study, brown rice was steeped in 20 % wettable powder fludioxonil for 24 h, subsequently germinated, and transplanted in paddy fields. The harvested rice was tested at 156 days to detect residue levels using gas chromatography-nitrogen phosphorus detector. Validation was carried out to assess the following parameters: linearity, limit of detection and limit of quantitation (LOQ), recovery, and storage stability. Using matrix-matched calibrations, the determination coefficients were >0.999 in both matrices. Mean recoveries were 73.5–101.0 % with relative standard deviations <10 % in both matrices. The LOQ (0.006 mg/kg) was lower than the maximum residue limit (MRL = 0.02 mg/kg) set by the Ministry of Food and Drug Safety, Republic of Korea. The developed method was applied successfully, and no residues were detected in field-incurred rice and/or rice straw samples.

Keywords: Analysis;Fungicide; Rice; Rice straw gas Chromatography contaminant.

563. Characterization of Secondary Metabolite Compounds Correlated with the Seasons in Artemisia Princeps Var. Orientalis (Pamp.) H. Hara Leaves Using Direct Sample Injection and Gas Chromatography–Mass Spectrometry: Contribution to Phytotoxicity

M. I. R. Mamun, A. M. Abd El-Aty, Musfiqur Rahman, Jeong-Heui Choi, Kyeong Won Yun, Ho-Chul Shin and Jae-Han Shim

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Leaves from a natural population of Artemisia princeps var. orientalis (Pamp.) H. Hara were collected monthly from April through October and characterized for composition of secondary metabolite compounds and their phytotoxic effects on seed germination and seedling growth of Achyranthes japonica and Lactuca sativa. The compounds were identified using gas chromatography/mass spectrometry (GC/MS) coupled with a solvent-free solid injector (SFSI). GC/MS analyses of all samples revealed qualitative variability in the composition of secondary metabolites. The greatest number of compounds was identified in July (56) followed by September (30) and April (24), and the lowest number was found in June (2) and August (2). Among 92 compounds, the major compounds were various terpenes (23) (mono-, sesqui, di-, and tri-terpenes) followed by heterocyclic compounds (18) and hydrocarbons (14). The higher the concentration of the secondary metabolites, the lower the seed germination and seedling growth of A. japonica and L. sativa. Plant samples collected in July and August were most detrimental. Taken together, variability in the secondary metabolites compounds of A. princeps var. orientalis was verified during different seasons, and the compounds were successfully identified by a combination of SFSI and GC/MS. Notably, the antimicrobial and antioxidative effects were inconsistent throughout the various seasons.

Keywords: Seasonal ;Variations ;Artemisia ; Secondary Metabolites Solvent; Free injection GC/MS.

564. Chitosan-Benzofuran Adduct for Potential Biomedical Applications: Improved Antibacterial and Antifungal Properties

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Der Pharmacia Lettre, 7 (10): 107-117 (2015)

Chitosan-benzofuran adduct showed better antifungal and antibacterial properties compared to chitosan or benzofuran alone. The new polymer hydrogel has been characterized using FTIR, SEM, DSC, TGA and XRD. FTIR proved the formation of Schiff's base reaction at 1632 cm-1, between the chitosan's amino group and the khellinone's ketonic group. The X-ray diffraction patterns of chitosan-benzofuran showed the formation of a porous xerogel network.

The TGA and DSC results were in accordance with the results obtained from the SEM. The TGA and DSC revealed slight loss in the chitosan-benzofuran' thermal stability compared to chitosan hydrogel and that could be regarded to the increase in porosity as shown in the SEM. The novel chitosan-benzofuran hydrogel has shown an outstanding antifungal and antibacterial effect. Moreover, the cellular cytotoxicity of baby hamster kidney cells culture by adding different concentrations of chitosan-benzofuran hydrogel were greater than those obtained from benzofuran or chitosan alone as they were 4.81±2%, 5.27±2% and 9.43±5%, respectively

Keywords: Chitosan; Chitosan; Benzofuran hydrogel; Characterization; Schiff'S base; Antimicrobial activities.

Dept. of Poultry Diseases

565. Efficacy of Certain Feed Additives for the Prevention of Campylobacter Jejuni Infection in Broiler Chickens

Wafaa A. Abd El-Ghany, M.H. Awaad and S.R. Nagwa

In this study, the efficacy of acidifiers (lactic and formic acids) and probiotic preparations containing Pediococcus acidilactici (P. acidilactici) and Saccharomyces boulardii (S. boulardii) in reducing of Campylobacter jejuni (C. jejuni) infection in broiler chickens was investigated. One hundred and three day old broiler chicks were used. Three birds were euthanized for C. jejuni re-isolation at day old. One hundred chicks were assigned into 4 equal groups each, 25 birds. Groups 1, 2 and 3 were fed on ration containing acidifiers, P. acidilactici and S. boulardii, respectively, from day old till 5 weeks old. Chicks of group 4 were fed on plain ration (control). At 2 weeks of age, each bird was orally challenged with C. jejuni. Groups were kept for 3 weeks recording signs and mortalities. Faecal swabs were collected at different intervals for C. jejuni shedding. Liver and intestine were collected weekly for C. jejuni re-isolation. At 5 weeks of age, all birds were subjected for post-mortem lesions scoring of C. jejuni. Results cleared more severe signs of greenish diarrhea in control than treated birds with no mortalities in all groups. Significant (p<0.05) reduction of C. jejuni shedding and re-isolation rates as well as lesions scoring was seen in groups treated with S. boulardii and P. acidilactici followed by acidifiers over control birds. In conclusion, both acidifiers and probiotic preparations greatly reduced and eliminated C. jejuni infection in broiler chickens.
Keywords: Campylobacter jejuni; Acidifiers; Probiotics; Chickens; Protection.

566. Influence of Feed Sanitation on Zootechnical Performance, Prevalence, Immune Status and Carcass Trait of Salmonella Typhimurium Infected Broiler Chickens

Wafaa Abd El-Ghany Abd El-Ghany, Mohammed Ahmed Tony and Samah Mohamed

An experiment was conducted to determine the effects of a commercial acidifier feed additive product containing formaldehyde on performance, Salmonella typhimurium prevalence and immune status of broiler chickens. Three hundreds, day-old chicks (Hubbard breed) were randomly distributed into three treatment groups (4 replicates each) using 25 chicks per replicate on floor pens. Control (C) birds were offered non-supplemented basal diets. Treatment groups 1 and 2 (T1 and T2) were fed diets containing product at 250 and 500 g tG1 feed, respectively. Feed and water were offered ad-libitum for 35 days experimental period. Feed consumption and body weight were recorded weekly to calculate body weight gain and feed conversion. Blood samples were collected by time intervals to evaluate the immune status of the birds against some vaccines. At day 21 of age,20 birds were chosen randomly from each group (5 from each replicate) and were challenged orally with 1 mL containing 106 colony forming unit (CFU

mLG1) Salmonella typhimurium and were kept under observation for two weeks. At the end of the experimental period, 20 birds were chosen randomly from each group (5 from each replicate) to compare carcass yield. The results revealed that body weight gain was significantly (p<0.05) improved in chicks fed on diets containing product compared with the control one. The best feed conversions were recorded in T2. The results of the Salmonella typhimurium challenge experiment showed that both doses of the products significantly (p#0.05) reduced the signs, mortalities, gross lesions, shedding rate and re-isolation of Salmonella typhimurium. Dressing percentage and liver weight were non-significantly different between groups. Supplementation of the broiler diets significantly enhanced the immune responses measured against the vaccines used. It can be concluded that, using acidifiers and formaldehyde as feed additives for feed sanitation reflected positively on the zootechnical performance of broiler chickens, reduced the incidence of salmonellosis and enhanced the immune status of broiler chickens.
Keywords: Formaldehyde; Broilers; Acidifiers; Salmonellosis; Performance; Immunity.

Dept. of Surgery Anesthesiology And Radiology

567. Pneumopericardium Secondary to Pneumomediastinum in A Golden Retriever Dog

ElhamA.Hassan, FaisalA.Torad and AshrafA.Shamaa

Pneumopericardium is a rare finding that has been previously reported following spontaneous, traumatic, or iatrogenic causes. A 3-year old Golden Retriever dog was admitted with respiratory distress after falling from a height. Clinical and electrocardiographic findings were nonspecific. Thoracic radiography revealed hyperinflated lung with sharp outlining of the mediastinal structures. A well-demarcated region of radiolucent gas opacity was seen surrounding the cardiac silhouette. Echocardiography revealed intense hyper-reflective shadows all over the heart. Echocardiographic measurements were within the reference range. The dog responded well to conservative medical therapy. Pneumopericardium was reported secondary to pneumomediastinum; pneumopericardium is self-limiting unless other complications develop.
Keywords: Pneumopericardium; Pneumomediastinum; Dog.

568. Gastroesophageal Intussusception in A 50-Day-Old German Shepherd Dog

FaisalA.Torad and ElhamA.Hassan

Gastroesophageal intussusception is a rare but life-threatening condition that requires immediate diagnosis and urgent surgical intervention. We describe the clinical, radiographic, ultrasonographic, and gross pathologic examinations of a 50-day-old German Shepherd dog with gastroesophageal intussusception associated with esophageal dilatation. The dog was brought to the clinic 10 days after weaning with a history of regurgitation, persistent vomiting, hematemesis, and dyspnea. On admission, the dog was lethargic with signs of shock and died just before

surgery. Gastroesophageal intussusception should be considered in the differential diagnosis in dogs with progressive vomiting or regurgitation especially at the weaning time.
Keywords: Intussusception; Dog; Stomach; Esophagus; Gastroesophageal.

569. Canine Neonatal Transcranial Ultrasonography from Birth Until Closure f Bregmatic Fontanelle

Elham A.Hassan , FaisalA.Torad , Omar S.El-Tookhy and Ashraf A.Shamaa

Topics in Companion Animal Medicine, 30: 5-9 (2015) IF: 1.411

Ultrasonography is a valuable diagnostic tool that has been used for diagnosis of neonatal brain diseases. The purpose of the present study was to describe the sequential ultrasonographic appearance of the normal canine neonatal brain from birth till closure of the bregmatic fontanelle. In total, 16 clinically normal neonates of mixed breed dogs were used. The bregmatic fontanelle was used as an acoustic window to record 5 transcranial scans (3 transverse, 1 sagittal, and 1 parasagittal scans) at 3, 10, 20, and 30 days of age. The appearance, echogenicity, and developmental differentiation of the structures within the cranium were described. Good images were obtained at 10 and 20 days of age. At 30 days of age, the obtained images presented poor details, as the fontanelle was small. Data obtained from this study represent the basis of brain ultrasound in neonates until 30 days of age, which could be beneficial in diagnosing congenital brain diseases.
Keywords: Brain; Ultrasound; Dog; Neonate.

570. Development of A Model to Induce Transient Synovitis and Lameness in the Hip Joint of Dogs

Elham A. Hassan, Nicolaas E. Lambrechts, George E. Moore, Hsin-Yi Weng, Hock Gan Heng and Gert J. Breur

American Journal of Veterinary Research, 76: 869-876 (2015) IF: 1.335

Objective: To develop a model of hip joint synovitis on the basis of intra-articular injection of a sodium urate suspension in dogs and to characterize associated gait changes. ANIMALS 6 healthy adult dogs. PROCEDURES Each dog was sedated, and synovitis was induced by injection of 1 mL of a sodium urate suspension (20 mg/mL) into the right hip joint under ultrasonographic guidance. Observational and instrumented gait analyses to determine temporospatial, kinetic, and kinematic variables were performed prior to and 4, 8, and 24 hours after sedation and synovitis induction.
Results Injection of a sodium urate suspension into the hip joint of healthy dogs resulted in lameness of the ipsilateral pelvic limb as determined by observational and instrumented gait analyses. For all dogs, lameness was clinically detectable within 1.5 to 2 hours after injection, reached its maximum intensity at 4 hours after injection, and had subsided by 24 hours after injection.
Conclusions and Clinical Relevance Results indicated that injection of a sodium urate suspension into the hip joint of healthy dogs reliably induced synovitis and signs of pain and lameness in the ipsilateral pelvic limb that lasted 24 hours. This model can be used in conjunction with instrumented gait analysis to provide information on gait changes associated with hip joint disease and

might be useful for evaluating the efficacy of analgesics or other interventions for the treatment of hip joint disease in dogs.
Keywords: Dog; Hipl joint; Synovitis; Sodium urate; Gait analysis.

571. Two - Dimensional and M - Mode Echocardiographic Measurements in the Healthy Donkey (Equus Asinus)

Elham A. Hassan and Faisal A. Torad

J. of Equine Veterinary Science, 35: 283-289 (2015) IF: 0.871

Limited reports have been found describing heart diseases in donkeys; it is unclear whether this shortage arises from low incidence of heart disease in donkeys or because of the diagnostic challenge especially with the absence of typical clinical signs of cardiac disease in donkeys. The purpose of this study was to establish the normal reference range of echocardiographic measurements of cardiac structures in healthy donkeys using both two-dimensional (2D) and M-mode techniques. Thirty adult clinically healthy donkeys free of cardiovascular disease were used. Standardized 2D and M-mode echocardiographic examinations were performed in nonsedated standing donkeys. Mean, range, standard deviation, and coefficient of variation were calculated for the cardiac parameters. Pearson correlation coefficient was used to determine the correlation between the obtained measurements and body weight. Reference range of normal echocardiographic measurements was established. Weak linear correlation between the echocardiographic measurements and body weight was reported in left ventricular internal diameter in diastole and systole. The reported reference values of echocardiographic measurements and indices may be helpful in diagnosing donkeys with cardiac disease.
Keywords: Echocardiography; Heart; Donkey.

572. Long Term Evaluation of Human Umbilical Cord Blood Mesenchymal Stem Cells in the Management of Total Coronary Occlusion (Experimental Study in Dogs)

Faisal Torad, Mohammed Amer, Ashraf Shamaa, Omar El-Tookhy, Dina Sabry, Laila Rashed, Magdi Abd El Hamid, Soheir Mahfouz and and Doaa Gharib

Asian Journal of Animal Sciences, 9: 266-279 (2015)

Cardiomyocytes in the border zone of an old infarct are condemned to die by necrosis and apoptosis caused by a persistent impairment of the coronary vasodilatory reserve even after successful recanalization of coronary artery total occlusion. Therefore, Chronic Total Occlusion (CTO) remains one of the more challenges for coronary interventions with uncertainty regarding procedural success and long term benefits. Twenty dogs were subjected experimentally to total coronary occlusion; half were treated with human Umbilical Cord Blood derived Mesenchymal Stem Cells (hUCB-MSCs). Clinical, electrocardiographic , echocardiographic, histopathological, biochemical and immunohistochemistry assessments were performed for 6 months at different time intervals. Demonstrated improved systolic function after one month following MSCs injection that was manifested by gradual increase of Fractional

Shortening (FS%) and Ejection Fraction (EF). Electrocardiography exhibited improvement of ECG pattern with resolving of abnormal changes (elevated ST segment and inverted T) till retaining approximately normal ECG. After hUCB-MSCs myocardial infiltrations, specific genes in cardiac tissue were highly expressed indicating the differentiation of hUCB-MSCs into endothelial cells. The markedly increased vWF-positive cells in the damaged zone, suggested that angiogenesis is induced by promoting VEGFR2 expression at cardiac injury sites. This improved ischemia, thereby promoting body repair. Improved cardiac efficiency was expressed differently through various assessment parameters.

Keywords: Coronary; Occlusion; Myocardial; Infarction; Stem Cells.

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573. Ultrasonographic and Histopathological Findings in Rams with Epididymo-Orchitis Caused by Brucella Melitensis

Ashraf M Abu-Seida, Kawkab A Ahmed, Faisal A Torad and Sherif A Marouf

Epididymo-orchitis is one of the most important reproductive diseases in rams caused by various pathogens. The purpose of this study was to describe the clinical, ultrasonographic and histopathological characteristics of epididymo-orchitis caused by Brucella melitensis in rams. Nine rams with a large unilateral scrotal swelling were admitted to the surgery clinic. Full case history, thorough clinical examination, Rose Bengal test (RBT), Microagglutination test, ultrasonographic and histopathological examinations were carried out for all rams. The mean age of the diseased rams was 4±1.7 years. The diseased rams showed positive RBT (++) and the mean antibrucella titer was 1/140±7.8. For rams admitted between 1 to 2 months from the onset of clinical signs, the main ultrasonographic findings included thick hyperechoic scrotum, thick hyperechoic testicular tunics, anechoic fluid into vaginal cavity, enlarged testis, absence of testicular echogenic pattern, wide appearance of the mediastinum testis and multiple hypoechoic testicular and epididymal abscesses. For rams admitted between 2 to 3 months from the onset of clinical signs, hyperechoic multiple testicular abscesses, hyperechoic fibrous foci and thick hyperechoic epididymes were seen. The pathognomonic lesions were multiple focal testicular and epididymal abscesses, microgranulomas and microcalcification, necrosis of germinative epithelium, atrophy of seminiferous tubule with absence of spermatogenesis and interstitial edema associated with inflammatory cells infiltration. Scrotal lymph node showed focal caseous lymphadenitis with capsular edema. In conclusion, the ultrasonographic and histopathological findings of epididymo-orchitis caused by B. melitensis in rams are characteristics and vary depending on the chronological stage of the disease.

Keywords: Brucella Melitensis; Epididymo; Orchitis; Microgranulomas; Rams; Scrotum.

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574. Effect of Propolis on Experimental Cutaneous Wound Healing in Dogs

Ashraf M. Abu-Seida

This study evaluates clinically the effect of propolis paste on healing of cutaneous wound in dogs. Under general anesthesia and complete aseptic conditions, two full thickness skin wounds (3 cm diameter) were created in each side of the chest in five dogs, one dorsal and one ventral, with 10 cm between them.These wounds were randomly allocated into two groups, control group (10 wounds) and propolis group (10 wounds). Both groups were represented in each dog.The wounds were cleaned with normal saline solution and dressed withmacrogol ointment in control group and propolis paste in propolis group, twice daily till complete wound healing. Measurement of the wound area (cm2) was monitored planimetrically at 0, 7, 14, 21, 28, and 35 days after injury. The data were analyzed statistically. The results revealed a significant reduction in the wound surface area in the propolis group after 14 and 21 days compared to control group.The wound reepithelization, contraction, and total wound healing were faster in propolis group than in control group during five weeks of study. In conclusion, propolis paste has a positive impact on cutaneous wound healing and it may be suggested for treating various types of wounds in animals.

Keywords: Dog; Propolis; Skin; Wound.

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575. Synopsis on the Most Common Pathologies of Dolphins

Alaa Eldin Eissa and Ashraf M. Abu-Seida

Dolphins are one of the most iconic species of the marine world. With their playful nature and high intelligence, dolphins have enthralled the hearts of people of all ages from all over the world. The worldwide distribution of dolphins through the diverse global aquatic environments has gifted them with global popularity compared to other aquatic animals in direct contact with the human communities. In the past few decades, deaths, injuries, toxicities, genetic disorders and overfishing were continuously increasing due to faulty anthropogenic activities in th marine environment. The increasing global threats to dolphins' populations have remarkably enhanced the public awareness about these threats and triggered scientific communities to configure reliable/effective solutions. Combating trans-species infectious diseases and development of reliable, safe and cheaper diagnostic as well as therapeutic tools for tissue alterations were the infrastructure of dolphins' veterinary research through the past few decades. However, the veterinary library is suffering from remarkable scarcity of comprehensive literatures about diseases/disorders affecting different body systems of marine mammals. Thus, we present the current review in trial to shed the light on the most common affections of dolphins as a model of the most critically impacted marine mammals.

Keywords: Bottlenose dolphin; Dolphins; Franciscana dolphin; Lobomycosis; Stripped dolphin.

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576. Regenerative Therapy for Equine Osteoarthritis: A Concise Review

Ashraf M. Abu-Seida

Osteoarthritis (OA) is a common cause of lameness in equine and a potential cause of wastage of valuable animals. Furthermore, horse is the ideal large animal model for the preclinical study of cell-based therapy in human joints. In contrast to the drug therapy, regenerative therapy promotes the body's own healing, restoring the structural architecture and biomechanical function of the injured tissue. Therefore, regenerative therapy field in veterinary medicine continues to evolve rapidly both experimentally and clinically. As the field of regenerative therapy continues to advance, equine practitioners need contemporary information regarding the choice of regenerative biologic type and recommendations regarding clinical implementation of regenerative therapies. Meanwhile, clinicians must also be aware of the limitation in the available knowledge regarding regenerative therapy and the impending regulatory laws that may limit its use in clinical joint diseases in equine. Although, preliminary data generated from clinical trials in human patients and experimental studies in equine osteoarthritis are encouraging, preliminary data have been published about very limited clinical application of regenerative therapies in horses suffering from clinical joint disease and the commercialization of these treatments may be premature. Additional studies are needed to determine the optimum conditions for harvest, culture and expansion of these biologics, appropriate dosing, optimal delivery method, short and long term safety. This review describes the three main biologics used for regenerative therapy, namely; stem cells, Platelet Rich Plasma (PRP) and Autologous Conditioned Serum (ACS) and draws together research findings from in vitro and in vivo studies to give an overview of current regenerative therapies for treatment of osteoarthritis in equine.

Keywords: Autologous Conditioned Serum; Horse; Osteoarthritis; Platelet Rich Plasma; Regenerative Therapy; Stem Cells.

577. Impact of Dimethyl Sulfoxide (DMSO) Combined with Corticosteroid on Repair of Fractures of the Proximal Phalanx in 14 Horses

Mohamed B. Mostafa, Ashraf M. Abu-Seida and Ahmed I. Abdelgalil

This study evaluates the impact of fetlock intra-articular and digital flexor tendon sheaths intra-synovial injections of dimethyl sulfoxide (DMSO) combined with corticosteroid as conservative treatment of mid-sagittal fractures of the proximal phalanx (P1) in horses. Fourteen horses with radiographically confirmed mid-sagittal fractures of P1 were recruited for this study. These horses were treated with fetlock intra-articular and digital flexor tendon sheaths intra-synovial injections of 5 mL of 20% dimethyl sulfoxide combined with 100 mg hydrocortisone sodium succinate. Fiberglass cast was applied from the carpal joint and down to the hoof. Intravenous phenylbutazone was injected at a dose of 4.4 mg kgG1 for one week. The animal was kept for box confinement for 3-8 weeks. Lameness re-examination and follow up radiographs were performed for each horse after 1, 2 and 3 months of treatment. All data were expressed as mean and standard deviation. Horses with short and long incomplete mid-sagittal fractures showed clinical improvement in lameness after 10±1.5 and 18±3 days of treatment and returned to work after 33±2.5 and 55±5.5 days of treatment. Out of four horses with

complete mid-sagittal fracture, three animals showed clinical improvement in lameness and recovery after 35±4.7 and 85±4.5 days of treatment. In conclusions, conservative treatment including; fetlock intra-articular and intra-synovial of deep digital flexor tendon sheaths injection of DMSO combined with corticosteroid, fiberglass cast and box confinement can reduce the healing time and minimize the degenerative joint changes and healing callus in both incomplete and complete mid-sagittal fractures of the proximal phalanx in horses.

Keywords: DMSO; Horses; Hydrocortisone; Proximal phalanx; Mid-Sagittal Fracture.

578. Studies on Sharp Foreign Body Syndrome in Iraqi Buffaloes and its Impact on Milk Production

Ashraf M. Abu-Seida and Oday S. Al-Abbadi

Foreign body syndrome of bovine is still a challenge in veterinary practices all over the world. A total of 1536 buffaloes at Nineveh province, Iraq were examined for foreign body syndrome during two years. Based on case history, clinical examination and ferroscopy, foreign body syndrome was initially suspected and subsequently confirmed through rumenotomy in 338 animals and post mortem examination in 13 buffaloes. Morning, evening and daily milk yields (Liters) before and after the onset of Sharp Foreign Body Syndrome (SFBS) was recorded. Data were displayed and analyzed statistically. Out of 1536 examined buffaloes, 351 buffaloes (22.9%) had foreign body syndrome. The most common clinical signs were varying degrees of anorexia, recurrent rumen tympany and decreased milk yield. The mean morning, evening and daily milk yields before SFBS were 2.9±0.2, 2.6±0.2 and 5.5±0.4 and after SFBS were 0.9±0.1, 0.689±0.1 and 1.58±0.2, respectively. Rumenotomy revealed either sharp foreign bodies, both sharp and blunt foreign bodies or blunt foreign bodies in 259 (76.6%), 70 (20.7%) and 9 (2.7%) buffaloes, respectively. The recorded complications in the examined buffaloes were local reticuloperitonitis (n = 231, 65.8%), reticular abscess (n=69,19.7%), diffuse reticuloperitonitis (n=20,5.7%), traumatic pericarditis (n = 13, 3.7%), diaphragmatic hernia (n = 6, 1.7%), splenic abscess (n = 3, 0.8%) and absence of complications (n = 9, 2.6%). In conclusion, sharp foreign body syndrome is a common disease in Iraqi buffaloes causing high economic losses and consequently an urgent need for a science based policy is required to control and manage this syndrome.

Keywords: Buffaloes; Milk; Rumenotomy; Sharp foreign body Syndrome; Traumatic pericarditis; Traumatic reticuloperitonitis.

579. Evaluation of Limb Conformation in Jumping Thoroughbred Horses

Nasser A. Senna, Mohamed B. Mostafa, Ashraf M. Abu-Seida and Yahya M. Elemmawy

Little data are available in the normal range of conformation traits in jumping thoroughbred horses. The aim of this study was to characterize objectively baseline measurements of lengths and angles in fifty-one jumping thoroughbred horses using tape meter and a computer-aided design program (AutoCAD, 2013). An objective photographic method of evaluating conformation was

used. All data were analyzed statistically. The results of the present study revealed that the mean lengths of neck, back and breast width were 100.69±5.6, 92.47±5.66 and 51.2±5.6 cm, respectively. The mean lengths of shoulder, arm, forearm and fore cannon were 69±5, 34±2.9, 46±2.4 and 28.67±2.3 cm, respectively. The back length represented 91.8% of neck length and the arm length represented 49.7% of the shoulder length. The fore cannon length represented 62.3% of the forearm length and the forearm length represented 66.6% of the shoulder length. The fore cannon length represented 41% of the shoulder. The mean lengths of pelvis, thigh, gaskin and hind canon were 51.39±5.12, 49.66±5.12, 53.09±4.8 and 37.44±3.67 cm, respectively. The pelvis, thigh and gaskin lengths were nearly equal. The hind cannon length represented nearly 70% of the lengths of pelvis, thigh and gaskin length. The fore cannon was 25% shorter than the hind cannon. In lateral view, the mean shoulder, elbow, carpus and fore fetlock joint angles were 99±3.74°, 138.37±4.7°, 177.7±2.32° and 142.73±6°, respectively. The mean croup, hip, stifle, hock and hind fetlock angles were 144.63±4.8°, 89±8.34°, 114.94±13°, 148.59±5.3° and 149.84±8°, respectively. In dorsal view, the mean right and left shoulder, elbow, carpus and fore fetlock joint angles were 74.31±3°, 168.27±4°, 176.47±2.4° and 173.53±4.8°, respectively. In conclusion, the obtained results provide guidelines for establishing database for selection jumping thoroughbred with better athletic performance.

Keywords: Conformation; Joints; Jumping; Limb; Thoroughbred horses.

580. Histologic Evaluation of Furcation Perforation Treated with Mineral Trioxide Aggregate and Bioaggregate

Ehab E. Hassanien, Ashraf M. Abu-Seida, Ahmed A. Hashem and Salah S. Khanbash

Asian Journal of Animal Sciences, 9: 148-156 (2015)

The aim of this work was to evaluate the healing of furcation perforation following treatment with Mineral Trioxide Aggregate (MTA) and BioAggregate by histologic examination. The present study was carried out on a total of 72 premolar teeth from 6 adult mongrel dogs. Under general anesthesia, furcation perforation was carried out by using a round bur # 4. The access cavity of all experimental and positive control teeth was left open for 4 weeks. The teeth were classified according to the observation period into three groups; I (one week), II (one month) and III (3 months) (2 dogs each). Each group was further subdivided into three subgroups according to the treatment protocol. These subgroups included; subgroup a (MTA), subgroup b (BioAggregate) and subgroup c (positive control). Inflammatory cell count, epithelial proliferation and new hard tissue formation were assessed. Statistical analysis of the results was carried out and significance of the parameters was determined in the tests at p<0.05. The statistical analysis revealed that MTA and BioAggregate had a similar biological response on the periodontal tissue. There was no significant difference in inflammatory cell count, epithelial proliferation and new hard tissue formation between MTA and BioAggregate subgroups. In conclusion, both MTA and Bioaggregate show similar biological responses when used as a perforation repair material in dogs. These responses showed improved healing characteristics when compared to the control.

Keywords: Bioaggregate; Dogs; Furcation perforation; Hard tissue; Mineral Trioxide Aggregate.

581. Congenital Cutaneous Squamous Cell Carcinoma in A Lamb

Ashraf M . Abu-Seida

Asian Journal of Animal Sciences, 9: 80-84 (2015)

Cutaneous squamous cell carcinoma is of great economic importance in sheep producing countries. The present report records-for the first time-a case of congenital cutaneous squamous cell carcinoma in a 10-day-old male lamb. The neoplasm appeared as an ulcerated, blackish tumor of bad odor at the left supra-orbital area. The sub-mandibular and pre-scapular lymph nodes were swollen. Corneal opacity and purulent ocular discharge were also observed in the related eye. Cut section of the neoplasm revealed reddish white, fleshy moist surface with ulcerated blackish overlying layer. Microscopically, the neoplasm had numerous keratin pearls, extensive fibrous stroma and leucocytic cell infiltration mainly neutrophils and lymphocytes. The neoplastic cells showed mitotic figures. Surgical excision of the neoplasm under local infiltration analgesia was curative without recurrence. In conclusion, ovine cutaneous squamous cell carcinoma may occur as a congenital affection.

Keywords: Congenital; Lamb; Sheep; Skin; Squamous Cell Carcinoma.

582. Hemimelia with Calcaneal Subluxation in A Buffalo Calf: A Case Report and Review of Literature

A.M. Abu-Seida, M.B. Mostafa and O.S. Al-Abbadi

Asian Journal of Animal Sciences, 9: 162-166 (2015)

This report presents a rare case of hemimelia with anterolateral calcaneal subluxation in a buffalo calf. The malformed calf was born from underfed dam which was naturally inseminated by unrelated bull. Neither the parents nor offsprings of the dam had hemimelia. The right malformed limb ended at hock joint and had two fused rudimentary claws and declaws. The malformed hock joint was immovable in both active and passive movements and had nearly straight angle. Achilles tendon deviated laterally. Radiographic findings included complete absence of all structures distal to the right hock joint, small tibia and tarsal bones and anterolateral subluxated calcaneus.

Keywords: Buffalo; Calcaneus; Calf; Hemimelia; Subluxation.

583. The Efficacy of Cryopreserved Amniotic Membrane Seeded with Mesenchymal Stem Cells for Management of Bone Defect in A Canine Model

Mohammed Said Amer, Ashraf Ali Shamaa, Dina Sabry Abdel Fatah,Gehan Gamil Shehab, Ayman Abdelmonem Mostafa and Ibrahim Abdallah Emam

Research Journal of Pharmaceutical, Biological and Chemical Sciences, 6(3): 1620-1631 (2015)

Bone substitutes and scaffolds play continually progressing role in management of bone defects. The amniotic membrane (AM) has been used in surgical transplantation as a biomaterial and scaffold. Autologous mesenchymal stem cells (MSCs) represent an excellent source for tissue engineering for the low risk of immune complications.The present study was planned into 2 main stages. The first stage, AM bank was prepared from 10 full term

pregnant female-dogs. Prepared AMs were preserved at -80°C and later were used as a scaffold. The second stage, experimental bone defect was carried out on 27 apparently healthy mongrel dogs. Dogs were divided into 3 main groups; Group A: control group; defect left without scaffold. Group B: received AM only and Group C: received AM seeded with MSCs. The animals in each group were divided into 3 sub-groups (n=3) according to follow up periods as 6, 12 and 24 weeks. Animals of group C were used for MSCs acquisition and preparation. Under complete aseptic condition; the prepared AM was co-cultured with MSCs. The animals were observed for clinical, radiological and morphohistological examinations. The results showed that the use of AM seeded with MSCs has good promising outcome in bone defect healing than AM alone

Keywords: Cryopreserved; Amniotic membrane; Mesenchymal; Stem; Defect; Dog.

584. Successful Practice of Electroacupuncture Analgesia in Equine Surgery

Eldessouky Sheta, Safwat Ragab, Haithem Farghali and Asmaa EL-Sherif

Electroacupuncture analgesia was used for surgery in horses and donkeys. A KWD-808 electrical stimulator was used to incrementally induce a dense, dispersed wave output at frequencies from 20 to 55 Hz, which was maintained at a frequency of 55 Hz, and to change the amplitude of the wave to the best grading number for the suggested operation in each animal. Induction of analgesia lasted for 20e30 minutes, and the effect of analgesia was maintained for 20e45 minutes depending on the type of surgery performed. The exhibited clinical signs, physical examination data, and the responses of all animals were used for evaluating the periods of analgesia. Although the majority of the cases (95%) had no response to strong surgical pain, they experienced significant increases in heart rates and respiratory rates during induction. The lack of pain, relaxed surgical procedures, reduced intraoperative bleeding, and improved healing without complications were all definite benefits of using electroacupuncture analgesia in surgery. Thus, this study has provided surgical evidence supporting the effectiveness of electroacupuncture analgesia, as well as confirming its reliability, in the field of equine anesthesia and surgery.

Keywords: Acupoints; Acupuncture; Analgesia; Electroacupuncture; Equine surgery.

585. Prevalence of Common Canine Digestive Problems Compared with other Health Problems in Teaching Veterinary Hospital, Faculty of Veterinary Medicine, Cairo University, Egypt

Gamal M. H. Rakha, Mounir M. Abdl-Haleem, Haithem A. M. Farghali and Hitham Abdel-Saeed

Aim :problems among dogs that were admitted to the teaching veterinary hospital, faculty of veterinary medicine, Cairo University, Egypt during 1 year period from January to December 2013. Also, study the effect of age, sex, breeds, and season on the distribution of digestive problems in dogs.

Materials and Methods: A total of 3864 dogs included 1488 apparently healthy (included 816 males and 672 females) and 2376 diseased dogs (included 1542 males and 834 females) were registered for age, sex, breed, and the main complaint from their owners. A complete history and detailed clinical examination of each case were applied to the aids of radiographic, ultrasonographic, and endoscopic examination tools. Fecal examination was applied for each admitted case. Rapid tests for parvovirus and canine distemper virus detection were also performed.

Results: A five digestive problems were commonly recorded including vomiting, diarrhea, concurrent vomiting with diarrhea, anorexia, and constipation with a prevalence (%) of 13.6, 19.1, 10.1, 13.1, and 0.5 respectively while that of dermatological, respiratory, urinary, neurological, cardiovascular, auditory, and ocular problems was 27.9, 10.5, 3.3, 0.84, 0.4, 0.25, and 0.17 (%) respectively. This prevalence was obtained on the basis of the diseased cases. Age and breed had a significant effect on the distribution of digestive problems in dogs (p<0.001). Gender had an effect on the distribution of digestive problems with significant (p=0.01) while season had a non-significant effect (p>0.05) on the distribution of such problems.

Conclusion: Digestive problems were the highest recorded problems among dogs, and this was the first records for such problems among dogs in Egypt. Age, gender, and breeds had a significant effect on the distribution of the digestive problems in dogs while season had a non-significant effect on the distribution of such problems. The present data enable veterinarians in Egypt to ascertain their needs for diagnostic tools and medication that must be present at any pet clinic.

Keywords: Canine; Causes; Digestive problems; Egypt; Prevalence.

586. Using of Chitosan Scaffold Seeded with Autologous Undifferentiated Mesenchymal Stem Cells for Femoral Bone Defect Management in Dogs

Ahmed Syed Soliman, Mohammed Said Amer, Ashraf Ali Shamaa,Dina Sabry Abdelfatah, Gehan Gamil Shehab, Ayman Abdelmonem Mostafa and Omaima Hagag Darwish

Twenty seven apparently healthy mongrel dogs (2-5yeays old) weighing (15-20Kg) were divided into three groups (n=9). Group A; control group in which no implant was used to fill the bone defect in the transected femur of the operated limb. Group B; in which Chitosan without MSCs was used as a bone scaffold to fill the bone defect in the transected femur.

Group C; in which Chitosan with MSCs was used to fill the bone defect of the transected femur. Each group was subdivided into three sub-groups (n=3) according to the time of postoperative observation (1½, 3 and 6 months). The dogs were checked clinically and radiologically till the end of the study designed. After euthanasia, the femurs of the operated limb were examined histologically. The results showed that, using Chitosan as a bone scaffold seeded with MSCs enhanced the process of bone healing than using of Chitosan alone.

Keywords: Bone; Chitosan; Defect; Femoral; Mesenchymal; Stem.

Dept. of Virology

587. Development of Reverse Transcription Recombinase Polymerase Amplification Assay for Avian Influenza H5N1 Ha Gene Detection

Nahed Yehia, Abdel-Satar Arafa, Ahmed Abd El Wahed, Ahmed A. El-Sanousi,Manfred Weidmann and Mohamed A. Shalaby

The 2006 outbreaks of H5N1 avian influenza in Egypt interrupted poultry production and caused staggering economic damage. In addition, H5N1 avian influenza viruses represent a significant threat to public health. Therefore, the rapid detection of H5 viruses is very important in order to control the disease. In this study, a qualitative reverse transcription recombinase polymerase amplification (RT-RPA) assay for the detection of hemagglutinin gene of H5 subtype influenza viruses was developed. The results were compared to the real-time reverse transcription polymerase chain reaction (RT-PCR). An in vitro transcribed RNA standard of 970 nucleotides of the hemagglutinin gene was developed and used to determine the assay sensitivity. The developed H5 RT-RPA assay was able to detect one RNA molecule within 7 min, while in real-time RT-PCR, at least 90 min was required. H5 RT-RPA assay did not detect nucleic acid extracted from H5 negative samples or from other pathogens producing respiratory manifestation in poultry. The clinical performance of the H5 RT-RPA assay was tested in 30 samples collected between 2014 and 2015; the sensitivity of H5 RT-RPA and real-time RT-PCR was 100%. In conclusion, H5 RT-RPA was faster than real-time RT-PCR and easily operable in a portable device. Moreover, it had an equivalent sensitivity and specificity.
Keywords: Avian influenza;Subtype H5N1; Recombinase polymerase amplification assay; Real-Time RT-PCR.

Dept. of Zoonoses

588. Impaired Cell Cycle Regulation in A Natural Equine Model of Asthma

Alicja Pacholewska, Vidhya Jagannathan, Michaela Drögemüller ,Jolanta Klukowska- Rötzler , Simone Lanz , Eman Hamza, EmmanouilT. Dermitzakis, Eliane Marti, Tosso Leeb and Vincent Gerber

Recurrent airway obstruction (RAO) is a common and potentially debilitating lower airway disease in horses, which shares many similarities with human asthma. In susceptible horses RAO exacerbation is caused by environmental allergens and irritants present in hay dust. The objective of this study was the identification of genes and pathways involved in the pathology of RAO by global transcriptome analyses in stimulated peripheral blood mononuclear cells (PBMCs). We performed RNA-seq on PBMCs derived from 40 RAO affected and 45 control horses belonging to three cohorts of Warmblood horses: two halfsib families and one group of unrelated horses. PBMCs were stimulated with hay dust extract, lipopolysaccharides, a recombinant parasite antigen, or left unstimulated. The total dataset consisted of 561 individual samples. We detected significant differences in the expression profiles between RAO and control horses. Differential expression (DE) was most marked upon stimulation with hay dust extract. An important novel finding was a strong upregulation of CXCL13 together with many genes involved in cell cycle regulation in stimulated samples from RAO affected horses, in addition to changes in the expression of several HIF-1 transcription factor target genes. The RAO condition alters systemic changes observed as differential expression profiles of PBMCs. Those changes also depended on the cohort and stimulation of the samples and were dominated by genes involved in immune cell trafficking, development, and cell cycle regulation. Our findings indicate an important role of CXCL13, likely macrophage or Th17 derived, and the cell cycle regulator CDC20 in the immune response in RAO.
Keywords: Horses; Asthma; Immune response; Gene expression; Macrophages; Gene regulation; Cell cycle and Cell division; Equines.

589. Novel Detection of Helicobacter Pylori in Fish: A Possible Public Health Concern

Khaled A. Abdel-Moein, Hossam Saeed and Ahmed Samir

Helicobacter pylori is one of the most common human pathogens worldwide with serious clinical out-comes. Although, H. pylori is a major water-borne pathogen, its occurrence in fish is still unknown. Thisleads us to conduct the current study in order to clarify this point and to investigate the potential role offish in the epidemiology of H. pylori. For this purpose, fecal samples were obtained from 315 fish fromdifferent species and were caught from various aquatic environments at different localities in Egypt. Theobtained fecal samples were examined for the occurrence of H. pylori using monoclonal antibody basedlateral flow immunoassay for antigen detection and after then the positive samples were confirmed byPCR. In addition, fecal samples from 18 fish handlers were also examined for the presence of H. pylori bylateral flow technique. The overall prevalence rates of H. pylori in the examined fish were 6.7% and 1.9%for LF and PCR, respectively, whereas 61.1% of fish handlers were positive. Only tilapia fish showed posi-tive results by both techniques in rates 10.9% and 3.1%, respectively. Interestingly, H. pylori was detectedin cultured and wild tilapia in various aquatic environments at different localities, whereas all other fishspecies were negative even those that were collected from the same water source where positive tilapiawere caught. These results concluded that tilapia fish may be considered as a potential zoonotic reservoirfor H. pylori and thus, H. pylori may become a new fish-borne pathogen. Further studies are needed toinvestigate the occurrence of H. pylori in other fish species.
Keywords: Helicobacter pylori; Fish; Tilapia; Zoonosis.

Basic Science Sector

National Institute of Laser Enhanced Sciences

Dept. of Engineering Applications of Lasers (EAL)

590. Tunable Spatial–spectral Phase Compensation of Type-I (ooe) Hyperentangled Photons

S. F. Hegazy and S. S. A. Obayya

J. Opt. Soc. Am. B, 32(3): 445-450 (2015) IF: 1.97

The two-photon state generated by overlapping the noncollinear spontaneous parametric down conversion (SPDC) emissions of two coherently pumped type-I crystals undergoes spatial and spectral decoherence precluding the capture of high pair counts with high state fidelity. Here we present a tunable compensation method for tackling the rising state decoherence in the two degrees of freedom in the case of crystals with negative birefringence. We determine the directional-spectral phase function of the two-photon state initially and after compensation, taking into account the finite spectral width of the pump beam. Subsequently, the optimal characteristics of the compensation crystals are computed by criteria of flat phase function in spectrum and space. The results of our model are compared with measurements of some recent experiments.

591. Simultaneous Suppression of Time-delay Signature in Intensity and Phase of Dual-channel Chaos Communication

Amr Elsonbaty, Salem F. Hegazy and Salah S. A. Obayya

IEEE Journal of Quantum Electronics, 51 (9) (2015)   IF: 1.887

In this paper, we propose a novel dual-channel optical chaos system with a time-delay (TD) feature simultaneously suppressed in all observables, i.e., in both intensity and phase. A hybrid optical and electro-optic feedback for a single verticalcavity surface-emitting laser (VCSEL) is verified to induce simultaneous TD suppression for the polarization-resolved components of the chaotic output. A comprehensive mathematical model is developed to incorporate the optical and electro-optic time delays into the rate equations of the VCSEL. The suppression of TD signature is then examined by means of autocorrelation function and delayed mutual information. The results show that the output chaotic signal has the TD feature well eliminated in both the intensity and phase over certain regions of parameter space identified using the peak signal to mean ratio technique. The independent evolution of the two orthogonal VCSEL modes renders the polarization-resolved output modes appropriate for the enhanced dual-channel chaos applications. To the best of our knowledge, this is the first time that a dual-channel chaos communication system is reported with simultaneous suppression of the TD feature in all the transmitted observables. Index Terms—Vertical-cavity surface-emitting laser.
Keywords: Vertical-cavity Surface-emitting laser (VCSEL); Optical feedback; Time delay (TD) Suppression; Dual-channel Chaos communication.

592. Hybrid Direct-detection Differential Phase Shift Keying-multipulse Pulse Position Modulation Techniques for Optical Communication Systems

Ahmed E. Morra, Hossam M.H. Shalaby, Salem F. Hegazy and Salah S.A. Obayya

Optics Communications, 357: 86-94 (2015) IF: 1.449

In this paper, a hybrid differential phase shift keying-multipulse pulse position modulation (DPSK–MPPM) technique is proposed in order to enhance the receiver sensitivity of optical communication systems. Both binary and quadrature formats are adopted in the proposed systems. Direct-detection DPSK schemes that are based on an asymmetric Mach–Zehnder interferometer with a novel ultrafast discrete delay unit are presented to simplify the receiver implementation. Expressions for the bit-error rate (BER) of the proposed hybrid modulation techniques are derived taking into account the effect of the optical amplifier noise. Under the constraints of the same transmitted data rate, bandwidth, and average received optical signal-to-noise ratio, the BER performances of the proposed schemes are then evaluated numerically and compared with that of traditional differential binary phase shift keying (DBPSK), differential quadrature phase shift keying (DQPSK), and MPPM schemes and with that of recent hybrid schemes. Furthermore, a comparison between the proposed systems and the traditional ones is held in terms of bandwidth-utilization efficiency. Our results reveal that the proposed hybrid schemes aremore energy-efficient and have higher receiver sensitivity compared with the traditional ones while improving the bandwidth-utilization efficiency. The proposed DPSK–MPPM system is ready to accommodate adjustable (or variable) bit rates, by virtue of the programmable delay integrated to the receiver system.
Keywords: DD-DBPSK; DD-DQPSK; MPPM; Optical amplifier noise limited systems.

593. Analysis of Ultra-high Birefringent Fully-Anisotropic Photonic Crystal Fiber

Rasha A. Hussein, Mohamed Farhat O. Hameed, Jala El-Azab, Wessameldin S. Abdelaziz and S. S. A. Obayya

Optical and Quantum Electronics, 47: 2993-3007 (2015) IF: 0.987

Highly birefringent photonic crystal fiber (PCF) is proposed and analyzed using full vectorial finite element method. The reported design has a central large core filled with nematic liquid crystal (NLC) which provides tunability with the external electric field and temperature. In addition, the full permittivity tensor of the NLC material is taken into account when we study the modal properties of the proposed PCF. The effects of the geometrical parameters, rotation angle of the director of the NLC, and temperature on the modal properties of the reported design are investigated. The suggested design offers high birefringence of 0.191 at the operating wavelength of 1.55 lm with NLC diameter of 3.4 lm with low losses of the two polarized modes. As the NLC diameter decreases to 1.0 lm, high birefringence of 0.08 is obtained with single mode NLC PCF design, which is significantly large birefringence to maintain polarization state
Keywords: Photonic crystal fibers; Nematic liquid crystal finite element method birefringence.

Dept. of Laser Applications in Metrology, Photochemistry and Agriculture (LAMPA)

594. Photostability of Gold Nanoparticles with Different Shapes: the Role of Ag Clusters

Yasser A. Attia, David Buceta, Félix G. Requejo, Lisandro J. Giovanettid and M. Arturo López-Quintela

Anisotropic gold nanostructures prepared by the seed method in the presence of Ag ions have been used to study their photostability to low-power UV irradiation (254 nm) at room temperature. It has been observed that, whereas spheres are very stable to photoirradiation, rods and prisms suffer from photocorrosion and finally dissolve completely with the production of Au(III) ions. Interpretation of these differences is based on the presence of semiconductor-like Ag clusters, adsorbed onto rods and prisms, able to photocorrode the Au nanoparticles, which are absent in the case of Au spheres. We further show direct evidence of the presence of Ag clusters in Au nanorods by XANES. These results confirm a previous hypothesis (J. Am. Chem. Soc., 2014, 136, 1182–1185) about the major influence of very stable small Ag clusters, not only on the anisotropic formation of nanostructures but also on their photostability.
Keywords: Photocorrosion; Nanoclusters; Anisotropic gold Nanoparticles; Photostability; Silver clusters.

595. Transformation of Gold Nanorods in Liquid Media Induced by nIR, Visible and UV Laser Irradiation

Yasser A. Attia, M. Teresa Flores-Arias, Daniel Nieto, Carlos Vázquez-Vázquez, Germán F. De La Fuente and M. Arturo López-Quintela

Gold nanorods (GNRs) were initially prepared with three different aspect ratios (2.5, 2.9, and 3.8) via a seed-mediated chemical route, using cetyltrimethylammonium bromide (CTAB) as the organic surfactant. These rods were then irradiated under continuous-wave (λ= 1064 nm) and pulsed (λ= 1064, 532, 355 nm) emission modes using Nd:YVO$_4$ and Nd:YAG lasers, respectively. The photostability and behavior of the Au nanorods under these laser irradiation conditions were studied using UV–vis – nIR spectroscopy and electron microscopy. Photofragmentation and melting mechanisms were provoked as a function of laser irradiation parameters (emission mode and wavelength) and caused the GNRs to undergo considerable morphological changes. Important differences were observed between the wavelengths used for irradiation, indicating significantly different nanorod breakdown mechanisms.
Keywords: Gold nanorods; Nanosecond laser; Pulsed laser; Photostability.

596. Hybrid Magnetic-plasmonic Nanocomposite: Embedding Cobalt Clusters in Gold Nanorods

A. N. Emam, M. B. Mohamed, E. Girgisae and K. V. Raof

We developed a method to fabricate hybrid magnetic–plasmonic nanorods (Au–Co NRs) via a modified seed mediated method. The only modification is to use cobalt ions instead of Au3+ in the preparation of the seed solution to obtain gold nanorods doped with Co clusters. By adjusting the amount of cobalt seed solution, Au–Co NRs of controlled aspect ratio can be obtained. The optical properties of the obtained Au–Co NRs were investigated and compared to those of the pure Au NRs. A slight shift and broadening were observed in the alloys compared to the pure ones, which was attributed to the presence of Co clusters leading to suppression of the dielectric properties. High resolution transmission electron microscopy (HRTEM) images indicate the existence of Co clusters in situ in the Au NR host and clearly show the metal–metal interface. The magnetic properties of the obtained Au–Co NRs increase as the concentration of dopant Co cluster seeds increases, as investigated by vibrating sample magnetometry (VSM). Our approach allows us to design nanomaterials of controlled shape, optical and magnetic properties which have many promising applications in tharanostics and photoelectronics.
Keywords: Gold nanorods; Cobalt; Gold nanoalloys; Magneto-plasmonic; Hybrid nanocomposites.

597. Phytosynthesis of Silver–reduced Graphene Oxide (AG-RGO) Nanocomposite with an Enhanced Antibacterial Effect Using Potamogeton Pectinatus Extract

Mohammed Sedki, Mona B. Mohamed, Manal Fawzy, Dalia A. Abdelrehimb and Mohamed M. S. A. Abdel-Mottaleb

A new green synthesis method for the preparation of a silver–reduced graphene oxide (Ag–RGO) nanocomposite using Potamogeton pectinatus (Po) plant extract is introduced. The size, morphology and crystallinity of the as-prepared nanomaterials were studied with an explanation for the role of Po in the synthesis. A preliminary antibacterial experiment was developed to ensure the enhanced antibacterial effect of the Ag–RGO nanocomposite. The antibacterial measurements were done using the colony counting method. The results indicated that the majority of the silver nanoparticles "AgNPs" were formed in a spherical shape with small sizes ranging from 11 to 20 nm. IR spectroscopy results indicated the role of amine and hydroxyl groups from Po in the reduction and capping processes. The preliminary antibacterial examination ensured the enhanced antibacterial effect of the Ag–RGO nanocomposite.
Keywords: Silver nanoparticles; Silver; Reduced graphene Oxide; Nanocomposites; Potamogeton pectinatus.

598. Effect of Laser Wavelength on the Correlation Between Plasma Temperature and Surface Hardness of Fe-V-C Metallic Alloys

S. Messaoud Aberkane, A. Bendibb, K. Yahiaoui, S. Abdelli-Messaci, S.E. Amara and M.A. Harith

We investigated the effect of the excitation laser wavelength in laser induced breakdown spectroscopy (LIBS) on the correlation

between the generated plasma temperature and the mechanical surface hardness of Fe-V18%-C1% alloys. The dependence of the choice of gate width and delay time in the LIBS measurements on the excitation wavelength was discussed. We demonstrated the feasibility of hardness monitoring using the linear relationship between the plasma temperature and Vickers test at three laser wavelengths 1064, 532 and 355 nm. The sensitivity of this approach has been discussed for all cases. The experimental results show that the first harmonic is more appropriate for such application. The crater depth was significantly higher in case of using UV laser compared with the IR, as has been seen using the profilometer. This revealed that surface hardness measurement using LIBS is more efficient (less destructive) by adopting the IR wavelength than the UV for the excitation laser. Effect of laser Wavelength on the Correlation between Plasma Temperature and Surface Hardness of Fe-V-C Metallic Alloys. Available from:
Keywords: Laser; Wavelength; Surface; Libs.

599. Discriminating Crude Oil Grades Using Laser-induced Breakdown Spectroscopy

A. El-Hussein, A.Marzouk and M.A. Harith

Spectrochimica Acta - Part B Atomic Spectroscopy, 113: 93-99 (2015) IF: 3.176

The analysis of crude oil using laser-based analytical techniques such as laser- induced breakdown spectroscopy (LIBS) has become of great interest to various specialists in different fields such as geology, petro-chemistry and environmental science. In this work, a detailed study is presented wherein the implementation of an efficient and simple LIBS technique to identify the elemental constituents of crude oil and to distinguish between different grades of petroleum crude oil is discussed. Laser-induced plasma (LIP) technique has been used in this work for direct measurements of atomic, ionic and molecular species in dry crude oil samples with API gravities ranging between 18 and 36. The technique was implemented using the first harmonic of a pulsed Nd-YAG laser source. Atomic and molecular emission bands were observed, consisting of characteristic spectral lines of atoms and diatomic molecular bands, namely from C, H, Si, Na, Ca, Mg, AL, Fe, Ti, Mo, C_2 and CN. The intensities of high-resolution spectral lines for some atoms and molecules of elements such as Ca, Na, Fe, Mo, C_2 and CN were evaluated at different wavelengths along the obtained spectra. The molecular bands and the elemental spectral lines were used to assess the possibility of adopting the LIBS technique in differentiating between crude oil samples with different American Petroleum Institute (API) gravity values. The results indicate the presence of a distinct correlation between the API gravity values of the various oil samples and the spectral line intensities of the elements and some molecular radical constituents. In addition, the possibility of identifying the API gravity values of unknown oil samples is also indicated.
Keywords: LIBS; Crude petroleum; API (American Petroleum Institute) gravity; Chlorinated solvent.

600. Laser Researches on Livestock Semen and Oocytes: A Brief Review

Z. Abdel-Salam and M.A. Harith

Journal of Advanced Research, 6: 311-317 (2015) IF: 3

This article presents a brief review of the past and present literature pertinent to laser effects on sperm motility parameters, improvement of oocyte maturation and characterization of semen in livestock. The aim was, on one hand, to make the readers aware of such knowledge and on the other hand to trigger the interest of the animal reproduction scientific community in attempting some laser techniques that have not yet been fully exploited in the field of artificial insemination. With respect to the conventional methods, laser is a more sensitive and less costly technology that can be used for improving artificial insemination and embryo production system. Since 1980s, laser treatment came on the biological samples scene; its applications have continuously been developed thereafter. Exploitation of laser light by various researchers for improving the reproductive efficiency of sperm cells and the maturation rate in different livestock is
Keywords: Semen; Laser; Spectroscopy; Oocyte.

601. Comparative Study Between the Photodynamic Ability of Gold and Silver Nanoparticles in Mediating Cell Death in Breast and Lung Cancer Cell Lines

Ahmed El-Hussein, Ivan Mfouo-Tynga, Mohamed Abdel-Harith and Heidi Abrahamse

Journal of Photochemistry and Photobiology B: Biology, 153: 67-75 (2015) IF: 2.96

Cancer is one of the dreadest diseases once diagnosed and has severe impacts on health, social and economic global aspects. Nanomedicine is considered an emerging approach for early cancer diagnosis and treatment. The multifunctional effects of silver and gold nanoparticles (Ag and Au NPs) have rendered them to be potent candidates for biomedical applications. The current work presents a comparative study between Au NPs and Ag NPs as possible potent photosensitizers (PS) in photodynamic therapy (PDT). Transmission electron microscopy (TEM) was used to identify and characterize the shape, size, and cellular localization of Au NPs; the absorption properties of Au NPs were determined using ultraviolet–visible spectroscopy (UV–Vis) and zeta potential was used to identify surface charge. Inverted light microscopy (LM), Trypan blue exclusion assay, adenosine triphosphate luminescence (ATP), and lactate dehydrogenase membrane integrity assays (LDH) were used for investigating the photodynamic ability of these nanostructures on breast (MCF-7) and lung (A549) cancer cell lines. Flow cytometry using Annexin V and propidium iodide (PI) dyes was used to determine the cell death pathway induced. The average size of the synthesized Au NPs was 50 nm, having an absorption peak at 540 nm with -7.85 mV surface net charge. MCF-7 and A549 cells were able to absorb the Au NPs. The latter, when irradiated with laser light in the phototherapeutic window, promoted cytotoxicity and a significant reduction in cell viability and proliferation were observed. The photodynamic activity that was observed in both cancer cell lines was found to be less eminent than that observed in case of the Ag NPs when compared to Au NPs. The present study is the first that compares the photodynamic ability of two different nanoparticles, silver and gold, as photosensitizers without any further functionalization. This study extends the possibilities of using such nanostructures in PDT within the therapeutic window wavelength, yet through the conjugation of Au NPs with other photosensitizers to synergize its effect.

Keywords: Nanotechnology; Gold nanoparticles cell damage breast cancer; Lung cancer; Silver nanoparticles electron microscopy.

602. Spectroscopic Characterization of Magnetic Fe₃O₄@ Au Core Shell Nanoparticles

Dina M. Fouad, Waleed A. El-Said and Mona B. Mohame

The magnetic nanoparticles iron oxide (Fe_3O_4) nanoparticles and iron oxide/gold core–shell (Fe_3O_4/Au) nanoparticles were synthesized and their catalytic photo-degradation activity towards malathion as example of organophosphorus pesticides were reported. Iron oxide (Fe_3O_4) magnetic nanoparticle was successfully prepared through co-precipitation method by the reduction of ferric chloride ($FeCl_3$) using ascorbic acid. The morphology of the prepared nanoparticles was characterized by the TEM and XRD (X-ray diffraction) techniques. Degradation of 10 ppm of malathion in the presence of these nanoparticles under UV radiation was monitored using (HPLC) and UV–visible spectra. Fe_3O_4/Au nanoparticles showed higher efficiency in photo-degradation of malathion than Fe_3O_4 ones.
Keywords: Nanostructures; Magnetic properties; Electron microscopy.

603. Hybrid Magnetic-semiconductor Nanocomposites: Optical, Magnetic and Nanosecond Dynamical Properties

A.N. Emam, E. Girgis, A.A. Mostafa, O.W. Guirguis and M.B. Mohamed

A series of colloidal CdSe quantum dots doped with different concentration of cobalt ions has been prepared via organometallic pyrolysis of a mixture of cadmium stearate and cobalt dithiocarbazate. The conditions required for successful doping depend on the source of cobalt ions and the dopant concentration. The structure and morphology of the prepared nanocrystals have been characterized using X-Ray Diffraction (XRD), and Transmission Electron Microscope (TEM). Slight shift in the interplaner space was observed in the XRD pattern of the doped nanocrystals. Formation of separate cobalt nanoclusters has been observed in the TEM images upon increasing the cobalt concentration more than 2% of the original cadmium concentration. This was confirmed by magnetic measurements of the prepared samples. Room-temperature ferromagnetism has been observed, in which the switching field increases as the cobalt ratio increases. Increasing the cobalt ratio more than 5% increases the coercivity due to formation of Co0 nanoclusters. Moreover, the presence of localized magnetic ions in semiconductor QDs leads to strong exchange interactions between sp band electrons and the magnetic ions d electrons. This would influence the optical properties such as absorption, emission, as well as nanosecond relaxation dynamics.
Keywords: Nanostructures; Semiconductor; Magnetic properties; Heterostuctures; Optical properties.

604. In Vitro Cytotoxicity and Genotoxicity Studies of Gold Nanoparticles-mediated Photo-thermal Therapy Versus 5- Fluorouracil

Iman E. Gomaa, Sara A. Abdel Gaber, Samarth Bhatt, Thomas Liehr, Michael Glei,Tarek A. El-Tayeb and Mahmoud H. Abdel-Kader

This study evaluates tumour cell - killing efficacy of metallic gold nanoparticles (AuNPs) - mediated photo-thermal therapy (PTT) in comparison to 5 - fluorouracil (5-FU) as a standard chemotherapeutic drug . It also focuses on the possible genetic abnormalities of both drugs in normal blood lymphocytes. Both 5-FU and light-activated spherical AuNPs of 15± nm diameter were used to target MCF-7 breast cancer cell line. Alkaline comet assay, standard karyotyping and multiplex fluorescent in situ hybridization were applied in order to investigate the respective possible genotoxic and mutagenic side effects that might result from the application of each therapeutic modality. Results showed that the LC25 of AuNPsmediated PTT was achieved at a concentration of 100 lM for 12-h incubation and exposure to light energy of 50 J/cm², while the same cytotoxic effect was obtained by incubating the MCF-7 cells with the same concentration of the chemotherapeutic drug 5-FU for 24 h. On the other hand, AuNPs showed insignificant genotoxic effect of DNA damage represented by 4.6 % in comparison to 18.58 % exerted by 5-FU. The chromosomal studies resulted in normal karyotypes for cells treatedwithAuNPs-mediated PTT,while those treated with 5-FU showed several types of numerical as well as structural chromosomal aberrations. In conclusion, compared to 5-FU, light-activated AuNPs-mediated PTTprovides considerable efficacy in breast cancer cells killing with no genetic side effects under the proposed experimental conditions.
Keywords: Photo-thermal therapy; Breast cancer; Genotoxicity; Mutagenicity; Environmental and health effects.

605. Study of the Optical Properties of Solid Tissue Phantoms Using Single and Double Integrating Sphere Systems

S. Monem, A. Singh, A. E. Karsten, R. Amin and M. A. Harith

Tissue simulators, the so-called tissue phantoms, have been used to mimic human tissue for spectroscopic applications. Phantoms' design depends on patterning the optical properties, namely absorption and scattering coefficients which characterize light propagation mechanisms inside the tissues. In this work, two calibration models based on measurements adopting integrating sphere systems have been used to determine the optical properties of the studied solid phantoms. Integrating sphere measurement results were fed into the calibration models using the multiple polynomial regression method and Newton– Raphson algorithm. The third-order polynomials have been used for optical properties predictions. Good agreement between the two models has been obtained. Role of solid phantoms' components, namely titanium dioxide as a scatterer and black carbon as an absorber, has been discussed. Both of the two components showed observable effects on the absorption and scattering of light inside the solid tissue phantoms.
Keywords: Laser; Phantoms; Tissue.

Basic Science Sector

606. Wavelength Dependence of Laser Induced Breakdown Spectroscopy (LIBS) on Questioned Document Investigation

Nany Elsherbiny and Aied Nassef

The fast and nearly non-destructive criteria of laser induced breakdown spectroscopy (LIBS) technique has been exploited for forensic purposes, specifically, document investigation. The dependence of the optical emission spectra of different black gel ink samples on the excitation laser wavelength, namely the visible wavelength at λ = 532 nm and the IR wavelength at λ = 1064 nm, was studied. The inks of thirty black gel-ink pens comprising ten brands were analyzed to determine the variation of the chemical composition of ink and to discriminate among them with minimum mass removal and minimum damage to the document's paper. Under the adopted experimental conditions, the ability of the visible LIBS to differentiate among the different ink samples was successful compared to IR LIBS at the same laser pulse energy (~ 25 mJ/pulse, laser fluence is ~ 1400 J·cm^{-2} for visible laser and ~ 1100 J·cm^{-2} for IR laser) which could be attributed to the IR absorption effects by the black ink. However, the visible LIBS produces deeper crater with respect to that produced by IR LIBS. Applying IR LIBS with higher pulse energy of ~ 87 mJ (laser fluence is ~ 4100 J·cm^{-2}), identification and differentiation of the adopted samples was performed with producing a larger-diameter but superficial crater. The plasma parameters are discussed at the adopted experimental conditions. The results support the potential of LIBS technique using both the visible and IR lasers to be commercially developed for forensic document examination.

Keywords: Laser induced breakdown spectroscopy (LIBS); Forensic; Document investigation; Black ink.

607. Surface Heterogeneity Study of Some Reference Cu-Ag Alloys Using Laser-Induced Breakdown Spectroscopy

S. A. Sheta, G. Di Carlo, G. M. Ingo and M. A. Harith

Investigation of the chemical composition, surface structure, metallurgical features, corrosion mechanism, and surface modification techniques of archeological metallic artifacts from Romans and pre-Roman times aimed to simulate the most commonly used Cu-based and Ag-based alloys. These simulated reference alloys will be used as sacrificial materials to study the most appropriate conservation materials and procedures. In the present work, laser-induced breakdown spectroscopy (LIBS) is introduced as a new validated surface mapping technique to study the micro-chemical distribution of elements in binary reference copper–silver alloy samples. Using different techniques for surface and bulk analysis, such as SEM coupled with energy-dispersive X-ray spectroscopy and X-ray diffraction, it has been proven that LIBS is a simple, sensitive, and direct technique in the determination of heterogeneity of the sample's surface. By changing the laser wavelength (λ/nm) and focal length of the used focusing lens (f/cm), different spot sizes can be obtained. It was possible to control the spatial resolution in mapping the investigated samples' surface and to achieve local chemical

information. In the present work, Q-switched neodymium-doped yttrium aluminum garnet laser has been used at its fundamental wavelength 1064 nm and its second harmonic 532 nm. The studied samples were specially manufactured heterogeneous copper–silver alloys with known grain size as studied via SEM investigation. The obtained LIBS results are in good agreement with those by other analytical techniques and extend the applicability of the surface techniques to study metallic ancient objects.

Keywords: Surface; Cu-Ag ; Alloys; Laser.

608. Monitoring of Somatic Cells in Milk Via Laser Analytical Techniques for the Early Detection of Mastitis

Z. Abdel-Salam, S. A. Attala and E. Daoud and M. A. Harith

Mastitis is an inflammatory infection of the mammary glands in dairy cattle, which causes a pronounced increase in milk somatic cell count accompanied by changes in milk elemental and molecular composition. The aim of the present study was to use different laser analytical techniques for fast, accurate, and easy diagnosis of mastitis. Both laser-induced breakdown spectroscopy (LIBS) and laser-induced fluorescence (LIF) techniques were used for this purpose. The study was performed on milk samples taken from 150 Holstein cows. The results obtained by LIBS showed that in healthy milk (milk from uninfected cows), the intensities of calcium spectral lines were clearly higher than in mastitic milk samples. On the contrary, the intensities of the two sodium D-lines were higher in mastitic milk than in the healthy milk. A linear relationship exists between the sodium spectral line intensities and the average of corresponding somatic cell count (SCC). Adopting LIF, the fluorescence intensity was also found to correlate linearly with the SCC of milk samples. Comparing the two proposed laser analytical techniques with other conventional techniques showed that the proposed techniques are faster, much easier, cost-effective, and can be used in situ to monitor somatic cells for diagnosis of mastitis.

Keywords: Mastitis diagnosis; SCC sodium and calcium; Laser analytical techniques.

609. Laser-induced Breakdown Spectroscopy in Africa

M. A. Kasem and M. A. Harith

Laser-induced breakdown spectroscopy (LIBS), known also as laser-induced plasma spectroscopy (LIPS), is a well-known spectrochemical elemental analysis technique. The field of LIBS has been rapidly matured as a consequence of growing interest in real-time analysis across a broad spectrum of applied sciences and recent development of commercial LIBS analytical systems. In this brief review, we introduce the contributions of the research groups in the African continent in the field of the fundamentals and applications of LIBS. As it will be shown, the fast development of LIBS in Africa during the last decade was mainly due to the broad environmental, industrial, archaeological, and biomedical applications of this technique.

Keywords: Laser; Africa; LIBS; Bilogical.

Dept. of Laser Sciences and Interactions (LSI)

610. Electronic Changes Induced by Surface Modification of Cu₂₋ₓS Nanocrystals

Willi Aigner, Gergana K. Nenova, Mahmoud A. Sliem, Roland A. Fischer, Martin Stutzmann and Rui N. Pereira

Copper sulfide nanocrystals ($Cu_{2-x}S$ NCs) consisting of earth-abundant and nontoxic elements have attracted attention for optoelectronic and plasmonic applications due to their tunable light absorption and emission properties.

In this work, we present a study of the electronic changes induced in organic- capped Cu_{2-x} NCs by surface modification treatments using charge transport and optical spectroscopy measurements. We have investigated surface treatments yielding ligand exchange and also ligand removal as well as changes in electronic defect density. The structural and morphological changes induced by the treatments were monitored by infrared spectroscopy, electron microscopy, and electron paramagnetic resonance.

Untreated $Cu_{2-x}S$ NCs exhibit a strong absorption band arising from a localized surface plasmon resonance (LSPR). We found that using a ligand exchange procedure (ethanedithiol treatment), the electrical conductivity in lms of $Cu_{2-x}S$NCs can be enhanced by 5 orders of magnitude, while maintaining other electronic properties of the individual NCs like optical absorption and LSPR. The improvements in the electrical conductivity were attributed to the reduction of the inter-NC separation in the films, as revealed by the structural and morphological studies. We also have observed that ligand removal treatments such as thermal annealing and hydrazine treatment yield a LSPR red-shift, while the electrical conductivity increases by up to 5 and 7 orders of magnitude, respectively. We proposed a model for the surface reactions taking place during these treatments. Our work highlights the potential of simple chemical or thermal treatments in tailoring the electronic properties of $Cu_{2-x}S$NCs, making thermally treated $Cu_{2-x}S$NCs interesting for tunable plasmonic and optoelectronic applications.

Keywords: Copper sulfide; De nanocrystals; Surface modification; Tunable plasmonic and optoelectronic applications.

611. Synthesis and Implementation of Nano - Chitosan and its Acetophenonederivative for Enhanced Removal of Metals

Mohamed E. Mahmoud, Maram T.H. Abou Kana and Ahmed A. Hendy

In the present study, nano-chitosan (Nano-Ch) was synthesized by ionic gelation of chi-tosan / tripolyphosphate system and successfully modified with acetophenone via Schiff's basecondensation to produce nano-chitosan-modified-actophenone (Nano-Ch-Ac). The produced nano-materials were characterized by FT-IR, SEM, HR-TEM and TGA techniques. The average particle sizeswere found in the range of 5.20–14.54 nm based on the HR-TEM analysis. The metal interaction proper-ties of Nano-Ch and Nano-Ch-Ac with Cu(II), Cd(II), Hg(II) and Pb(II) were compared in presence of variousexperimental parameters. Nano-Ch-Ac sorbent was found more superior in the extraction processes of allexamined metal ions under the evaluated experimental parameters. This trend was confirmed from thehighest determined metal sorption capacity values of metal ions as 1298–1608 and 810–1236 μmol g^{-1} in pH 7.0 by Nano-Ch-Ac and Nano-Ch sorbents, respectively. The adsorption equilibrium was establishedat 30.0 min of contact time by the two nano-chitosan sorbents. The superiority of Nano-Ch-Ac was alsoconfirmed from the dynamic applications of this nano-sorbent for removal of divalent metal ions fromtap water, sea water and industrial wastewater (91.3–100.0 ± 1.0–3.0).

Keywords: Nano-chitosan; Acetophenone; Characterization comparative removal; divalent metal ions.

612. Optical, Photo -physical Properties and Photostability of Pyrromethene (PM-597) in Ionic Liquids as Benign Green-Solvents

Dalal M.Al-Aqmar, H.I.Abdelkader and MaramT.H. Abou Kana

Laser dye pyrromethene-597 was dissolved with different concentrations in three types of ionic liquids (ILs): 1-Butyl-3-methylimidazolium chloride (BMIM Cl), 1-butyl-3-methylimidazolium tetrachloroaluminate (BMIM AlCl₄) and 1-butyl-3-methylimidazolium tetrafluoro-borate (BMIM BF₄) in addition to ethanol as reference solvent. This paper investigates optical spectra and some photo-physical parameters of PM-597 in BMIM Cl, BMIM AlCl₄, BMIM BF₄ and ethanol. These parameters are absorption and emission cross sections, fluorescence lifetime and quantum yield. The amplified spontaneous emission (ASE) was studied using the second harmonic Nd-YAG laser of 532 nm. Also, the gain and energy conversion efficiencies were investigated. Relatively high efficiency was obtained with good photostability in case of PM-597 in BMIM BF₄ that was a decrease to ~90% of the initial amplified spontaneous emission. This output energy was observed after pumping by 75,000 shots at a relatively high repetition rate of 10 Hz and pumping energy of 37 mJ. The composition and properties of the matrix of ILs were found to lead to optimize the laser performance and photostability of the investigated laser dye. In this study, we considered ionic liquids as the environmentally benign green solvents in place of volatile toxic organic solvents.

Keywords: Imidazolium ionic liquids; Pyrromethene laser Dye; Photophysical parameters; Optical properties; Green solvent.

613. Effects of Nanoparticles Size and Concentration and Laser Power Onnonlinear Optical Properties of Au and Au–CdSe Nanocrystals

Abeer Salah, A. Mansour, M.B. Mohamed, I.M. Azzouz, S. Elnaby and Y. Badr

Au and Au–CdSe nanoparticles (NPs) have been synthesized by organometallic pyrolysis method. Nano-crystals (NCs) structure was confirmed using high resolution transmission electron microscope (HRTEM)and X-ray diffraction (XRD). Nonlinear optical absorption is investigated by Z-scan technique usingnanosecond laser pulses of second harmonic Nd:YAG. Intensity-dependence of nonlinear absorptionon both nano-size

and concentrations is reported. These are interesting findings which can be usedto fabricate optical limiting and optical switching devices from NPs and hybrid systems.

Keywords: Au plasmon; CdSe QDs; Nonlinear optical absorption.

614. Spectroscopic Properties and Amplified Spontaneous Emission of Fluorescein Laser Dye in Ionic Liquids as Green Media

Dalal M. Al-Aqmar, H.I. Abdelkader and Maram T.H. Abou Kana

Optical Materials, 47: 573-581 (2015) IF: 1.981

The use of ionic liquids (ILs) as milieu materials for laser dyes is a promising field and quite competitive with volatile organic solvents and solid state-dye laser systems. This paper investigates some photophysical parameters of fluorescein dye incorporated into ionic liquids; 1-Butyl-3-methylimidazolium chloride (BMIM Cl), 1-Butyl-3-methylimidazolium tetrachloroaluminate (BMIM AlCl4) and 1-Butyl-3-methylimidazolium tetrafluoroborate (BMIM BF4) as promising host matrix in addition to ethanol as reference. These parameters are: absorption and emission cross-sections, fluorescence lifetime and quantum yield, in addition to the transition dipole moment, the attenuation length and oscillator strength were also investigated. Lasing characteristics such as amplified spontaneous emission (ASE), the gain, and the photostability of fluorescein laser dye dissolved in different host materials were assessed. The composition and properties of the matrix of ILs were found that it has great interest in optimizing the laser performance and photostability of the investigated laser dye. Under transverse pumping of fluorescein dye by blue laser diode (450 nm) of (400 mW), the initial ASE for dye dissolved in BMIM AlCl4 and ethanol were decreased to 39% and 36% respectively as time progressed 132 min. Relatively high efficiency and high fluorescence quantum yield (11.8% and 0.82% respectively) were obtained with good photostability in case of fluorescein in BMIM BF4 that was decreased to 56% of the initial ASE after continuously pumping with 400 mW for 132 min.

Keywords: Fluorescein; Ionic liquid; Amplified spontaneous emission; Spectroscopic properties; Photostability.

615. Photophysical, Photochemical and Laser Behavior of Some Diolefinic Laser Dyes in Sol-Gel and Methyl Methacrylate/2- Hydroxyethyl Methacrylate Copolymer Matrices

Mahmoud A.S. Sakr, El-Sayed A. Abdel Gawad, Maram T.H. AbouKana and El-Zeiny M. Ebeid

Optics and Lasertechnology, 71: 178-186 (2015) IF: 1.647

The photophysical properties such as singlet absorption, molar absorptivity, fluorescence spectra, dipole moment, fluorescence quantum yields, fluorescence lifetimes and laser activity of 1,4-Bis (β-Pyridyl-2-Vinyl) Benzene (P_2VB) , 2,5-distyryl-pyrazine (DSP) and 1,4-bis(2-methylstyryl)benzene(MSB) diolefineic laser dyes have been measured in different restricted hosts. (P_2VB), (DSP) and (MSB) are embedded in transparent sol-gel glass and copolymer of methyl methacrylate (MMA) and 2-hydroxyethyl

methacrylate (HEMA) media. The absorption and fluorescence properties of these laser dyes in sol-gel glass matrices are compared with their respective properties in copolymer host. The photostability of these laser dyes in sol-gel glass and (MMA/ HEMA) copolymer samples are measured in terms of half- life method (using nitrogen laser pumping; 337.1nm in pumping), as the number of pulses necessary to reduce the dye laser intensity to 50% of its original value. The gel laser materials show improved photostability upon pumping by nitrogen laser compared with those in organic polymeric host matrix.

Keywords: Diolefinic laserdyes Sol–Gel hostmatrix copolymer matrix photostability.

616. Influence of metallic Silver Nano Particles on Photo-Physical Properties of Pyrromethene PM567 Laser Dye in Liquid and Solid Hosts

A.-S.Gadallah, Ibraheem A. Alhijry, H.I. Abdelkader and MaramT. H.Abou Kana

Optics and Lasertechnology, 74: 178-186 (2015) IF: 1.647

The influence of [Ag NPs: PM567] complex formation on optical properties of parent PM567 laser dye in 2-hydroxyethyl methacrylate (homomonomer, homopolymer) and 2-hydroxyethyl methacrylate/methyl methacrylate (comonomer, copolymer) hosts was studied at room temperature. The silver nanoparticles were synthesized by chemical reduction method. Its size and concentration was determined by high resolution transmission electron microscope and UV/VIS absorption spectroscopy. The experimental results showed that the optical properties of dye were remarkably enhanced with optimum concentrations of NPs and dye. The effect of different nanoparticle concentrations on the optical properties of complex based not only on NPs and dye concentrations, but also on nature of milieu. Whereas, [1×10^{-4} mol/L PM567:40% C Ag NPs] and [1×10^{-3} mol/L PM567:40% C Ag NPs] were the optimum complexes in case of monomer and polymer hosts respectively. Also, at optimum concentration of PM567 dye in polymeric samples (1×10^{-3} mol/L), the gain values of dye in HEMA were 1.9 and 2.4 with respect to absence and presence of Ag NPs. While in HEMA/MMA copolymer, the gain values were 1.8 and 2.45 respectively. In a deeper study, [1×10^{-3} mol/L: 40% C Ag NPs] complex in HEMA/MMA copolymer host had preferable ASE Slope efficiencies and photostabilities, compared with complex in HEMA homopolymer host.

Keywords: Silver nanoparticles; Pyrromethene (567) dye laser; HEMA (Homomonomer, Homopolymer); HEMA/MMA (Comonomer ,Copolymer); Optical and photophysical properties; Localized surface plasmon resonance.

617. Effect of Thermal Annealing on the Structural and Optical Properties of Spin Coated Copper Phthalocyanine Thin Films

H.A. Afify, A.-S. Gadallah, M.M. El-Nahass and M. Atta Khedr

Journal of Molecular Structure, 1098: 161-166 (2015) IF: 1.602

Low cost sol–gel spin coating was used to deposit copper phthalocyanine (CuPc) thin films on both fused quartz and glass substrate. The prepared films were studied before and after

thermal annealing at 350 °C for 1 h in air. X-ray diffraction (XRD) and field emission scanning electron microscope (FESEM) were used to study the structural properties. From the structural characterization results, the films transformed from the metastable a-phase to the stable β-phase. Refractive index, absorption coefficient, and lattice dielectric constant were evaluated before and after annealing for the first time for spin coated CuPc thin films using spectrophotometric measurements in the spectral range 200–2500 nm. The values of the direct optical band gap of the as deposited film at 1.52 eV and 2.85 eV were redshifted to 1.4 eV and 2.42 eV for the annealed film. This shift is significant for near infrared photonics. The third order non-linear susceptibility was presented at lower photon energy for the CuPc films showing higher value for the annealed film.

Keywords: Copper phthalocyanine; Thin films; Spin coating; Annealing; Optical properties; Nonlinear susceptibility.

618. Ionization of Lithium Vapor by Nanosecond Resonant Laser Pulses Tuned to $2S \rightarrow 2P$ Transition

M A Mahmoud1, M A Khedr and M Nady

A theoretical study is reported for the resonant excitation and ionization of dense lithium vapor induced by nanosecond laser pulses, tuned to the resonance transition *2S–2P*. The lithium vapor with density (10^{14}–10^{16} cm^{-3}) is assumed to be excited and ionized by a laser beam with laser power of (10^5–10^6 W cm^{-2}) according to the experimental conditions of Skenderovic et al. (Phys Rev A 62:052707, 2000). The time evolution of electron energy distribution function and the electron density, the population density of the excited states as well as the atomic ion, are solved numerically. The numerical calculations of the electron energy distribution function show that nonequilibrium plasmas are produced in lithium vapor by laser irradiation of the *nS–nP* resonance line. The electrons in these plasmas are heated by superelastic collisions with atoms in the *nP* state giving a distribution of electrons in energy that is characterized by a series of spikes at energy separated by the *nS–nP* transition energy. In addition, the competition between photoionization processes and collisional ionization processes for producing the Li^+ as well as energy pooling collisions process of the excited lithium atoms plays essential roles in populating the highly excited states. Moreover, the results are found to be consistent with the experimental observations.

Keywords: Laser; Lithium; Collisional ionization; Energy pooling; Photoionization; Electron energy.

619. Analysis of Structural and Optical Properties of Annealed Fullerene Thin Films

M.M. El-Nahass, H.A.M. Ali1, A.-S. Gadallah, M.Atta Khedr, and H.A. Afify

Fullerene thin films were thermally deposited onto different substrates. The films annealed at 523 K for 10 h. X-ray diffraction technique was used to examine the structure of the films. The morphology of films was examined by field emission scanning electron microscopy. Fourier transform infrared spectra were recorded in wavenumber range 400–2000 cm^{-1}. The optical

characteristics were analyzed using UV-Vis-NIR spectrophotometric measurements in the spectral range 200–2500 nm. The refractive index and extinction coefficient were determined. Some dispersion parameters were calculated such as single oscillator energy, dispersion energy, dielectric constant at high frequency and lattice dielectric constant. As well as, the nonlinear optical susceptibility [3] and nonlinear refractive index n_2 were determined.

Keywords: Molecular physics and chemical physics.

Dept. of Medical Applications of Lasers (MAL)

620. Preparation and Clinical Evaluation of Nano-Transferosomes for Treatment of Erectile Dysfunction

Maha Fadel M Ali, Heba F Salem, Hany F Abdelmohsen and Sameh K Attia

Objective: The goal of the present study was to formulate topical nanocarriers of the low-cost vasodilator, papaverine hydrochloride (PH), as an alternative to the painful penile injections. The injections are used for both diagnosis and treatment of erectile dysfunction. Transdermal nano-transferosome (T), the ultraflexible nanoliposome, was used as a nanocarrier to enhance the penetration of the papaverine to the penis.

Methods: Different nano formulas were prepared and characterized for their encapsulation efficiency, particle size, zeta potential, and cumulative drug release. The formula acquired the best characteristics was incorporated into 2% (w/v) hydroxypropyl methylcellulose hydrogel base. The gel containing transferosomal papaverine hydrochloride (PH) and that containing free PH were clinically compared using color flow Doppler measurements.

Results: The results revealed that transferosome 3 (T3) had the highest entrapment efficiency approaching 72%, low particle size of 220 nm, and zeta potential of -33.4 mV. The formula released 73% of its initial drug content within 2 hours. The clinical evaluation showed the increase in the cavernous artery diameter from 0.53 mm to 0.78 mm and the increase in the peak systolic flow velocity from 5.95 cm/second to 12.2 cm/second, both of which were found to be significant at P <0.05.

Conclusion: It is evident from the study that the transferosomes can be used as a carrier of papaverine hydrochloride for both diagnosis and treatment of the erectile dysfunction. This new strategy could be used successfully in the treatment of erectile dysfunction and in male impotency.

Keywords: Transferosomes; Color doppler; Transdermal delivery; Papaverine hydrochloride.

621. Photodynamic Antibacterial Enhanced Effect of Methylene Blue-Gold Nanoparticles Conjugate on Staph Aureus Isolated from Impetigo Lesions. in Vitro Study

Abeer Attia Tawfik, Jehan Alsharnoubi and Mona Morsy

Background: Staphylococcal aureus (Staph. Aureus) is the most common organism which has been encountered in impetigo infection. Gold nanoparticles can be used as a tool to deliver antimicrobials or to enhance photodynamic destruction of bacteria **Objective:** to evaluate the photodynamic effect of methylene blue gold nanoparticles (MB- Gold nanoparticles conjugate) on Staph. aureus which were isolated from impetigo lesions. Patients and methods: Twenty children were diagnosed clinically as impetigo, and aged from 3-5 years of both sexes were recruited in the study. Two bacteriological samples were collected from each patient, identified and cultured. Samples of staph aureus of a concentration of 10-1ml were divided into 4 groups. Staph aureus was treated by MB-Gold nanoparticles conjugate, gold nanoparticles, MB, and the fourth group served as a control group. Diode laser (660nm), was used for photoactivation. The bacterial growth inhibition was determined by 2 methods: the percentage of reduction of viable bacteria count and the optical density (O.D) of bacterial growth

Results: The highest significant inhibitory effect on Staph .aureus was obtained with MB-Gold nanoparticles conjugate when irradiated by diode laser 660nm (P<0.0001). The percentage of viable bacteria was 3%. The photoactivated Gold nanoparticles showed a significant inhibitory effect on bacterial growth (p<0.05). A non significant inhibitory effect was elicited in other groups

Conclusion: The photoactivated MB-Gold nanoparticles conjugate showed the maximum inhibitory effect on staph aureus activity. The gold nano-particles proved efficacy as a drug delivery system. It enhanced the photodynamic antibacterial effect of metheylene blue.

Keywords: Gold nanoparticles; Methylene blue; Diode laser.

622. Effect of Methylene Blue -mediated Photodynamic Therapy for Treatment of Basal Cell Carcinoma

Nevien A. Samy, Manal M. Salah, Maha F. Ali and Ahmed M. Sadek

Photodynamic therapy (PDT) is regarded as a treatment option for basal cell carcinoma (BCC). The aim of this study is to investigate the efficacy of methylene blue (MB)- based PDT in patients suffering from nodular or ulcerative BCCs. This study is a prospective clinical trial with a 6- months follow-up. The study setting is at the Dermatology Clinic at NILES, Cairo University, Egypt. Seventeen patients complaining of nodular BCC (nBCC) and three patients complaining of ulcerative BCC (uBCC) were taken as samples. Methylene blue, the photosensitizer, was prepared in two different formulas: liposomal-loaded MB (LMB) was prepared and formulated in hydrogel (MB 0.2 %) to be used topically alone for treating BCCs <2 cm in diameter or to be combined with intralesional injection (ILI) of free MB 2 % aqueous solution for treating BCCs =2 cm in diameter. A session was performed every 2 weeks until complete response (CR) of the lesion or for a maximum of six sessions. Clinical assessments of clinical improvement, dermatological photography, monthly follow-up visits for 6 months, and skin biopsy after 3 months of follow-up to confirm the response, recurrence, or both in cases in which the clinical evaluation was ambiguous. Seventeen patients of the 20 completed the study, 11 patients achieved CR with very good cosmetic outcomephotosensitizer tolerance, and minimal

reported side effects. MB is a cheap promising alternative photosensitizer for PDT of nBCC.

Keywords: Methylene blue; Photodynamic therapy ;Basal cell carcinoma; Liposomes.

623. Laser Acupuncture Effect on Fetal Well-Being During Induction of Labor

Jehan Alsharnoubi, Amal Khattab and Amr Elnoury

Labor induction with traditional drugs is sometimes associated with fetal complications as fetal distress or death. The aim of this study was to evaluate the effect of labor induction by laser acupuncture on fetal well-being in postterm pregnancy. Nulliparous women at 40 weeks or greater were randomized to sham laser group versus laser acupuncture group. Each session consisted of laser application on bilateral points LI 4, SP 6, BL 31, and BL 32. The study was conducted in Cairo University, National Institute of Laser Enhanced Sciences. Sixty nulliparous women were randomized into laser acupuncture group n=30 and control group n=30.Women were treated in both groups in three consecutive days in post-date pregnancy. Results (66.6 %) showed a significant difference in rate of normal vaginal delivery (NVD) between acupuncture group (50 %) and control group (50 %) (p=0.002). There was no significant difference of enrollment delivery time between laser acupuncture and sham groups (p>0.05). There were six cases of cesarean section (CS) due to no fetal movement with normal cardiotocography (CTG). Laser acupuncture has no effect on fetus, and its effect on fetalmovement needsmore investigations. Laser can induce labor if the cervical length is less than 1 cm and dilation (0).

Keywords: Laser; Acupuncture; Labor; Induction.

624. New Topical Photodynamic Therapy for Treatment of Hidradenitis Suppurativa Using Methylene Blue Niosomal Gel: A Single-Blind, Randomized, Comparative Study

Fadel M A and Tawfik A A

Background: Hidradenitis suppurativa (HS), is a chronic, recurrent dermatosis affecting skin that contains apocrine glands. Photodynamic therapy using aminolaevulinic acid (ALA) activated by intense pulsed light (IPL) have shown variable success rates, with some adverse effects.

Aims: To evaluate the efficacy and safety of methylene blue (MB) as a photosensitizer delivered as a niosomal gel for the treatment of HS using IPL.

Methods: We enrolled 11 patients with HS in the study, which was a randomized split-body study. One side of each patient's body was treated with niosomal MB (NMB) gel and the other side was treated with unloaded (free) MB (FMB) gel. The affected sites were irradiated using IPL with a 630 nm filter. Patients were followed up at 1, 3 and 6 months after treatment.

Results: Drug release from the FMB gel was significantly higher (P > 0.05) than from the NMB gel. Lesions showed 77.3% and 44.1% reduction on the NMB and FMB sides, respectively. A significant reduction in the Hidradenitis Suppurativa Lesion, Area

and Severity Index (HS-LASI) after treatment was elicited in both groups, with no pain, erythema or hyperpigmentation. **Conclusion:** The combination of MB as a photosensitizer activated with 630 nm IPL as a light source is a successful PDT for HS. Delivery of MB in niosomes was more effective for drug penetration to the dermis compared with delivery by FMB gel. The 630 nm filter was not only a source of activation of MB but also a means of hair-follicle destruction.
Keywords: Hidradenitis suppurativa; hotodynamic; IPL.

625. Topical Timolol Solution Versus Laser in Treatment of Infantile Hemangioma: A Comparative Study

Abeer A. Tawfik and Jehan Alsharnoubi

Pediatr Dermatol, 32(3): 369-376 (2015) IF: 1.015

Lasers, 595-nm pulsed dye and 1,064-nm neodymium-doped yttrium aluminum garnet (Nd:YAG), have been used successfully for the treatment of infantile hemangiomas (IHs). Recently the use of a topical β-blocker, specifically timolol maleate, has been promising in the treatment of IHs. The objective of this study was to compare the effectiveness of topical timolol 5 mg/mL solution with that of combined sequential dual-wavelength laser in the treatment of IHs. Sixty children with IHs were divided randomly into two equal groups. Group 1 was treated with applications of timolol drops (5 mg/mL) twice daily. Group 2 was treated with sequential pulsed dye and Nd:Yag laser. Treatments were performed every month for a maximum of six sessions. Efficacy was evaluated clinically and by measuring the average hemoglobin level. A significant decrease in the average hemoglobin level was determined in both groups and a dramatic response was observed in superficial hemangiomas in the timolol group. The timolol group received treatment for an average of 4.0 ± 1.1 months and the laser group for 5.5 ± 0.9 months. The degree of improvement of mixed hemangiomas to laser treatment was greater than that of the timolol group. During 3 months of follow-up, no further improvement or relapse was reported in either group. Timolol solution is a safe and effective alternative to laser treatment in superficial hemangiomas. In mixed hemangiomas, the combined sequential 595-nm and 1,064-nm dual-wavelength laser provided better results than timolol solution because it penetrated deeply so that deep dermal blood vessels were reached.
Keywords: Topical timolol; Hemangioma; Laser.

(2)
Engineering Sciences Sector

2-1 Faculty of Engineering

2-2 Faculty of Computers and Information

2-3 Institute of Statistical Studies and Research

Faculty of Engineering

Dept. of Aeronautics and Aerospace Engineering

626. Aero-elastic Characteristics of Tapered Plate Wings

Mohamed Mahran, Hani Negm and Adel El-Sabbagh

In the present work an aero-elastic model is presented to study flutter and divergence of isotropic plate wings. A finite element model is subsequently developed to apply the theoretical model and predict the performance of plate wings. A divergence analysis is carried out using the finite element model combined with the vortex lattice method for aerodynamic load calculations. The flutter analysis is carried out using a finite element model combined with the doublet lattice method. The aerodynamic model is coupled to the structural model using the shape (interpolation) functions of the finite element model. Static condensation is used to express the finite elements' in-plane degrees of freedom in terms of the bending ones, hence reducing the number of the elements' degrees of freedom per node to three. A MATLAB code is developed to implement the proposed model using three-node triangular finite elements. The present model is validated using benchmark problems available in the literature, and the effects of taper ratio on both divergence and flutter speeds and flutter frequency are studied.
Keywords: Aero-elasticity; Divergence; Flutter; Finite element method; Vortex lattice method; Doublet lattice method.

Dept. of Chemical Engineering

627. Optimization and Comparative Analysis of LNG Regasification Processes

M.F.M. Fahmy, H.I. Nabih and T.A. El-Rasou

LNG (liquefied natural gas) receiving terminals are responsible for assuring that regasified LNG meets pipeline specifications and accordingly, certain compositional modifications of the received LNG are anticipated by the industry. Meeting pipeline specifications of lower heating value range of natural gas through extraction of heavy components; C_2^+ can yield additional revenue. The objective of this study is to investigate LNG regasification systems in an attempt to achieve the requirements of maximum C_2^+ recovery and utmost gains from products sales while meeting pipeline specifications with respect to the heating value range of the natural gas. Different LNG regasification process configurations are analyzed through examining their respective operating variables and conditions that influence these regasification systems. A computer simulation is conducted and the investigated parameters are de-methanizer feed temperature, de-methanizer column pressure, number of de-methanizer column trays, mole percent of methane in bottom product from de-methanizer, outlet compressor pressure, refrigeration recovery exchanger outlet temperature, outlet air cooler temperature, split fraction of LNG from LNG pumps and residue gas heater temperature. The operating parameters of each process configuration are optimized and results reveal the optimum configuration providing the maximum amount of C_2^+ recovery and allowing maximum net gain.

Keywords: Liquefied natural gas; Regasification processes; Pipeline specifications.

628. A Rigorous Simulation-based Procedure for Retrofitting an Existing Egyptian Refinery Distillation Unit

Mamdouh A. Gadalla, Omar Y. Abdelaziz, Dina A. Kame and Fatma H. Ashour

The simulation of existing crude oil distillation processes is distinctive and difficult owing to its complex nature and interactions, including variable feedstocks, highly integrated processes, tight cuts specifications, and environmental limitations. This study introduces a systematic simulation-based algorithm for retrofitting an existing crude distillation column. The algorithm accounts for all details of the associated heat recovery system. Both distillation unit and HEN (heat exchanger network) are addressed simultaneously in the simulation. The proposed procedure is applied to simulate an existing CDU (crude distillation unit) processing 100,000 bbl/d crude oil of an Arabian origin. The rigorous simulation model achieved can fully describe the existing plant performance, and for this it is thus validated with the actual data for column operation parameters, cuts flow and specification, and for all details of heat exchanger network. The results are found in a good agreement with the actual data. The model is then applied for optimisation and revamping projects to minimise the energy consumption and the amount of CO2 emissions from the refinery. The advantage of the simulation model is its relevance to refining industries in performing any future revamping studies, modification tests, product changes, and capacity enhancement.
Keywords: Crude distillation unit; Modelling; Retrofit; Energy saving; Heat exchanger networks; Optimization.

629. Feasibility Assessment of Diesel Fuel Production in Egypt Using Coal and Biomass: Integrated Novel Methodology

A. Wafiq and M. Hanafy

Diesel fuel shortage is one of the main energy crisis components in Egypt as it is heavily employed in the electricity and transportation sectors. CtL (Coal to Liquids) and CBtL (combined Coal and Biomass to Liquids) are promising routes which can be currently applied for diesel production in Egypt. This paper will propose a novel methodology to drive the CBtL/CtL routes forward in Egypt. The methodology is based on using Miscanthus as biomass material and utilizing the Egyptian "Maghara" coal. It recommends some measures to improve project economics and simultaneously provide solutions to other strategic national problems including the poor sewage infrastructure and the unutilized desert areas. Eight scenarios were studied; four for each route with variable production capacities (450, 900, 1,350, 1,800 t_{diesel}/d). To evaluate the scenarios, the diesel price was fixed at $50 below its current import price, and the corresponding discount rate and payback period were calculated. At high capacities, both routes are economically feasible (discounted interest rate of about 17%) and less sensitive to the price variation

Engineering Sector

of equipment, raw materials and byproducts. Implementing the CBtL route can be regarded as a strategic project as besides being economically feasible, it offers crucial social and environmental benefits.

Keywords: Diesel; Gasification; Miscanthus; Coal; Feasibility; Co_2.

630. A Hierarchical Approach for the Design Improvements of an Organocat Biorefinery

Omar Y. Abdelaziz, Mamdouh A. Gadalla, Mahmoud M. El-Halwagi and Fatma H. Ashour

Bioresource Technology, 181: 321-329 (2015) IF: 4.494

Lignocellulosic biomass has emerged as a potentially attractive renewable energy source. Processing technologies of such biomass, particularly its primary separation, still lack economic justification due to intense energy requirements. Establishing an economically viable and energy efficient biorefinery scheme is a significant challenge. In this work, a systematic approach is proposed for improving basic/ existing biorefinery designs. This approach is based on enhancing the efficiency of mass and energy utilization through the use of a hierarchical design approach that involves mass and energy integration. The proposed procedure is applied to a novel biorefinery called Organocat to minimize its energy and mass consumption and total annualized cost. An improved heat exchanger network with minimum energy consumption of 4.5 MJ/kgdry biomass is designed. An optimal recycle network with zero fresh water usage and minimum waste discharge is also constructed, making the process more competitive and economically attractive.

Keywords: Organocat; Biorefinery; Energy saving; Pinch analysis; Mass recycle.

631. Factorial Design Analysis for Optimizing the Removal of Cesium and Strontium Ions on Synthetic Nano-sized Zeolite

O.A.Abdel Moamen, I.M.Ismail, N.Abdel Monem and R.O.Abdel Rahman

Journal of the Taiwan institute of chemical engineers, 55: 133-144 (2015) IF: 3

Cesium and strontium ions removal from aqueous solution onto nano-sized zeolite was investigated using uni-variant and multi-variant procedures. Nano-zeolite Y was prepared using hydrothermal method and characterized by X-ray diffraction, X-ray fluorescence, transmission electron microscopy, and Fourier transformed infrared spectroscopy. Direct space approach was adopted to simulate the crystallographic structure and calculate the chemical formula. Removal kinetics and equilibrium isotherms were studied and the reaction nature, parameters, and most suitable models to predict sorption capacity were identified using linear and non-linear regression techniques. Multi-variant procedure was used to optimize the removal process and deduce equation to predict the removal efficiency. The results indicated that the prepared material belongs to nano-dehydrated zeolite Y family and referred to the possibility of metal ion entrapping within zeolite framework. Cs^+ ions have higher removal than Sr^{2+}, and the removal is controlled by external mass transfer through the boundary within the first 40 min then controlled by intra-

particle diffusion. Temperature and pH are the most influential variables, whereas initial metal concentration and time affect the process to lesser extent. Cs^+ removal was found more reliable under different operating conditions than Sr^{2+}.

Keywords: Factorial design; Radioactive waste treatment; Nano-zeolite; Models.

632. Nonlinear Parameter Estimation of e-NRTL Model for Quaternary Ammonium Ionic Liquids Using Cuckoo Search

J.E. Jaime-Leal, A. Bonilla-Petriciolet, V. Bhargava and S.E.K. Fateenc

Chemical Engineering Research and Design, 93: 464-472 (2015) IF: 2.348

This study introduces the bio-inspired computation method namely Cuckoo Search (CS) as a parameter estimation method for modeling the mean activity coefficients of quaternary ammonium aqueous ionic liquids using the e-NRTL model. CS has not been used before to address this particular parameter estimation problem. Our calculations showed that the CS method was robust to perform the data modeling of this thermodynamic property of ionic liquids and that it can offer a global success rate of ~90% for solving this challenging thermodynamic problem. CS offers a better performance than those obtained using other stochastic optimization methods such as simulated annealing, differential evolution, genetic algorithm or particle swarm optimization. This study highlights the capabilities of CS for facing challenging global optimization problems involved in the thermodynamic modeling of ionic liquids. We also show that the complexity of parameter estimation problems of ionic liquids appears to be determined by the type of cation and anion involved. Specially, the problems that involve ionic liquids containing [NH4+] and alkylsulfonates ions are more challenging.

Keywords: Ionic liquids; Cuckoo search; Parameter estimation; Global optimization; Quaternary ammonium salts; e-NRTL model.

633. Three Dimensional Simulation of Negative-Magnetophoretic Filtration of Non-magnetic Nanoparticles

Seif-Eddeen K. Fateen and Mahmoud Magdyaa

Chemical Engineering Research and Design, 95: 69-78 (2015) IF: 2.348

Negative magnetophoresis of non-magnetic particles is the induced motion of non-magnetic particles suspended in magnetic media on the application of a magnetic field gradient. Negative magnetophoresis can be used to separate nanoparticles based on their size. An integrated finite-element model was developed using COMSOL to study the transport and separation of nonmagnetic particles in a negative magnetophoresis device. The model solves the magnetic field, fluid flow, and mass transfer equations in three dimensions. The model was used to successfully simulate an experimental separation device and was also used as a tool to develop modified designs that resulted in a substantial enhancement of the separation efficiency. In addition, the model successfully predicted the different phenomena that

typically occur in a magnetophoretic device: trapping, focusing, and deflection.

Keywords: Negative magnetophoresis; Comsol; Nano-particle separation; Magnetophoretic separation.

634. Mass Transfer-fluid Flow Interactions in Perforated Plate Extractive Reactors

Reem S. Ettouney, Mahmoud A. El-Rifai, Ayat O. Ghallab and Amira K. Anwar

Coupling between extraction, reaction, and liquid-liquid contact hydrodynamics have quantitative as well as qualitative implications on the performance of un-agitated perforated plate extractive reactors. Models, which take into account the effect of flow dynamics on mass transfer performance, are developed to analyze the steady state behavior of such columns when conducting a chemical reaction in the continuous extract phase. New expressions are derived for the composition profiles in the cases of physical extraction, slow, and infinitely fast reactions. Typical results show that the raffinate purity may either increase or decrease on increasing the solvent rate depending on the interaction between column fluid dynamics, mass transfer, and reaction kinetics.

Keywords: Extractive reactions; Mass transfer; Modeling; Perforated plate columns.

635. On the Performance of Swarm Intelligence Optimization Algorithms for Phase Stability and Liquid-Liquid and Vapor-liquid Equilibrium Calculations

Seif-Eddeen K. Fateen and Adrián Bonilla-Petriciolet

This study introduces new soft computing optimization techniques for performing the phase stability analysis and phase equilibrium calculations in both reactive and non-reactive systems. In particular, the performance of the several swarm intelligence optimization methods is compared and discussed based on both reliability and computational efficiency using practical stopping criteria for these applied thermodynamic calculations. These algorithms are: Intelligent Firefly Algorithm (IFA), Cuckoo Search (CS), Artificial Bee Algorithm (ABC) and Bat Algorithm (BA). It is important to note that no attempts have been reported in the literature to evaluate their performance in solving the phase and chemical equilibrium problems. Results indicated that CS was found to be the most reliable technique across different problems tried at the time that it requires similar computational effort to the other methods. In summary, this study provides new results and insights about the capabilities and limitations of bio-inspired optimization methods for performing applied thermodynamic calculations.

Keywords: Swarm intelligence; Optimization methods; Phase equilibrium; Phase stability; Chemical equilibrium.

Dept. of Computer Engineering

636. Methodologies for the Modeling and Simulation of Biochemical Networks, Illustrated for Signal Transduction Pathways: A Primer

Nesma ElKalaawy and Amr Wassal

Biochemical networks depict the chemical interactions that take place among elements of living cells. They aim to elucidate how cellular behavior and functional properties of the cell emerge from the relationships between its components, i.e. molecules. Biochemical networks are largely characterized by dynamic behavior, and exhibit high degrees of complexity. Hence, the interest in such networks is growing and they have been the target of several recent modeling efforts. Signal transduction pathways (STPs) constitute a class of biochemical networks that receive, process, and respond to stimuli from the environment, as well as stimuli that are internal to the organism. An STP consists of a chain of intracellular signaling processes that ultimately result in generating different cellular responses. This primer presents the methodologies used for the modeling and simulation of biochemical networks, illustrated for STPs. These methodologies range from qualitative to quantitative, and include structural as well as dynamic analysis techniques. We describe the different methodologies, outline their underlying assumptions, and provide an assessment of their advantages and disadvantages. Moreover, publicly and/or commercially available implementations of these methodologies are listed as appropriate. In particular, this primer aims to provide a clear introduction and comprehensive coverage of biochemical modeling and simulation methodologies for the non-expert, with specific focus on relevant literature of STPs.

Keywords: Biochemical networks; Signal transduction pathways; Modeling and simulation; Stochastic methods; Ordinary differential equations; Partial differential equations.

637. On the Computational Power of WECPAR

Hatem Mahmoud El-Boghdadi

Reconfigurable models were shown to be very powerful in solving many problems faster than non-reconfigurable models. WECPAR $W(M, N, k)$ is an $M \times N$ reconfigurable model that has point-to-point reconfigurable interconnection with k wires between neighboring processors. This paper studies several aspects of WECPAR. We first consider solving the list ranking problem on WECPAR. Some of the results obtained show that, ranking one element in a list of N elements can be solved on $W(N, N, N)$ WECPAR in $O(1)$ time. Also, on $W(N, N, k)$, ranking a list $L(N)$ of N elements can be done in $O((\log N)(\log_{k+1} N))$ time. Then, we assess the relative computational power of WECPAR and transfer a large body of algorithms to work directly on WECPAR. We introduce several simulation algorithms between WECPAR and well-known models such as PRAM and RMBM. Simulation algorithms show that a PRIORITY CRCW PRAM $P(N, S)$ of N processors and S shared memory locations can be simulated on $W(S, N, k)$ WECPAR in $O(\log_{k+1} N + \log_{k+1} S)$ time. Also, we show that a PRIORITY CRCW basic RMBM(P, B), of P processors and B buses can be simulated on $W(B, P + B, k)$ WECPAR in $O(\log_{k+1}(P + B))$

time. This directly migrate a large number of algorithms to work on WECPAR with the simulation overhead.

Keywords: Parallel algorithms; Simulation algorithms; List ranking.

638. A Novel Power-Efficient Multi-Operand Digit-Multiplier Using Reconfiguration and Clock Gating

Essam Elsayed and Hatem M. El-Boghdadi

The Journal of Supercomputing, 71: 2539-2564 (2015) IF: 0.858

Digit serial–serial multipliers are one approach to power-optimize multiplication where operands are fed one digit at a time. This significantly reduces the required chip area and hence reducing power. In this paper, a power-efficient reconfigurable digit serial–serial multiplier is proposed. Power efficiency is achieved using two techniques: reconfiguration and clock gating. Reconfiguration allows the proposed multiplier to perform multiplication of sub-width operands without extending to full width, that is, a multiplier composed of m sub-multipliers each of width n is capable of handling $mn \times mn$, $1/2mn \times 1/2mn$, $1/4mn \times 1/4mn, \ldots, n \times n$ multiplications. It also enables the multiplier to perform multiple multiplications concurrently rather than sequentially, that is, the multiplier is capable of handling $1 \times (mn \times mn)$, $2 \times (1/2mn \times 1/2)$, $4 \times (1/4mn \times 1/4mn), \ldots, m \times (n \times n)$ multiplications concurrently. Mathematical operations such as matrix product benefit most from concurrent multiplications. Clock gating is used to reduce power by disabling unused blocks and enabling utilized blocks only when their relevant inputs arrive. Compared with non-reconfigurable no-clock-gating design, simulation results show that the proposed multiplier reduces the power requirement. For m=2, n=32, and digit width d=4 power is reduced by 38 % for 32×32 mode and by 49 % for $2 \times (32 \times 32)$ mode. Compared with standard parallel multiplier, simulation results also show that the proposed multiplier reduces energy requirement. For m=2,n=32, and digit width d=32, energy is reduced by 46 % for 32×32 mode and by 60 % for $2 \times (32 \times 32)$ mode.

Keywords: Digit serial–serial multiplier; Reconfiguration; Clock gating; Power efficiency.

639. A Cost-Efficient Congestion Management Methodology for Fat-trees Using Traffic Pattern Detection

Abeer Farouk and Hatem M. El-Boghdadi

The Journal of Supercomputing, 71: 1249-1276 (2015) IF: 0.858

Interconnection networks have a great impact on the performance of paral- lel systems. These networks provide the communication mechanism and framework needed by parallel applications. One such important network is fat-tree. Selection func- tions were shown to have a great impact on the performance of fat-trees. Selection func- tions perform differently under certain traffic patterns. The stage and destination prior- ity (SADP) selection function was shown to have better performance in case of uniform traffic while the stage and origin priority (SAOP) selection function was shown to per- form better in case of hot-spot traffic. In this paper, we propose a cost-efficient conges- tion management mechanism for fat-trees that choose a certain selection function for certain traffic pattern. The mechanism has

the ability to detect the current traffic pat- tern and switch to a certain selection function that is proved to give better performance under the detected traffic pattern. This directly decreases the congestion in the network. First, we analyze the hot-spot traffic in fat-trees if SADP selection function is used. We derive a condition for the existence of hot-spot traffic if SADP function is used. We give an implementation for detecting this condition. Once this condition is detected, the network is forced to switch to use the SAOP selection function. Then, we use the analysis of SAOP to derive a condition to detect that a non hot-spot traffic exists in the fat-tree. We give an implementation for detecting this condition. In turn, we switch back to the SADP selection function. We use synthetic workloads to show the accuracy of the proposed mechanism for detecting the hot-spot traffic in the network. We show that the proposed mechanism incurs a constant number of bits per physical link as an overhead. Finally, we compare the proposed mechanism with other techniques.

Keywords: Traffic detection; Congestion management; Fat-tree.

640. Dynamic-Width Reconfigurable Parallel Prefix Circuits

Hatem M. El-Boghdadi

The Journal of Supercomputing, 71: 1177-1195 (2015) IF: 0.858

Parallel prefix circuits have drawn high interest because of their importance in many applications such as fast adders. Most proposed parallel prefix circuits assume fixed width. The input size could be of the same width as the circuit or different than the width of the circuit. In this paper, we propose a class of reconfigurable parallel prefix circuits, ˘R -circuits, that support different operational modes. The ˘R-circuit can be reconfigured as one parallel prefix circuit of high width as well as several smaller width parallel prefix circuits that can operate on different prefix problems in parallel.In particular, an ˘R-circuit, ˘R (k(m)), of width km with k building blocks (slices) each of width m, can be configured as a number of z prefix circuits, $z \leq k$, each of width bj, such that Σz j=1 bj = km. For a circuit CRb $\in$ ˘R (k(m)) of b slices and width bm, we show how such circuit can be constructed.We derive a bound for the depth ofCRb and show how CRb can handle input size $n \geq bm$. Then, we show the performance of ˘R (k(m)) and compare it with other fixed same-width prefix circuits.

Keywords: Dynamic-width circuits; Prefix operations; Parallel algorithms; Reconfigurable circuits.

641. Constant Time Collision-Free Path Computation on R-Mesh with Path Quality Analysis

Hatem M. El-Boghdadi

Journal of Circuits, Systems and Computers, 24: 1550112-1550112 (2015) IF: 0.25

The reconfigurable mesh (R-Mesh) was shown to be a very powerful model capable of extremely fast solutions to many problems. R-Mesh has a wide range of applications such as arithmetic problems, image processing and robotics. The 2D R-Mesh was shown to be able to solve the path planning problem very fast. In this paper, we propose an algorithm to compute a collision-free path, P, between a source and a destination in an

environment with the existence of obstacles. Independent of the number of obstacles, k, the proposed algorithm runs in constant time and requires $O(\log^2 N)$ pre-processing time where N is the size of the R-Mesh. This is in contrast to the previous work that requires $O(k)$ time with the same pre-processing time. We then consider the quality of the generated path. We present a constant-time modification to enhance the length of the path and analyze the generated path P in terms of the number of bends in P. We derive the number of bends in P for any set of obstacles. We also derive a necessary condition for the minimum number of bends in the path P, i.e., a lower bound on the number of bends. We finally identify a class of obstacles for which the above necessary condition is sufficient as well (tight bound).

Keywords: Path planning; Parallel algorithms; Reconfigurable mesh.

Dept. of Electric Power and Machines

642. Four-Axis Vector-Controlled Dual-Rotor PMSM for Plug-in Electric Vehicles

Amit Vilas Sant, Vinod Khadkikar, Weidong Xiao and H. H. Zeineldin

Dual-rotor permanent-magnet synchronous motors (PMSMs) offer the merits of higher efficiency, higher torque density, and inherent electric differential (ED). This paper proposes a novel four-axis vector-controlled dual-rotor PMSM drive for driving plug-in electric vehicles (PEVs). A four-axis d-q model of the dual-rotor PMSM is developed with the proposed three-phase to four-phase transformation. This transformation separately resolves the stator variables to the d-q-axes of the inner and outer rotor. Instead of applying back electromotive forces and rotor power angles, the d-axis fluxes are used for computing the displacement between the two d-q-axes, which is essential for the transformation. The proposed four-axis vector control of dual-rotor PMSM allows for the independent control of stator quantities corresponding to the inner and outer rotors. This facilitates ED and better control under parametric differences, such as rotor inertia and permanent magnet flux for the inner and outer rotors. The comparison of the dual-rotor PMSM-based PEV operation with the proposed control and two earlier reported schemes reveals that the proposed scheme offers effective ED without the loss of vehicle control. Furthermore, the proposed configuration is validated with different drive cycles, including the loss modeling, sensitivity analysis, and efficiency mapping.

Keywords: Electrical differential (ED); Electric vehicle (EV); Plug-in electric vehicle (PEV); Traction control; Vector control.

643. Optimal Protection Coordination for Meshed Distribution Systems with DG Using Dual Setting Directional Over-Current Relays

H. H. Zeineldin, Hebatallah M. Sharaf, Doaa K. Ibrahim and Essam El-Din Abou El-Zahab

In the presence of distributed generation (DG), it is important to assure a fast and reliable protection system for the distribution network to avoid unintentional DG disconnection during fault conditions. In this paper, dual setting directional over-current relays are proposed for protecting meshed distribution systems with DG. Dual setting relays are equipped with two inverse time-current characteristics whose settings will depend on the fault direction. The protection coordination problem for the dual setting directional relay is formulated as a nonlinear programming problem where the objective is to minimize the overall time of operation of relays during primary and backup operation. The proposed protection coordination scheme using dual setting relays is compared against the conventional approach, which relies on the conventional one setting directional relay. The proposed scheme is applied to the power distribution network of the IEEE 30-bus system equipped with synchronous and inverter-based DG. The results show that the proposed protection coordination scheme with dual setting relay can significantly reduce the overall relay operating time, making it an attractive option for distribution systems with DG.

Keywords: Directional overcurrent relays; Distributed generation (DG); Optimization; Protection coordination; Tripping characteristics.

644. Scheduled Perturbation to Reduce Nondetection Zone for Low Gain Sandia Frequency Shift Method

Mohamed Al Hosani, Zhihua Qu and H. H. Zeineldin

It is known that the choice of gain (K) in the Sandia frequency shift (SFS) scheme has direct impacts on the stability of a system with grid-connected distributed generations (DGs). In this paper, a scheduled perturbation technique is proposed to reduce the stability impact of K. In the proposed technique, chopping fraction (cf) is used to compensate for reduction in the value of K, where higher cf values are used to achieve zero nondetection zone (NDZ) under low gain SFS. It is shown by analysis that theoretical reduction of NDZ can be always achieved for a nonzero value of cf. Simulations for single- and multi-DGs systems are performed to verify the analytical analysis. It is shown that an appropriate design of scheduled signal duty cycle (d) is of critical importance to realize the proposed reduction in NDZ. While close synchronization of perturbation signals for multi-DG system is required, a delay of 0.33 s is shown to be tolerated for a two-DG system. Synchronization can be achieved either through locally synchronized timers or by limited communication among DGs. The proposed technique provides an attractive option for systems with high DG penetration by reducing the negative impact of K on stability

Keywords: Distributed generation (DG); Islanding detection; Nondetection zone (NDZ); Sandia frequency shift (SFS).

645. Novel Coordinated Voltage Control for Hybrid Micro-Grid with Islanding Capability

Khaled A. Alobeidli, M. H. Syed, Mohamed S. El Moursi and Hatem H. Zeineldin

This paper proposes a new coordinated voltage control (CVC) method with reactive power management scheme (RPMS) for a

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hybrid micro-grid (MG). The CVC scheme, based on synchronizing the response speeds of different voltage regulating devices, is coordinated with novel RPMS. Two cases, with and without proposed CVC, were simulated in the power system computer aided design (PSCAD)/electromagnetic transients including dc (EMTDC) environment and compared against each other. The case with proposed CVC shows superior performance, when tested for fault triggered islanding, intentional islanding, and MG internal fault. Further, the proposed CVC with RPMS is compared to a voltage regulation method present in literature. The proposed CVC with RPMS provides better voltage regulation, maximizes the fast dynamic reactive power reserve, and improves the transient response and transient stability margin of the hybrid MG.

Keywords: Coordinated voltage control (CVC); Distributed energy resources (DER), Hybrid micro-grid (MG); Grid codes.

646. Incorporating PV Inverter Control Schemes for Planning Active Distribution Networks

Sultan S. AlKaabi, Vinod Khadkikar and H. H. Zeineldin

IEEE Transactions on Sustainable Energy, 6: 1224-1233 (2015) IF: 3.656

The distribution network planning under active network management (ANM) schemes is becoming of interest due to substantial benefits in facilitating the increasing integration of renewable energy sources. This paper presents various potential ANM schemes based on the photovoltaic inverter control (PVIC) considering enhanced utilization of the inverter reactive power capability. Depending on the active power generation of PV arrays, inverter size and desired reactive power settings, several PVIC schemes are proposed. The PVIC schemes are incorporated in the optimal power flow (OPF) and formulated as a nonlinear programming (NLP) problem. In this study, the PVIC schemes are applied to maximize the total wind-distributed generation (DG) penetration on a typical U.K. distribution system. Various case studies are presented and compared to evaluate the performance. The results show that the proposed schemes can significantly increase the wind penetration levels by 45.4% and up to 92.3%.

Keywords: Active network management (ANM); Distributed generation (DG); Optimal power flow (OPF); Power distribution planning.

647. A Parallel Capacitor Control Strategy for Enhanced FRT Capability of DFIG

Ł. Huche, Mohamed Shawky El Moursi and H. H. Zeineldin

IEEE Transactions on Sustainable Energy, 6: 303-312 (2015) IF: 3.656

This paper presents a novel dc-link scheme for enhancing the fault ride-through (FRT) capability of doubly fed induction generator-based wind turbine (DFIG-WT). The proposed system consists of parallel capacitors with a dedicated control strategy designed to provide means for power evacuation during grid fault conditions. This technically simple and cost-effective scheme was developed considering transmission line autoreclosing which may cause multiple fault inceptions. Simulation studies were carried out to compare the performance of the introduced solution with a

DFIG-WT, equipped with the dc chopper and crowbar. The simulation results demonstrate the enhanced performance of the proposed approach in maintaining the dc-link voltage, transient rotor voltages, and currents within the permissible operating range during a bolted three-phase-to-ground fault. The proposed schemes were also tested in response to asymmetrical grid faults, and the enhancement in transient response has been verified. An experimental setup was developed to emulate the behavior of the dc-link circuit during fault conditions. These experimental results demonstrate the effectiveness of the switching parallel capacitors in preventing dc-link overvoltage during imbalance power operation. The discharging capacitor circuit highlighted the capability of tackling the multiple fault inception problems while adhering to grid code requirements.

Keywords: Dc-link capacitor; Doubly fed induction generator (DFIG); Fault ride-through; Supercapacitor.

648. Eccentricity in Synchronous Reluctance Motors-Part II: Different Rotor Geometry and Stator Windings

Hanafy Mahmoud and Nicola Bianchi

IEEE Transactions on Energy Conversion, 30(2): 754-760 (2015) IF: 2.326

Referring to the analysis of the impact of the eccentricity on a synchronous reluctance motor presented in the companion paper (Part I), a comparison is carried out between rotors with symmetric and asymmetric flux-barriers. As an example, a four-polemachine with one or two flux-barriers per pole is used. In addition, the analysis is also applied to motors with fractional-slot coil windings. Both single- and double-layer windings are considered. As an example, a six-slot four-pole machinewith concentrated windings and 36-slot four-pole machine with distributed windings are compared. The analytical model which is proposed in Part I is used to predict the machine performance. A finite-element analysis confirms the results achieved by means of the analytical model.

Keywords: Analytical analysis; Concentrated windings; Distributed windings; Eccentricity; Finite-element (FE) analysis; Synchronous pm machines; Synchronous reluctance motor.

649. Eccentricity in Synchronous Reluctance Motors-part I: Analytical and Finite-element Models

Hanafy Mahmoud and Nicola Bianchi

IEEE Transactions on Energy Conversion, 30, (2): 745-753 (2015) IF: 2.326

In recent years, there is a growing interest for synchronous reluctance machines. This is due to their high torque density, flux-weakening operation capability, and high fault-tolerance capability. This paper deals with the analysis of a synchronous reluctance machine when eccentricity occurs. Both static and dynamic eccentricity are considered. An analytical model to predict the machine performance is described. As an example, a four-pole reluctance machine is analyzed, considering single, as well as multi flux-barriers per pole. The finite-element analysis confirms the results achieved by means of the proposed analytical model.

Keywords: Analytical analysis; Eccentricity; Finite-element analysis; Synchronous reluctance machine.

650. Allocation and Sizing of Distribution Transformers and Feeders for Optimal Planning of MV/LV Distribution Networks Using Optimal Integrated Biogeography Based Optimization Method

Mohamed Yosef, M.M. Sayed and Hosam K.M. Youssef

Optimization techniques have got much attention for solving complex problems related to different fields. Most of the planning researches deal with primary and secondary distribution systems separately because of complexity of both. This may lead to a local minimum for each but not a global minimum for both. In this paper, we try to reach the global minimum of joined primary and secondary distribution systems planning problem, which is essentially more complicated than planning each of them separately. To overcome such complexity, biogeography-based optimization (BBO) is employed in this work. BBO is a new technique for problem solving, developed by Dan Simon and has attracted wide attention in the last years. BBO is not a reproductive technique and this makes it distinguished from other strategies. Besides, BBO solutions can last or "survive" forever and are modified directly via migration from other solutions, so that BBO solutions directly share their features with other solutions. All of those above mentioned features of BBO algorithm may prove that it can perform efficiently for solving optimization problems and that it might be able to provide better performance compared to other optimization algorithms. In this paper, BBO is employed for solving the problem of optimal planning of a distribution system (OPDS) including both medium voltage (MV) and low voltage (LV) networks and based on uniform or non-uniform load density, where a planning procedure is employed iteratively to find the optimal location and rating of distribution transformers and substations, as well as the type and route of MV and LV feeders. The results are compared with genetic algorithm (GA) and particle swarm optimization (PSO), which indicate that BBO provides better performance in all cases
Keywords: Planning; Distribution network; Reliability; Optimization; BBO.

651. Development of Dynamic Estimators for Islanding Detection of Inverter-Based DG

Mohamed Al Hosani, Zhihua Qu. and H. H. Zeineldin

In this paper, a new islanding detectionmethod (IDM) is proposed to dynamically estimate islanding occurrence. The proposed dynamic estimators estimate amplitudes and phase angles of the current injected by the grid at the point of common coupling with the distributed generation (DG) in addition to the DG's bus voltage. A distributed two-level algorithm is proposed to detect an islanding condition for single and multi-DG configurations. Analytical design and transient analysis are carried out for the islanding detection problem to determine the nondetection zone

(NDZ) of the proposed islanding detection algorithm. A local lowfrequency meshed communication network is sufficient to achieve distributed islanding detection capability for a general multi-DG network with negligible NDZ. It is shown through simulations that the proposed IDM can successfully distinguish an islanding condition from other disturbances that may occur in power system networks.
Keywords: Distributed generation (DG); Dynamic estimator; Islanding detection methods (IDMS); Nondetection zone (NDZ); Quality factor; Transient response.

652. A Transient Stiffness Measure for Islanding Detection of Multi-Dg Systems

Mohamed Al Hosani, Zhihua Qu and H. H. Zeineldin

Islanding detection is important to ensure the reliability and safety of distributed generation (DG). In this paper, a new active islanding detection method (IDM) is proposed, and it depends on individually estimating an overall transient stiffness measure for any multi-DG system to establish a clear separation between prior- and post-islanding stiffness. For the multi-DG system to avoid spectrum overlapping, each of its DGs is required to perturb at distinct frequencies. By using this concept of perturbation separation, the proposed technique can be applied to multi-DG systems without requiring any communication among the DGs. Simulation results show that the proposed technique is scalable and robust against different loading conditions and variations of grid stiffness levels as well as with respect to the number of connected DGs and different types of DG controllers. It is also shown that the proposed technique can successfully distinguish islanding conditions from other disturbances that may occur in power system networks.
Keywords: Distributed generation (DG); Islanding detection; Quality factor; Stiffness; Transient response.

653. Optimal Coordination of Directional Overcurrent Relays Using A New Time–current–Voltage Characteristic

Khaled A. Saleh, H. H. Zeineldin, A. Al-Hinai and Ehab F. El-Saadany

With the integration of distributed generation (DG) to meshed distribution systems, the operating time of the protective system becomes a major concern in order to avoid nuisance DG tripping. This paper proposes a new time-current-voltage tripping characteristic for directional overcurrent relays (DOCRs) that can achieve a higher possible reduction of overall relays operating time in meshed distribution networks. The proposed tripping characteristic is described in detail. Moreover, the protection coordination problem is formulated as a constrained nonlinear programming problem to determine the optimal relay settings. The proposed characteristic is tested on the power distribution system of the IEEE 14 bus and IEEE 30 bus with inverter-based and synchronous-based DG units. The outcome of this study reveals that the new tripping characteristic for DOCRs achieves

notable reduction in total relays' operating time over the conventional characteristic.

Keywords: Directional overcurrent relay (DOCR); Distributed Generation (DG); Protection coordination; Tripping characteristic.

654. Distribution System Reconfiguration for Annual Energy Loss Reduction Considering Variable Distributed Generation Profiles

Ahmad M. Tahboub, V. Ravikumar Pandi and H. H. Zeineldin

IEEE Transactions on Power Delivery, 30: 1677-1685 (2015) IF: 1.733

In this paper, a new formulation for distribution system reconfiguration (DSR) is proposed for minimizing the annual energy losses considering the variability in active and reactive power demand and distributed generation (DG) profiles. A fuzzy C-means clustering algorithm is used to obtain representative centroids from annual DG and power demand profiles. The DSR study is formulated as a mixed-integer nonlinear programming optimization problem and tested on a 33-bus and an 84-bus system. The minimization is subject to the power balance, bus voltage, and distribution system radiality constraints. Using this formulation, a single optimum configuration that minimizes annual energy losses is found and shown to be different from the optimum configuration, found in previous literature, which focuses on minimizing power losses at peak or average loads. In addition, the prospective advantages of grid automation on DSR are demonstrated to provide further energy loss reduction by including the possibility of interchanging a predefined number of configurations that minimize annual energy losses.

Keywords: Distributed Generation (Dg); Distribution System Reconfiguration; Energy Losses; Fuzzy C-Means Clustering; Genetic Algorithm (Ga); Load Variability.

655. Magnetic Actuator Control of Oil Whip Instability in Bearings

A. S. Dimitri, A. El-Shafei1, A. A. Adly, and J. Mahfoud

IEEE Transactions on Magnetics, 51/11: 85003041-85003044 (2015) IF: 1.386

Magnetic actuators are successfully used in the control of rotating machinery using feedback to eliminate the undesired vibration. Control algorithms can be implemented through the magnetic forces applied using the magnetic actuator, which are controlled through the current induced in the coils. Throughout this paper, we suggest the elimination of the excessive oil whip vibration excited due to the rotation of flexible rotor supported on fluid film bearings using the magnetic forces. The fluid film bearings and magnetic actuators are integrated into one unit. An H8 controller is designed considering the robustness issues to suit a flexible rotor. The controller performance is successfully tested.

Keywords: Magnetic actuators; H control; Oil whip; Magnetic bearings.

656. Dual-Setting Characteristic for Directional Overcurrent Relays Considering Multiple Fault Locations

Khaled Ahmed Saleh, Hatem Hussein Zeineldin, Amer Al-Hinai and Ehab F. El-Saadany

IET Generation, Transmission and Distribution, 9: 1332-1340 (2015) IF: 1.353

Optimal relay settings are determined where coordination constraints are modelled considering only either one fault location (near end or midpoint) or two fault locations (near and far end) on a feeder. This study, first, investigates whether considering one or two fault locations is sufficient to guarantee proper coordination for faults at all other locations on a feeder.

The results show that violations, in the coordination constraints, can occur at various points along the feeder if the relays are coordinated considering one or two fault locations. In addition, considering multiple fault locations while determining the optimal relay setting can avoid such problem but on the expense of the overall relay tripping time. Thus, a dual-setting characteristic for directional overcurrent relays (DOCRs) is proposed instead of the conventional inverse time-current characteristic. The study is conducted on the power transmission system of IEEE 24-bus and the power distribution system of IEEE 14-bus. The proposed characteristic achieves notable reduction in total DOCRs operating time over the conventional characteristic for both test systems while achieving proper coordination across a broader range of possible fault locations.

657. Improving Underground Power Distribution Capacity Using Artificial Backfill Materials

Ossama E. Gouda and Adel Zein El Dein

IET Generation, Transmission and Distribution, 1: 1-8 (2015) IF: 1.353

A system of underground distribution cables is usually used to carry electrical energy inside the populated areas. Under loading and faulty conditions back-fill soils lose their moisture content around underground distribution cables.

This phenomenon forms dry area around the underground cables and leads to the increase of thermal resistance of back-fill soil and sequentially decreases in the cable rating.

One aim of this study is to determine the most appropriate of the artificial soil that can be used to fill the blanks around the underground distribution cables to minimize the effect of dry zones that cause thermal failure to the cable insulation. The results of the experimental works conducted in this study showed that some soils lose moisture faster than the other; hence in these types of the soil the dry area will be formed around theunderground cable faster than the others

Keywords: Underground distribution cables; Backfill soils -dry zone; Maximum current .

658. A New Protection Scheme Considering Fault Ride Through Requirements for Transmission Level Interconnected Wind Parks

Khaled A. Saleh, Mohamed Shawky El Moursi and Hatem H. Zeineldin

New grid codes impose fault ride through (FRT) requirements on large doubly fed induction generator (DFIG)-based wind parks connected to transmission systems in order to reduce the loss of huge generation power due to temporary faults. Recently, the focus is set toward the development of different wind turbine technologies to enhance the FRT capability of wind parks with no consideration for transmission system protection schemes. This paper proposes a new communication-based dual time-current-voltage (Dual-TCV) tripping characteristic for directional overcurrent relays (DOCRs) that considers the FRT capability of wind parks by taking fast fault isolation actions in transmission systems. The protection coordination problem is formulated and solved to determine the optimal relay tripping settings. The proposed approach is tested on the IEEE 24-bus transmission system with up to eight DFIG-based wind parks. The outcome of this study reveals that protection schemes based on DOCRs governed by the proposed Dual-TCV tripping characteristic ensures fast fault isolations that significantly enhances the FRT operation of wind parks in adherence to grid code requirements. The transient analysis verifies the superior performance of the proposed protection approach in enhancing the FRT operation of wind parks.

Keywords: Directional overcurrent relay (Docr); Fault ride through (Frt); Protection coordination; Tripping characteristic.

659. Model Predictive Control of Two-Area Load Frequency Control Based Imperialist Competitive Algorithm

M. Elsisi, M. A. S. Aboelela, M. Soliman and W. Mansour

Imperialist Competitive Algorithm (ICA) has recently been explored to develop a novel algorithm for distributed optimization and control. This paper proposes a Model Predictive Control (MPC) of Load Frequency Control (LFC) based ICA to enhance the damping of oscillations in a two-area power system. A two-area non-reheat thermal system is considered to be equipped with Model Predictive Control (MPC). ICA is utilized to search for optimal controller parameters by minimizing a time-domain based objective function. The performance of the proposed controller has been evaluated with the performance of the conventional PI controller, and PI controller tuned by ICA in order to demonstrate the superior efficiency of the proposed MPC tuned by ICA. Simulation results emphasis on the better performance of the optimized MPC based on ICA in compare to optimized PI controller based on ICA and conventional one over wide range of operating conditions, and system parameters variations.

Keywords: Imperialist competitive algorithm; Load frequency control; Model predictive control.

660. ABC Based Design of PID Controller for Two Area Load Frequency Control With Nonlinearities

M. Elsisi, M. Soliman, M. A. S. Aboelela and W. Mansour

This paper presents an application of the Artificial Bee Colony (ABC) to optimize the parameters of Proportional-Integral-Derivative controller (PID) of nonlinear Load Frequency Controller (LFC) for a power system. A two area non reheat thermal system is equipped with PID controller. ABC is employed to search for optimal controller parameters to minimize the time domain objective function. The performance of the proposed technique has been evaluated with the performance of the conventional Ziegler Nichols (ZN), Genetic Algorithm (GA) and Bacterial Foraging Optimization Algorithm (BFOA) in order to demonstrate the superior efficiency of the proposed ABC in tuning PID controller. By comparison with the conventional technique, GA and BFOA, the effectiveness of the proposed ABC is validated over different operating conditions, and system parameters variations.

Keywords: LFC; PID; Power system control; Artificial bee colony.

661. Dual Proportional Integral Controller of Two-Area Load Frequency Control Based Gravitational Search Algorithm

M. Elsisi, M. Soliman, M. A. S. Aboelela and W. Mansour

Gravitational Search Algorithm (GSA) has recently been explored to develop a novel algorithm for distributed optimization and control. This paper proposes a dual Proportional Integral (PI) controller of Load Frequency Control (LFC) based GSA to enhance the damping of oscillations in a two-area power system. A two-area non-reheat thermal system is considered to be equipped with dual PI controller. GSA is utilized to search for optimal controller parameters by minimizing a time-domain based objective function. The performance of the proposed controller has been evaluated with the performance of the conventional PI controller, and PI controller tuned by GSA in order to demonstrate the superior efficiency of the proposed dual PI controller tuned by GSA. Simulation results emphasis on the better performance of the optimized dual PI controller based on GSA in compare to optimized PI controller based on GSA and conventional one over wide range of operating conditions, and system parameters variations.

Keywords: Gravitational search algorithm; Load frequency control; Dual PI controller.

662. Artificial Intelligence Solution for Incipient Faults Diagnosis of Oil-Filled Power Transformers

Mostafa. M. Ibrahim, M.M. Sayed and E.E.Abu El-Zahab

Power transformers are high cost important equipment used in the transmission and distribution of the electric energy. A power

transformer in operation is subjected to different stresses such as electrical stress and thermal stress due to natural ageing and loading regime which lead to liberation of gases from the hydrocarbon mineral oil. Dissolved gas analysis (DGA) has been widely used as an effective technique to detect the incipient fault of the transformer. There are different conventional DGA methods developed for analyzing these gases such as key Gas, Rogers Ratio, Doernenburg, International Electrotechnical Commission (IEC) Ratio, and Duval triangle. Artificial Intelligence (AI) can be also used to detect power transformers incipient faults. In this paper, the applications of two AI approaches have been presented based on IEC standard which is fuzzy logic approach (FLA) and artificial neural network approach (ANNA). Each approach is used to get the correct diagnosis of the incipient faults and the accuracy is then calculated.
Keywords: Dissolved gas analysis; Fuzzy logic; Neural network; power transformer incipient faults; Transformer oil.

663. Maximization of Wind Energy Conversion Using Sliding Mode Control Tuned by Linearized Biogeography-Based Optimization

Tarek A. Boghdady and Mahmoud M. Sayed

A sliding mode controller is applied in this paper to control a grid-connected Doubly Fed Induction Generator (DFIG) wind turbine for maximization the wind energy conversion and hence reducing the generator losses, the sliding mode controller is a nonlinear controller that implemented here with two Proportional Integral Derivative (PID) controllers, PID controller is a commonly used controller in many industrial applications, while PID controller parameter tuning is a challenging issue which had been done here using a new version of Biogeography-Based Optimization (BBO) which is called Linearized Biogeography-Based Optimization (LBBO) algorithm. BBO is one of the latest evolutionary optimization algorithm based on mathematical model of Biogeography; it permits recombination among candidate solutions (habitats) by migration and immigration also a mutation process is being used. The objective function to be minimized is chosen to be the overall copper losses of the DFIG using MATLAB/SIMULINK. The simulation results are compared with Tyreus–Luyben tuning method, Genetic Algorithm (GA), and Biogeography-Based Optimization (BBO). Simulation results shows that the LBBO is an effective tuning method and has better performance compared with GA, and BBO.
Keywords: Biogeography-based optimization (Bbo); Evolutionary algorithm (Ea); Pid Control; Sliding Mode Control.

664. Comparative Study of Maximum Power Point Tracking Methods for Photovoltaic System

M.R.Zekry, M.M.Sayed and Hosam K.M. Youssef

Maximum Power Point Tracking (MPPT) is one of the important part of photovoltaic system, which the output power and efficiency of photovoltaic system. A comparative study between perturb and observe (P&O) based on PID controller and incremental conductance (IC) base on PID controller verified in this paper. To verify the response of the MPPT methods under changing solar irradiance and temperature a simulation have been established by MATLAB/Simulink. Experimental study was established to test the response of both algorithms to solar radiation changes, also to compare between to the two algorithms.
Keywords: Photovoltaic system; Mppt algorithm; Incremental conductance; Perturbs; Observe pid controller.

665. A Proposed Coordination Strategy for Meshed Distribution Systems With DG Considering User-Defined Characteristics of Directional Inverse Time Overcurrent Relays

Hebatallah Mohamed Sharaf, H.H. Zeineldin, Doaa Khalil Ibrahim and Essam EL-Din Abou EL-Zahab

In this paper, coordination strategy that considers using user defined characteristics for the inverse time overcurrent relays is proposed. Typically, the coordination between relays operating times within meshed systems are achieved by adjusting two relay settings; pick up current and time multiplier setting (TDS and Ip). The equation that models the digital inverse time overcurrent relay operation has two constants; one of them represents the constant for relay characteristics (A) and the other one represents the inverse time type (B). The proposed coordination strategy considers the two relay characteristics constants as continuous variable settings that can be adjusted. These (A and B) values are chosen optimally in addition to (TDS and Ip) to achieve coordination. The coordination problem is formulated as a nonlinear programming problem where the main objective is to minimize the overall time of operation of relays during primary and backup operation considering faults at different locations. The results are compared against the relay coordination using the conventional settings. The problem is applied to the meshed power distribution network of the IEEE 30 bus systems equipped with synchronous based DGs. The results show that the proposed strategy can significantly reduce the overall relay operating time and thus making it an attractive option for meshed distribution systems with DG.
Keywords: Directional inverse time overcurrent relays; Distributed generation; Relays coordination; Relays tripping settings.

Dept. of Electronics and Communication Engineering

666. On the Degrees of Freedom of the Two-Cell Two-Hop Mimo Network with Dedicated and Shared Relays

Ahmed S. Zamzam, Amr El-Keyi, Mohammed Nafie and Yahya Mohasseb

We investigate the degrees of freedom (DoF) of the downlink of a cellular relay network. In this network, two base stations transmit to two mobile stations via relays due to the absence of a direct communication link. Each base station and mobile station is equipped with M antennas. Each base station has two

messages; one to each mobile station, and uses two relays to transmit to the mobile stations. The relays are half duplex, decode-and-forward and equipped with N antennas each. We consider two configurations of the relays; shared and dedicated relays. In the shared relays configuration, the system has two relays that are used by both base stations. Whereas, in the dedicated relays configuration, each base station has two dedicated relays, i.e., the system has four relays. We consider all possible relaying schemes where the base stations can use the relays either simultaneously or alternately. We derive an upper bound on the DoF achievable by each relaying scheme as a function of the ratio between N and M. Furthermore, we propose an achievable scheme that uses interference alignment to achieve the upper bound on the DoF for the shared relays configuration, and for all values of M and N except for $1 <;frac\{N\}\{M\} <;frac\{5\}\{2\}$ in the dedicated relays configuration.

Keywords: Mimo communication; Cellular radio; Decode and forward communication; Radio frequency interference.

667. Cognitive Radio Networks with Probabilistic Relaying: Stable Throughput and Delay Tradeoffs

Mahmoud Ashour and Amr A. El-Sherif

This paper studies fundamental throughput and delay tradeoffs in cognitive radio systems with cooperative secondary users. We focus on randomized cooperative policies, whereby the secondary user (SU) serves either its own queue or the primary users (PU) relayed packets queue with certain service probability. The proposed policy opens room for trading the PU delay for enhanced SU delay, and vice versa, depending on the application QoS requirements. Towards this objective, the system's stable throughput region is characterized. Furthermore, the moment generating function approach is employed and generalized for our system to derive closed-form expressions for the average packet delay for both users. The accuracy of these expressions is validated through simulations. Analytical and simulation results reveal that the service probability can steer the system into prioritizing PU's traffic at the expense of SU's QoS, or vice versa, independently from the admission probability. Alternatively, the ability of the admission probability to control the throughput and delay at the PU or the SU depends on the selected value for the service probability as well as the channel conditions. Finally, it is shown how the service and admission probabilities could be used to achieve the desired QoS level to both PU and SU.

Keywords: Cognitive relaying; Moment generating function; Stable throughput region, Average delay simulations.

668. Analytical Synthesis of Voltage-Mode Even/Odd-Nth-Order Differential Difference Current Conveyor and Fully Differential Current Conveyor

Chun-Ming Chang, M. N. S. Swamy and Ahmed M. Soliman

A complete definition of an odd/even-nth-order notch or band-reject filter transfer function is presented. Based on the differences between the input voltage and (i) an nth-order high-pass; (ii) a traditional nth-order notch; and (iii) an nth-order all-pass filtering transfer function, a systematicmethod has been proposed to derive a universal filter structure that can realize voltage-mode odd/even-nth-order low-pass, band-pass, high-pass, all-pass and traditional notch filters. The intrinsic capability of voltage-mode addition and subtraction of the two active elements, differential difference current conveyors and fully differential current conveyors, is used to advantage in the aforementioned synthesis procedure. Based upon the definition of an nth-order notch or band-reject filter transfer function proposed in this paper, the aforementioned universal one has been further extended to the newly defined nth-order band rejection filter. The voltage and current tracking errors of the two active elements are compensated by varying the resistances of the proposed filter. Filtering feasibility, stability, component sensitivities, linear and dynamic ranges, power consumption, and noise are simulated using H-Spice with 0.35 µm process. Compared to some of the recently reported universal biquads, the new one is shown to enjoy the lowest component sensitivities and the best output accuracy for all-pass signals. Moreover, Monte Carlo and two-tone tests for intermodulation linearity simulations are also investigated.

Keywords: Filters; Active filters; Low-pass Filters; Band-pass filters; High-pass filters; Band-reject filters.

669. Cooperative Q-Learning Techniques for Distributed Online Power Allocation in Femtocell Networks

Hussein Saad, Amr Mohamed and Tamer ElBatt

In this paper, we address the problem of distributed interference management of femtocells that share the same frequency band with macrocells using distributed multi-agent Q-learning. We formulate and solve two problems representing two different Q-learning algorithms, namely, femto-based distributed and sub-carrier-based distributed power controls using Q-learning (FBDPC-Q and SBDPC-Q). FBDPC-Q is a multi-agent algorithm that works on a global basis, for example, deals with the aggregate macrocell and femtocell capacities. Its complexity increases exponentially with the number of sub-carriers in the system. Also, it does not take into consideration the sub-carrier macrocell capacity as a constraint. To overcome these problems, SBDPC-Q is proposed, which is a multi-agent algorithm that works on a sub-carrier basis, for example, sub-carrier macrocell and femtocell capacities. Each of FBDPC-Q and SBDPC-Q works in three different learning paradigms: independent (IL), cooperative (CL), and weighted cooperative (WCL). IL is considered the simplest form for applying Q-learning in multi-agent scenarios, where all the femtocells learn independently. CL and WCL are the proposed schemes in which femtocells share partial information during the learning process in order to strike a balance between practical relevance and performance. We prove the convergence of the CL paradigm when used in the FBDPC-Q algorithm.We show via simulations that the CL paradigm outperforms the IL paradigm in terms of the aggregate femtocell capacity, especially in networks with large number of femtocells

and large number of power levels. In addition, we propose WCL to address the CL limitations. Finally, we evaluate the robustness and scalability of both FBDPC-Q and SBDPC-Q, against several typical dynamics of plausible wireless scenarios (fading, path loss, random activity of femtocells, etc.). We show that the CL paradigm is the most scalable to large number of femtocells and robust to the network dynamics compared with the IL and WCL paradigms.

Keywords: Distributed power control; Femtocell networks; Multi-agent q-Learning.

670. Process Variability-Induced Noc Link Failure: A Probabilistic Model

Eman Kamel Gawish, M.Watheq El-Kharashi and M.F.Abu-Elyazeed

Microelectronics Journal, 46: 248-257 (2015) IF: 0.836

As technology scales down, the amount of process variations increases causing Networks-on-Chip (NoC) links, designed to be identical, to have current and delay variations. Thus, some links may fail to meet design timing or power constraints. Using current and delay variations with design constraints, we estimate link failure probability across NoC links. Modeling results show that the average NoC link failure probability across a 4×4 mesh reaches 3.3% for voltage mode (VM) links and 3.7% for current mode (CM) links at 32 nm. The average NoC link failure probability also increases as the supply voltage decreases or the operating frequency increases. As NoC mesh size scales from 4×4 to 8×8, the link failure probability doubles to 8% for VM links at 22 nm. Topology evaluation shows that for small NoC size, the grid topology outperforms the tree one with lower amount of variation. On the other hand, for relatively large NoC sizes, the hierarchical tree and ring topologies outperform the grid topology with lower amount of variations across the links.

Keywords: Current mode interconnect; Networks-on-chip (NoC); NoC topologies; Process variations; Voltage mode interconnect.

671. An All-Digital Semi-Blind Clock and Data Recovery System

Mina Abdallah, Ahmed Eladawy and Ahmed Mohieldin

Microelectronics Journal, 46: 273-284 (2015) IF: 0.836

This paper presents a digitally intensive semi-blind clock and data recovery (SBCDR) system. The paper covers the theory, analysis, and system level simulation of this SBCDR. The proposed CDR is tailored to target the optical network standard OC-192. The SBCDR can provide the required jitter tolerance (JTo), and still provide enough jitter filtering to achieve the jitter transfer (JTr) requirements. Also, the recovered clock achieves a low jitter generation (JG) of 0.01 UIrms and 0.0064 UIrms for both the wide-band and high-band jitter filters defined by the standard. The proposed SBCDR provides two advantages over typical SBCDRs and PLL-based CRDs that target OC-192. First, the digitally intensive nature provides a scalable and process tolerant design. Second, the architecture provides a CDR that can pass all three jitter performance metrics, without the aid of an external clean-up phase locked loop (PLL) or a high performance clock multiplication unit (CMU) typically required by OC-192 transceivers. By utilizing a circular representation for the phase

calculation in the over-sampling clock and data recovery (OSCDR), extensive pipe-lining in the implementation and higher data rate tolerance can be achieved. The simulation results of the proposed SBCRD agree closely with theoretical results.

Keywords: CDR; Adpll; OC-192; Jitter.

672. An Intelligent Technique for Generating Equivalent Gyrator Circuits

Nariman A. Khalil, Rania F. Ahmed, Rania A. Abulseoud and Ahmed M. Soliman

Microelectronics Journal, 46: 1060-1068 (2015) IF: 0.836

Genetic algorithm (GA) applications in analog design circuits play an important role with promising results. This algorithm is utilized to generate equivalent circuits for the well-known gyrator circuit which is the most commonly used active circuit for the realization of a grounded inductor. The conventional gyrator circuit is realized by the op-amp which has the drawback of frequency limitations. This paper introduces the gyrator -GA Technique. It is an intelligent technique for generating equivalent gyrator circuits utilizing Second Generation Current Conveyor (CCII) as well as Transconductance Amplifier (TA) circuits. The proposed algorithm is based on the pathological representation of the active blocks. As illustrations to demonstrate the systematic realization of gyrator-GA, a fifth-order Butterworth lowpass filter is designed and simulated using PSPICE.

Keywords: Gyrator; Nullor; Pathological element; Genetic algorithm; Ccii circuits; TA circuits.

673. Effective Area Spectral Efficiency for Wireless Communication Networks with Interference Management

Aymen Omri, Mazen O. Hasna and Mohammed Nafie

Eurasip Journal on Wireless Communications and Networking, (2015) IF: 0.724

In this paper, we introduce a new metric, namely, effective area spectral efficiency (EASE), to quantify the spectral efficiency as well as the spatial properties of point-to-point transmission systems and decode and forward (DF) relaying communications networks with interference management. For each transmission mode, we derive a closed-form expression for the maximum transmission range under Rayleigh fading environment. Based on the maximum transmission range, we define and derive the average affected area and the average ergodic capacity. We then introduce the EASE expression to quantify the spatial spectral utilization efficiency. For DF relaying, the EASE metric is based on a newly introduced index, namely, source relay communication index (SRCndx). SRCndx is used to validate the communication possibility between a source and a relay for given transmission parameters in a given environment and provides information about the necessity of using relaying communications. Through mathematical analysis and numerical examples, we show that the EASE metric provides a new perspective on the design of wireless transmissions, especially the transmission power selection process.

Keywords: Affected area; Link reliability; Spectral efficiency; Wireless communication Networks.

674. Average Symbol Error Rate and Ergodic Capacity of Switch-and-Examine Combining Diversity Receivers Over the *α-µ* Fading Channel

Refaat Mohamed; Mahmoud H. Ismail and Hebat-Allah M. Mourad

In this paper, we consider a switch-and-examine combining (SEC) diversity scheme operating over independent and identically distributed (i.i.d) branches assuming an *a*-µ fading channel. We derive expressions for the average symbol error rate (ASER) for a class of coherent modulation techniques considering this fading model as well as expressions for the ergodic capacity under the same assumptions. The results for the ASER and the ergodic capacity are shown to reduce to those previously reported in the literature for other channel models such as the Weibull model as a special case, which confirms the validity of the obtained expressions. Different aspects are studied including the effect of fading severity, the number of branches and the modulation scheme used. Also, insights on the optimal choice of the switching threshold are provided.

Keywords: Diversity receivers; A-M fading; Switch-And-examine combining; Average symbol error rate; Ergodic capacity.

675. Standardization of Cognitive Radio Networking: A Comprehensive Survey

Ahmed Khattab and Magdy A. Bayoumi

Cognitive radio networking has recently presented itself as a key technology to alleviate the severe spectrum underutilization and provide a solution for spectrum scarcity. Cognitive radio networks (CRNs) are foreseen as the future wireless information and communications technologies (ICT) that exploit dynamic spectrum access (DSA) strategies to provide wireless connectivity. The enabling component of CRNs and DSA is the cognitive radio (CR). A CR is a wireless device that senses the surrounding radio environment and opportunistically accesses the unutilized spectrum bands based on the activities of the surrounding primary licensed networks. In this paper, we provide a comprehensive survey of the recent and ongoing standardization activities of the different ICT standardization bodies related to CRN and DSA systems. Unlike existing literature, our comprehensive study covers the standardization efforts of the different involved standardization bodies all over the globe. We classify such standards into TV white space standards and coexistence standards. We also discuss the standards developed to incorporate CRN and DSA concepts to existing wireless technologies.

Keywords: Cognitive radio; Cognitive radio Networks; Software-defined radio; Dynamic spectrum access; Standardization.

676. High Accuracy GPS-Free Vehicle Localization Framework Via An Ins-Assisted Single Rsu

Ahmed Khattab, Yasmine A. Fahmy and Ahmed AbdelWahab

Collision avoidance and road safety applications require highly accurate vehicle localization techniques. Unfortunately, the existing localization techniques are not suitable for road safety applications as they rely on the error-prone Global Positioning System (GPS). Likewise, cooperative localization techniques that use intervehicle communications experience high errors due to hidden vehicles and the limited sensing/communication range. Recently, GPS-free localization based on vehicle communication with a low cost infrastructure installed on the roadsides has emerged as a more accurate alternative. However, existing techniques require the vehicle to communicate with two roadside units (RSUs) in order to achieve high localization accuracy. In contrast, this paper presents a GPS-free localization framework that uses two-way time of arrival to locate the vehicles based on communication with a single RSU. Furthermore, our framework uses the vehicle kinematics information obtained via the vehicle's onboard inertial navigation system (INS) to further improve the accuracy of the vehicle location using Kalman filters. Our results show that the localization error of the proposed framework is as low as 1.8 meters. The resulting localization accuracy is up to 65% and 47.5% better than GPS-based techniques used without/with INS, respectively. This accuracy gain becomes around 73.3% when compared to existing RSU-based techniques.

Keywords: Localization; Roadside unit; Dead reckoning; GPS-Freel.

677. Optimized Joint Power and Resource Allocation for Coordinated Multi-Point Transmission for Multi-User Lte-Advanced Systems

Rana A. Abdelaal, Khaled M. F. Elsayed and Mahmoud H. Ismail

Recent research has shown that coordinated multi-point (CoMP) transmission can provide significant gains in terms of the overall throughput of cellular systems. The main purpose of this paper is to enhance the overall cell throughput and to optimize the power consumption in LTE-Advanced systems using CoMP. In particular, we present joint resource allocation, precoding and power allocation (PA) algorithms based on the signal-to-leakage-plus-noise-ratio (SLNR) for the CoMP downlink. The proposed resource allocation and precoding algorithm selects the user equipment that can efficiently share the same resource block in the same cell without degrading the overall throughput by using the SLNR metric. This sharing is possible due to the existence of multiple transmitters within a cell in a CoMP setting. Additionally, we propose a set of PA algorithms that significantly improve the overall throughput and reduce the power consumption. The PA algorithms are based on solving a set of constrained convex optimization problems using the log-barrier penalty function approach based on the Newton method. We evaluate the proposed PA algorithms by comparing them to the iterative water-filling (IWF) algorithm. Performance evaluation results show that the proposed SLNR-based PA algorithms

provide considerable performance gains in terms of the overall system throughput and are also shown to have even less power consumption compared to the IWF.

Keywords: Power allocation; Resource allocation; Precoding; Coordinated multi-point; Interference mitigation; Newton'S method.

678. Omnifont Text Recognition of Printed Cursive Scripts Via Hmms, Compact Lossless Features, and Soft Data Clustering

Mohsen Abdelrazik Ali Rashwan

Pattern Anal Applic, 18: 507-521 (2015) IF: 0.646

This paper presents an optical character/text recognition (OCR) system for cursive scripts like those of Arabic, Urdu, Persian, Kurdish, etc. This OCR system is a large-scale one in the sense of architecture, training data size, and state-of-the-art performance. The paper introduces the theoretical derivation and experimental assessment of our two main contributions deployed in this OCR. The first contribution is the design of a new autonomously normalized, lossless, and compact feature vector that enables the production of a truly robust omnifont OCR system for cursive scripts with an ASR-like HMM-based architecture. Half of the components in this feature vector are analogs and the other half are discrete, which obstructs the use of continuous Gaussian mixtures to model an aggregate of such features and mandates the use of discrete HMMs instead, which in turn necessitates the deployment of vector clustering and quantization. The second contribution is a new soft (i.e., probabilistic) vector quantization (VQ) scheme, as opposed to conventional hard-deciding VQ that we analytically derive and then deploy to alleviate overfitting and boost the robustness of our OCR against different kinds of obtrusive variances. We present experimental evidence of these benefits of the presented soft VQ scheme to our OCR. Other machine-learning systems with VQ modules may also deploy soft VQ to obtain the same benefits.

Keywords: Arabic OCR; ASR-like; Cursive scripts; Feature vectors; HMM; Machine learning; Omnifont; Overfitting; Pattern recognition; Quantization noise; Soft data clustering.

679. Optimum Pid Tuning Using Modified Artificial Bee Colony Algorithm

Nasr A. Elkhateeb and R. I. Badr

Mediterranean Journal of Measurement and Control, 11: 425-429 (2015)

Swarm intelligence has become a research interest to many research scientists of related fields in recent years. Artificial Bee Colony (ABC) is one of the most recently evolutionary computation algorithms inspired by the social behavior of honey bees. Artificial Bee Colony has limitations due to its stochastic searching characteristic and complex computation that result in slow convergence to the global optimum solution. In this paper, two efficient modifications have been applied to the classical ABC; an efficient dynamic inertia weight based method is introduced to improve the performance of the classical ABC algorithm by controlling the effect of the initial population in the new expected solution which leads improvement in the convergence rate of ABC. Secondly, the convergence rate of

ABC has been improved by guiding the bees towards the best food sources (global solution) which is called (Elite-ABC). The performance of the modified algorithm is compared with the classical ABC in the tuning of (PID) controller. The considered plants have different orders and time delays are controlled by PID controller with optimum gains. Simulation results show that the modified ABC algorithms achieve faster convergence rate and optimum PID parameters.

Keywords: Swarm intelligent; Artificial bee colony; Pid controller; Evolutionary algorithms.

680. Model Reference Adaptive PID Controller for Unstable Siso Systems

R. A Fahmy, R . I . Badr and F. A Rahman

The Mediterranean Journal of Measurement and Control, 11: 438-443 (2015)

The Proportional-Integral-Derivative (PID) is widely used in industrial control systems due to its simplicity. For Single-Input Single-Output (SISO) systems, choosing the PID gain values is a difficult task especially that in most applications systems parameter variations and changes in operating conditions occur. Thus, there is necessity to find parameters tuning method in which PID gains should be adapted to handle such changes. This paper is concerned with the design of an Adaptive PID (APID) controller in which Recursive Least Square (RLS) algorithm is used as adaptation mechanism. Meaning that RLS algorithm is used to tune the PID gains online forcing the system to behave like a desired reference model. Since stability is a vital issue in the evaluation of control systems, therefore stability analysis of the proposed technique is developed. Controlling the temperature of Fluidized Bed Reactor (FBR) system is used as an example of an unstable SISO system to examine the effectiveness of the proposed APID controller. Computer simulations show the superiority of the proposed APID controller over the conventional fixed gains PID controller in stabilizing the system and tracking the setpoint changes even when some variations in the system parameters occur.

Keywords: Adaptive control; Proportional-integral-derivative (PID); Recursive least square (RLS) algorithm;Unstable SISO system; Stability analysis.

681. Deep Learning Framework With Confused Sub-Set Resolution Architecture for Automatic Arabic Diacritization

Mohsen A. A. Rashwan, Ahmad A. Al Sallab, Hazem M. Raafat and Ahmed Rafea

IEEE/ACM Transactions on Audio, Speech, and Language Processing, 23: 505-5016 (2015)

The Arabic language belongs to a group of languages that require diacritization over their characters. Modern Standard Arabic (MSA) transcripts omit the diacritics, which are essential for many machine learning tasks like Text-To-Speech (TTS) systems. In this work Arabic diacritics restoration is tackled under a deep learning framework that includes the Confused Sub-set Resolution (CSR) method to improve the classification accuracy, in addition to an Arabic Part-of-Speech (PoS) tagging framework using deep neural nets. Special focus is given to syntactic

diacritization, which still suffers low accuracy as indicated in prior works. Evaluation is done versus state-of-the-art systems reported in literature, with quite challenging datasets collected from different domains. Standard datasets like the LDC Arabic Tree Bank are used in addition to custom ones we have made available online to allow other researchers to replicate these results. Results show significant improvement of the proposed techniques over other approaches, reducing the syntactic classification error to 9.9% and morphological classification error to 3% compared to 12.7% and 3.8% of the best reported results in literature, improving the error by 22% over the best reported systems.

Keywords: Arabic diacritization; Classifier design; Deep networks; Part-of-speech (PoS) tagging.

682. Performance Evaluation and Design Optimization for Flexible Multiple Instruction Multiple Data Elliptic Curve Cryptography Crypto Architecture

Esmaeil, Amini, Zahra Jeddi, Ahmed Khattab and Madgy Bayoumi

Journal of Low Power Electronics, 11: 1-15 (2015)

The parallelism and granularity of a Multiple Instruction Multiple Data (MIMD) crypto architecture is evaluated in this paper, with a flexible and efficient implementation of scalar point multiplication over $GF(2^m)$ operands. Unlike the related implementations in the literature that do not combine all such features, the studied MIMD architecture in this paper is modular, scalable, supports arbitrary operand sizes, and is capable of handling different parallel operations. An exhaustive simulation-based study of the different system-level performance aspects of this architecture is studied under several input data patterns. Simulation results reveal how such a flexible architecture significantly increases the level of parallelism, and hence, the utilization and throughput at a slight cost of increased area for the task controllers. Results also confirm the superior timing characteristics of the MIMD as compared to other existing architectures. Furthermore, the impact of different scheduling schemes on the performance of the MIMD architecture is investigated. A simulation tool is developed to allow the designer not only to visualize and evaluate the behavior of the MIMD architecture, but also to obtain the parameters of the architecture that achieves the optimal degree of parallelism as well as granularity without compromising area, power, and timing performances.

Keywords: Elliptic curve cryptography; Multiple instruction multiple-data; Design optimization tool; Performance evaluation.

Dept. of Engineering Mathematics and Physics

683. Temperature Equation for Compressible Polymeric Fluids

Amr Guaily

Polymer, 77: 305-311 (2015) IF: 3.562

A temperature equation accounting for the compressibility as well as the elasticity of polymeric fluids is derived using the Massieu thermodynamic potential. The constitutive model is completed by adopting the Tait equation relating the thermodynamic pressure to the specific volume and the temperature. A Lagrangian numerical technique is used to study the behavior of the proposed model under different types of loading conditions against published models with an apparent degree of success.

Keywords: Polymeric fluids; Temperature equation; Compressibility and Elasticity.

684. Tunability of Two Dimensional N-Doped Semiconductor Photonic Crystals Based on the Faraday Effect

Arafa H Aly, Sahar A El-Naggar and Hussein A Elsayed

Optics Express, 23: 15038-15046 (2015) IF: 3.488

In this paper, we theoretically investigate the effect of an external magnetic field on the properties of photonic band structures in twodimensional n-doped semiconductor photonic crystals. We used the frequency-dependent plane wave expansion method. The numerical results reveal that the external magnetic field has a significant effect on the permittivity of the semiconductor materials. Therefore, the photonic band structures can be strongly tuned and controlled. The proposed structure is a good candidate for many applications, including filters, switches, and modulators in optoelectronics and microwave devices.

Keywords:Photoniccrystals; Semiconductor materials; Nanophotonics and Photonic crystals.

685. A Performance-Oriented Power Transformer Design Methodology Using Multi-Objective Evolutionary Optimization

Amr A. Adly and Salwa K. Abd-El-Hafiz

Journal of Advanced Research, 6: 417-423 (2015) IF: 3

Transformers are regarded as crucial components in power systems. Due to market globalization, power transformer manufacturers are facing an increasingly competitive environment that mandates the adoption of design strategies yielding better performance at lower costs. In this paper, a power transformer design methodology using multi-objective evolutionary optimization is proposed. Using this methodology, which is tailored to be target performance design-oriented, quick rough estimation of transformer design specifics may be inferred. Testing of the suggested approach revealed significant qualitative and quantitative match with measured design and performance values. Details of the proposed methodology as well as sample design results are reported in the paper.

Keywords: Power transformers; Design; Multi-objective evolutionary optimization; Particle swarm optimization.

686. RF Cavity Design Exploiting A New Derivative-Free Trust Region Optimization Approach

Abdel-Karim S.O. Hassan, Hany L. Abdel-Malek, Ahmed S.A. Mohamed, Tamer M. Abuelfadl and Ahmed E. Elqenawy

Journal of Advanced Research, 6: 915-924 (2015) IF: 3

In this article, a novel derivative-free (DF) surrogate-based trust region optimization approach is proposed. In the proposed

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approach, quadratic surrogate models are constructed and successively updated. The generated surrogate model is then optimized instead of the underlined objective function over trust regions. Truncated conjugate gradients are employed to find the optimal point within each trust region. The approach constructs the initial quadratic surrogate model using few data points of order O(n), where n is the number of design variables. The proposedapproach adopts weighted least squares fitting for updating the surrogate model instead of interpolation which is commonly used in DF optimization. This makes the approach more suitable for stochastic optimization and for functions subject to numerical error. The weights are assigned to give more emphasis to points close to the current center point. The accuracy and efficiency of the proposed approach are demonstrated by applying it to a set of classical bench-mark test problems. It is also employed to find the optimal design of RF cavity linear accelerator with a comparison analysis with a recent optimization technique.

Keywords: Optimal design; Derivative-free optimization; Trust region; Quadratic surrogate model; Linear accelerator.

687. Drift Transport Model of Field Effect Transistors in Saturation Beyond Cutoff

Nihal Y Ibrahim, Nadia H Rafat and Salah E A Elnahwy

Journal of Physics D: Applied Physics, 48: 135102-135102 (2015) IF: 2.521

Field effect transistors (FETs) can be used for Terahertz radiation detection beyond cutoff frequencies. Their operation in the linear regime of operation has been sufficiently modeled and analyzed. Unfortunately, this is not the case for FETs operating in the saturation regime. This work expands the (semi-classical) drift current transport theory in FETs beyond the cutoff frequency to present a piece-wise model of nonlinear high frequency rectification in the saturation regime. The saturation regime is divided into three subregimes, each of them has a distinct rectification response function. The transition between them may induce a peaking effect in the overall response function.

Keywords: Field effect transistor; Terahertz detector; Modeling; Drift electron transport; Saturation.

688. Two Dimensional Tunable Photonic Crystals and N Doped Semiconductor Materials

Hussein A. Elsayed, Sahar A. El-Naggar and Arafa H. Aly

Materials Chemistry and Physics, 160: 221-226 (2015) IF: 2.259

In this paper, we theoretically investigate the effect of the doping concentration on the properties of two dimensional semiconductor photonic band structures. We consider two structures; type I(II) that is composed of n doped semiconductor (air) rods arranged into a square lattice of air (n doped semiconductor). We consider three different shapes of rods. Our numerical method is based on the frequency dependent plane wave expansion method. The numerical results show that the photonic band gaps in type II are more sensitive to the changes in the doping concentration than those of type I. In addition, the width of the gap of type II is less sensitive to the shape of the rods than that of type I. Moreover, the cutoff frequency can be strongly tuned by the doping

concentrations. Our structures could be of technical use in optical electronics for semiconductor applications.

Keywords: Dielectric properties; Optical properties; Band-structure; Semiconductors; Interfaces.

689. A New Insight Into the Dipole–Quadrupole and Dipole–Octupole Polarizabilities of CCL₄ From Ab Initio Calculations and Anisotropic Light Scattering Experiment

M.S.A. El-Kader and Y.N. Kaluginaba

Chemical Physics Letters, 639: 93-98 (2015) IF: 1.897

The dipole–quadrupole and dipole–octupole polarizabilities of CCl_4 have been determined from collision-induced light scattering (CILS) spectrum. (Hyper) polarizabilities were calculated at the CCSD (T) level of theory with aug-cc-pVXZ (X = D, T, Q) basis sets. The CILS spectra were analyzed using our new inter-molecular potential and those available in literature. The quality of the present potential was checkedby comparison between calculated and experimental thermophysical and transport properties overa wide temperature range. Our final estimates from experiment for these properties |A|=62.7 a.u.and |E|=423.8 a.u. and the theoretical values of (hyper) polarizabilities calculated at the CCSD(T)/aug-cc-pVQZ level of theory are α = 69.27 a.u., A = 67.15 a.u., E = −203.97 a.u., C = 821.75 a.u., β = 11.88 a.u., and γ = 10 768.6 a.u.

Keywords: Electrical properties; CILS; CCL₄; (Hyper) Polarizabilities.

690. Optimal Design of One-Dimensional Photonic Crystal Filters Using Minimax Optimization Approach

Abdel-Karim S. O. Hassan, Ahmed S. A. Mohamed, Mahmoud M. T. Maghrabi and Nadia H. Rafat

Applied Optics, 54: 1399-1409 (2015) IF: 1.784

In this paper, we introduce a simulation-driven optimization approach for achieving the optimal design of electromagnetic wave (EMW) filters consisting of one-dimensional (1D) multilayer photonic crystal (PC) structures. The PC layers' thicknesses and/or material types are considered as designable parameters. The optimal design problem is formulated as a minimax optimization problem that is entirely solved by making use of readily available software tools. The proposed approach allows for the consideration of problems of higher dimension than usually treated before. In addition, it can proceed starting from bad initial design points. The validity, flexibility, and efficiency of the proposed approach is demonstrated by applying it to obtain the optimal design of two practical examples. The first is SiC/Ag/SiO2N wide bandpass optical filter operating in the visible range. Contrarily, the second example is Ag/SiO2 N EMW low pass spectral filter, working in the infrared range, which is used for enhancing the efficiency of thermophotovoltaic systems. The approach shows a good ability to converge to the optimal solution, for different design specifications, regardless of the starting design point. This ensures that the approach is robust and general enough to be applied for obtaining the optimal design of all 1D photonic crystals promising applications.

Keywords: Photonic crystals; Systems design; Multilayer design; Filters; Photothermal effects.

691. Non-Linear Model for Compression Tests on Articular Cartilage

Alfio Grillo, Amr Guaily, Chiara Giverso and Salvatore Federico

Hydrated soft tissues, such as articular cartilage, are often modeled as biphasic systems with individually incompressible solid and fluid phases, and biphasic models are employed to fit experimental data in order to determine the mechanical and hydraulic properties of the tissues. Two of the most common experimental setups are confined and unconfined compression. Analytical solutions exist for the unconfined case with the linear, isotropic, homogeneous model of articular cartilage, and for the confined case with the non-linear, isotropic, homogeneous model. The aim of this contribution is to provide an easily implementable numerical tool to determine a solution to the governing differential equations of (homogeneous and isotropic) unconfined and (inhomogeneous and isotropic) confined compression under large deformations. The large-deformation governing equations are reduced to equivalent diffusive equations, which are then solved by means of finite difference (FD) methods. The solution strategy proposed here could be used to generate benchmark tests for validating complex user-defined material models within finite element (FE) implementations, and for determining the tissue's mechanical and hydraulic properties from experimental data.
Keywords: Deformation; Fluids; Compression; Cartilage; Stress; Permeability; Biological tissues.

692. Collision-Induced Light Scattering Spectra of Mercury Vapour At Different Temperatures

M.S.A. El-Kader

The two-body isotropic and anisotropic collision-induced light scattering spectra of mercury vapour at different temperatures are analysed in terms of new interatomic potential and interaction-induced pair-polarisability trace and anisotropy models, using quantum line-shape computations. The quality of the present potential has been checked by comparing between calculated and experimental spectroscopic, thermo-physical and transport properties over a wide temperature range, which are found to be in good agreement. Also, the comparison of the computed spectra with ameasurement at different temperatures permits improvements on the existing trace and anisotropy models of the pair polarisability.
Keywords: Cils spectra; Ground-state potential; Spectroscopic; Thermo-physical and transport properties; Mercury.

693. On the Oscillatory Behavior of Solutions of Nonlinear Fractional Differential Equations

Said R.Grace

The study of oscillation theory for fractional differential equations has been initiated by Grace et.al. [14] In this paper we establish some new criteria for the oscillation of fractional differential equations with the Caputo derivative of the form cD(a)(alpha)x(t) = e(t) + f(t,x(t)), a > 1, alpha is an element of(1,2) We also present the conditions under which all solutions of this equation are asymptotic to at + b as t -> infinity for some real numbers a, b. We shall employ a different technique rather than that in [14].
Keywords: Asymptotic behavior; Oscillation; Caputo derivative; Fractional differential equations.

694. Eliminating the Unbounded Behavior of Function Derivative Expansions in Terms of Sinc Bases

Adel A. K. Mohsen

Sinc methods are frequently used in treating mathematical physics problems such as in interpolation, quadrature and solving integral and differential equations. However, for finite intervals the function derivatives become unbounded. This unbounded behavior is addressed. The choice of proper weights and the use of the Sinc expansion of the function $F(x) = x$ are used to provide improved expansions and to eliminate the unbounded behavior of the derivatives at the terminal points.
Keywords: Interpolation; Function derivatives; Sinc expansion; Spectral expansion.

695. Multi-Input Intrinsic and Extrinsic Field Effect Transistor Models Beyond Cutoff Frequency

Nihal Y. Ibrahim, Nadia H. Rafat and Salah E.A. Elnahwy

This work expands the classical theory of operation of FETs beyond cutoff frequency. Using an electron drift transport model, the responsivity of a FET working in the linear region of operation within the semi-classical transport region is derived. Different DC circuit configurations are included in the analysis, as well as multiple AC input signals. Separating the model into intrinsic and extrinsic parts enables better analysis of the effect of multiple input AC signals. A new treatment of the concept of symmetry/asymmetry in FETs beyond the cutoff frequency is presented. The origin of symmetry and factors affecting it are analyzed. The effects of asymmetries from various origins within the FET system are taken into account. The analytical results are used to qualitatively explain published experimental results of symmetry points in FET THz detectors.
Keywords: Field effect transistor; Terahertz detector; Modeling; Drift electron transport; Multiple input; Symmetry.

696. On the Asymptotic Behavior of Positive Solutions of Certain Integral Equations

Said R. Grace

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We present the conditions under which every positive solution x of the integral equation x(t) = a(t) + t c (t - s)a-1k(t, s)f (s, x(s))ds, c > 1, a > 0 satisfies x(t) = O(a(t)) as t 8, i.e., lim sup t8 x(t) a(t) < 8. From the obtained results, we derive a technique which can be applied to some related integral equations that are equivalent to certain fractional differential equations of Caputo derivative of any order.

Keywords: Asymptotic behavior; Positive solution; Caputo derivative; Fractional differential equations.

697. Resistive-Less Memcapacitor-Based Relaxation Oscillator

Mohamed E. Fouda and Ahmed G. Radwan

International Journal of Circuit Theory and Applications, 43: 959-965 (2015) IF: 1.254

Recently, the realization of the conventional relaxation oscillators was introduced based on memristors. This paper validates the concept using two series memcapacitors in general which is applicable for a capacitor and memcapacitor as well. Furthermore, the necessary conditions for oscillation are introduced, and a generalized closed-form expression for the oscillation frequency is derived. Two special cases are introduced and verified using PSPICE simulations showing a perfect matching.

Keywords: Memcapacitor; Mem-element; Oscillator; Resistive-Less oscillator.

698. A Hybrid Model for Biofilm Growth on A Deformable Substratum

Mohammed A. Boraey, Amr Guaily and Marcelo Epstein

The Canadian Journal of Chemical Engineering, 93: 789-797 (2015) IF: 1.231

The mutual interaction between a biofilm growing on a deformable substratum and its deformability is investigated. The interaction process is investigated by a newly developed model based on a hybrid Cellular Automaton/Finite Element approach (CAFE). A quantitative model is proposed that predicts the effect of the substratum deformability on the biofilm growth as well as on the allocation of the newborn cells. In the proposed model, it is suggested that regions of higher positive curvature will act as attractors. The finite element method is used to model the substratum deformability while the biofilm growth is modelled using a semi-stochastic approach. Numerical examples are presented in two- and three-dimensional settings.

Keywords: Café; Biofilm; Deformable substratum; Cellular automaton; Finite Element.

699. Boundary Dynamics of Memcapacitor in Voltage-Excited Circuits and Relaxation Oscillators

Mohammed E. Fouda and Ahmed G. Radwan

Circuits, Systems, and Signal Processing, 34: 2765-2983 (2015) IF: 1.118

This paper discusses the boundary dynamics of the charge-controlled memcapacitor for Joglekar's window function that describes the nonlinearities of the memcapacitor's boundaries. A

closed form solution for the memcapacitance is introduced for general doping factor p. The derived formulas are used to predict the behavior of the memcapacitor under different voltage excitation sources showing a great matching with the circuit simulations. The effect of the doping factor p on the time domain response of the memcapacitor has been studied as compared to the linear model using the proposed formulas. Moreover, the generalized fundamentals such as the saturation time of the memcapacitor are introduced, which play an important role in many control applications. Then the boundary dynamics under sinusoidal excitation are used as a basis to analyze any periodic signal by Fourier series, and the results have been verified using PSPICE simulations showing a great matching. As an application, two configuration of resistive-less memcapacitor-based relaxation oscillators are proposed and closed form expressions for oscillation frequency and conditions for oscillation are derived in presence of nonlinear model. The proposed oscillator is verified using PSPICE simulation showing a perfect matching.

Keywords: Memcapacitor; Mem-elements; Nonlinear model; Memcapacitor dynamics; Circuit modeling; Relaxation oscillator.

700. Fractional Order Sallen-Key and KHN Filters Stability and Pole Allocation,

Ahmed Gomaa Ahmed Radwan

Circuits, Systems, and Signal Processing, 34: 1461-1480 (2015) IF: 1.118

This paper presents the analysis for allocating the system poles and hence controlling the system stability for KHN and Sallen–Key fractional order filters. The stability analysis and stability contours for two different fractional order transfer functions with two different fractional order elements are presented. The effect of the transfer function parameters on the singularities of the system is demonstrated where the number of poles becomes dependent on the transfer function parameters as well as the fractional orders. Numerical, circuit simulation, and experimental work are used in the design to test the proposed stability contours.

Keywords: Stability; Lti system; Fractional-order System; Filters; Oscillators; Control.

701. Fractional-Order Memristor Response Under Dc and Periodic Signals

Mohamed E. Fouda and Ahmed G. Radwan

Circuits, Systems, and Signal Processing, 34: 961-970 (2015) IF: 1.118

Recently, there is an essential demand to extend the fundamentals of the conventional circuit theory to include the new generalized elements, fractional-order elements, and mem-elements due to their unique properties. This paper presents the relationships between seven different elements based on the four physical quantities and the fractional-order derivatives. One of them is the Fractional-order memristor, where the memristor dynamic is expressed by fractional-order derivative. This element merge the memristive and fractional-order concepts together where the conventional modeling becomes a special case. Moreover, the mathematical modeling of the fractional-order memristor is introduced. In addition, the response of applying DC, sinusoidal,

and nonsinusoidal periodic signals is discussed. Finally, different numerical simulations are presented.

Keywords: Fractional-order elements; Constant phase elements; Memristor; Mem-element; Nonlinear circuits; Memristive circuits.

702. Neuron Model with Simplified Memristive Ionic Channels

Almoatazbellah M. Hegab, Noha M. Salem and Ahmed G. Radwan

International Journal of Bifurcation and Chaos, 25: 1530017-1530028 (2015) IF: 1.078

A simplified neuron model is introduced to mimic the action potential generated by the famous Hodgkin–Huxley equations by using the genetic optimization algorithm. Comparison with different neuron models is investigated, and it is confirmed that the sodium and potassium channels in our simplified neuron model are made out of memristors. In addition, the channel equations in the simplified model may be adjusted to introduce a simplified memristor model that is in accordance with the theoretical conditions of the memristive systems.

Keywords: Neuron model; Hodgkin and huxley equations; Action potential; Memristor.

703. Bound to Continuum Absorption Coefficient for Spherical and Conical Quantum Dots

Tarek A. Ameen and Yasser M. El-Batawy

Optical and Quantum Electronics, 47: 149-157 (2015) IF: 0.987

In this paper, the effects of the incident light polarization on the bound to continuum absorption coefficient of both spherical and conical quantum dots have been investigated. The study is based on the effective mass theory and the non equilibrium Green's function formalism. For the bound to continuum component of the absorption coefficient, both of inplane and perpendicular polarization effects have been studied for different sizes of conical and spherical quantum dots. Generally, the behavior of conical and spherical quantum dots are similar in case of perpendicular polarization, but their behaviors are different in the case of in-plane polarization.

Keywords: Self-assembled quantum dots; Non equilibrium green'S function; Light absorption coefficient.

704. Tunable Terahertz Omnidirectional Photonic Gap in One Dimensional Graphene Based Photonic Crystals

Sahar A. El-Naggar

Optical and Quantum Electronics, 47: 1627-1636 (2015) IF: 0.987

In this article, we propose a new design of one-dimensional graphene-based photonic crystal (GPC). The first layer of the unit cell of the GPC consists of a dielectric wherein graphene sheets are embedded and the second layer is a dielectric medium. The transmission properties of the GPC are investigated using the transfer matrix method. Numerical calculations of the transmittance show that the suggested structure possesses a new type of the photonic band gap in the THz region that is robust for both transverse electric and magnetic polarizations. In addition, the demonstrated gap is independent of the incidence angle. Moreover, we show that the width of the gap can be tuned by the properties of the graphene sheets. The proposed structure works as a perfect stop filter, which completely blocks both polarizations, and may have many other potential applications.

Keywords: Photonic crystals; Graphene; Terahertz applications; Omnidirectional.

705. Effects of Ion Slip and Hall Current on Unsteady Couette Flow of A Dusty Fluid Through Porous Media with Heat Transfer

H. A. Attiaa, W. Abbasb, A. ElDin Abdin and M. A. M. Abdeen

High Temperature, 53: 891-898 (2015) IF: 0.952

In this study, the unsteady Couette flow with heat transfer of a dusty viscous incompressible electrically conducting fluid through a porous medium is studied with the consideration of both Hall current and ion slip. The parallel plates are porous and subjected to a uniform suction from above and injection from below while an external uniform magnetic field is applied perpendicular to the plates. A numerical solution for the governing momentum and energy equations are obtained using the finite difference method. The influence of magnetic field parameters, the porosity of the medium, suction or injection velocity, and ion slip parameter on velocity and temperature fields of both fluid and dust particles is demonstrated.

Keywords: Unsteady; Ouette flow; Heat transfer; Dusty viscous Incompressible fluid; Ion flip; Numerical solution.

706. Design of Positive, Negative, and Alternating Sign Generalized Logistic Maps

Wafaa S. Sayed, Ahmed G. Radwan and Hossam A. H. Fahmy

Discrete Dynamics in Nature and Society, 2015: 1-23 (2015) IF: 0.877

The discrete logistic map is one of the most famous discrete chaotic maps which has widely spread applications. This paper investigates a set of four generalized logistic maps where the conventional map is a special case. The proposed maps have extra degrees of freedom which provide different chaotic characteristics and increase the design flexibility required for many applications such as quantitative financial modeling. Based on the maximum chaotic range of the output, the proposed maps can be classified as positive logistic map, mostly positive logistic map, negative logistic map, and mostly negative logistic map. Mathematical analysis for each generalized map includes bifurcation diagrams relative to all parameters, effective range of parameters, first bifurcation point, and the maximum Lyapunov exponent (MLE). Independent, vertical, and horizontal scales of the bifurcation diagram are discussed for each generalized map as well as a new bifurcation diagram related to one of the added parameters. A systematic procedure to design two-constraint logistic map is discussed and validated through four different examples.

Keywords: Logistic maps; Chaos; Bifurcations; Mle.

707. Pinched Hysteresis with Inverse-Memristor Frequency Characteristics in Some Nonlinear Circuit Elements

M.E. Fouda, A.S. Elwakil and A.G. Radwan

Microelectronics Journal, 46: 834-838 (2015) IF: 0.836

Pinched hysteresis is considered to be a signature of the existence of memristance. However, here we report on a model that exhibits pinched hysteresis yet it may represent a nonlinear inductor or a nonlinear capacitor (both with quadratic nonlinearity) or a derivative-controlled nonlinear resistor/transconductor. Further, the lobe area of the pinched hysteresis loop in these devices has inverse-memristor characteristics; i.e. it is observed to widen rather than decline with increased operating frequency. Experimental results are provided to validate the model.
Keywords: Pinched hysteresis; Nonlinear devices; Memristors.

708. Memristor Based N-Bits Redundant Binary Adder

A.A. El-Slehdar, A.H. Fouad and A.G. Radwan

Microelectronics Journal, 46: 207-213 (2015) IF: 0.836

This paper introduces a memristor based N-bits redundant binary adder architecture for canonic signed digit code CSDC as a step towards memristor based multilevel ALU. New possible solutions for multi-level logic designs can be established by utilizing the memristor dynamics as a basis in the circuit realization. The proposed memristor-based redundant binary adder circuit tries to achieve the theoretical advantages of the redundant binary system, and to eliminate the carry (borrow) propagation using signed digit representation. The advantage of carry elimination in the addition process is that it makes the speed independent of the operands length which speeds up all arithmetic operations. One memristor is sufficient for both the addition process and for storing the final result as a memory cell. The adder operation has been validated via different cases for 1-bit and 3-bits addition using HP memristor model and PSPICE simulation results.
Keywords: Memristor; Adder; Redundant binary; Multi-level; Digital circuits; Ternary; Carry free adders.

709. The Fractional-Order Time Derivative Curl Operator in Parallel Plate Waveguides

R. Ismail, A. G. Radwan and R. A. El-Barkouky

Jokull, 65: 213-232 (2015) IF: 0.765

The factional curl operator introduced a few years ago provides additional solutions to an electromagnetic problem rather than the dual ones. This operator depends mainly on Maxwell's equations which contain integer-order derivatives with respect to time. In this paper, this concept of fractional curl operator is modified upon the consideration of fractional-order time derivatives in Maxwell's curl equations. This leads to increase the degree of freedom of the operator due to the imposed fractional parameters. Moreover, applying the modified form on an example of a parallel plate waveguide shows that these added parameters introduce a power loss term that can model the frequency-dependent losses although all resistive elements are neglected during this study. By setting all fractional parameters to unity, the conventional case is retrieved. Moreover, in this paper a numerical algorithm is applied to approximate the fractional curl operator as an explicit method to handle it.
Keywords: Fractional calculus; Fractional curl operators; Maxwell equations; Rectangular waveguides.

710. On the Asymptotic Behavior of Positive Solutions of Certain Fractional Differential Equations

Said R. Grace

Mathematical Problems in Engineering, Article ID 945347: 1-7 (2015) IF: 0.762

This paper deals with the asymptotic behavior of positive solutions of certain forced fractional differential equations of the form $cD^{\alpha_c} y(t) = e(t) + f(t, x(t)), c > 1, \alpha \in (0,1)$, where $y(t) = (a(t)x'(t))'$, $c_0 = y(c)/\Gamma(1) = y(c)$, and c_0 is a real constant. From the obtained results, we derive a technique which can be applied to some related fractional differential equations.
Keywords: Asymptotic behavior; Positive solutions; Fractional eifferential equations.

711. General Analysis of Timoshenko Beams on Elastic Foundation

S. Abohadima, M. Taha, and M. A. M. Abdeen

Mathematical Problems in Engineering, 1-11 (2015) IF: 0.762

General analytical solutions for stability, free and forced vibration of an axially loaded Timoshenko beam resting on a two-parameter foundation subjected to nonuniform lateral excitation are obtained using recursive differentiation method (RDM). Elastic restraints for rotation and translation are assumed at the beam ends to investigate the effect of support weakening on the beam behavior. However, the effects of rotational inertia and shear stress induced from the axial load are considered. The obtained solutions are verified first and then used to investigate the significance of different parameters on the beam behavior. In addition, solutions of forced vibration are analyzed to highlight the effects of excitation non homogeneity on the beam behavior.
Keywords: Recursive differentiation method; Timoshenko beams on elastic foundation; Critical loads; Natural frequencies; Forced vibration.

712. Power Dissipation of Memristor-Based Relaxation Oscillators

Mohammed E. Fouda and Ahmed G. Radwan

Radioengineering, 24: 968-973 (2015) IF: 0.653

Recently, many reactance-less memristive relaxation oscillators were introduced, where the charging and discharging processes depend on memristors. In this paper, we investigate the power dissipation in different memristor based relaxation oscillators. General expressions for these memristive circuits as well as the power dissipation formulas for three different topologies are derived analytically. In addition, general expressions for the

maximum and minimum power dissipation are calculated. Finally, the calculated expressions are verified using PSPICE simulations showing very good matching.

Keywords: Memristor; Power; Reactance-less; Memristive circuits; Oscillators.

713. Recursive Differentiation Method: Application to the Analysis of Beams on two Parameter Foundations

Mohamed Taha Mohamed Hassan and Hassan Doha

The recursive differentiation method (RDM) is introduced and employed to obtain analytical solutions for static and dynamic stability parameters of beams resting on two-parameter foundations in various different end conditions. The present analysis reflects the reliability, efficiency and simplicity of the proposed RDM in tackling boundary value problems. In fact, it is widely common that the critical load accompanied with the first buckling mode is the smallest critical load, and then it is the dominant factor in the static stability analysis. In contrast, the present analysis indicates that such a conclusion is correct only for the case of beams without foundations or in the case of a weak foundation relative to the beam. It is proved that critical loads accompanied with higher buckling modes may be smaller than those accompanied with the lower modes and then it may control the stability analysis. The same phenomenon exists for natural frequencies in the presence of an axial load. Several illustrations are introduced to highlight the effects of both the foundation stiffness and beam slenderness on the critical loads and natural frequencies.

Keywords: Critical loads; Natural frequencies; Recursive differentiation method; Beam on elastic foundation.

714. Fractional Order Oscillators Based on Operational Transresistance Amplifiers

Lobna A. Saida, Ahmed G. Radwan, Ahmed H. Madian and Ahmed M. Solimane

In this paper, a general analysis of the fractional order operational transresistance amplifiers (OTRA) based oscillator is presented and validated through eight different circuits which represent two classifications according to the number of OTRAs. The general analytical formulas of the oscillation frequency, condition as well as the phase difference are illustrated for each case and summarized in tables. One of the advantages of the fractional-order circuit is the extra degrees of freedom added from the fractional-order parameters. Moreover different special cases $\{ \alpha = \beta /= 1, \beta /= \alpha = 1, \alpha /= \beta = 1\}$ are investigated where the conventional case a $\alpha = \beta = 1$ is included in all of them. Also, the effect of the fractional order parameter on the phase difference between the two oscillator outputs is presented which increases the design flexibility and controllability. The effect of the non-ideal characteristics associated with OTRA on the presented oscillator is also studied. A comparison between the fractional order oscillators with their integer order counterpart is also

presented to verify the advantages of the added fractional order parameters. Numerical and spice simulations are given to validate the presented analysis.

Keywords: Fractional-order circuits; Integer order systems; Otra; Oscillators.

715. Em-Based Yield Optimization Exploiting Trust-Region Optimization and Space Mapping Technology

Abdel-Karim S.O. Hassan, Ahmed S.A. Mohamed and Ahmed Y. El-Sharabasy

Design centering is a design problem which looks for nominal values of circuit parameters that maximize the probability of satisfying the design specification (yield function). Direct yield optimization of electromagnetic (EM)-based circuits is obstructed by the high expense of EM simulations required in the yield estimation process. Also, the absence of any gradient information represents an obstacle against the optimization process. In this article, a new approach for design centering and yield optimization of EM-based circuits is introduced. In the proposed approach, the generalized space mapping (SM) technique is incorporated with a derivative-free trust region optimization method (NEWUOA). Moreover, a variance reduction sampling technique is implemented in the yield estimation process. Two techniques suitable for the microwave circuit design centering process are introduced. The first technique exploits the surrogate developed using any circuit optimizer, for example, minimax optimizer, in the yield maximization process. While the second technique iteratively constructs and updates an SM surrogate during the yield optimization process. Our novel approach is illustrated by practical examples showing its efficiency. One of the examples is entirely designed within the sonnet em environment.

Keywords: Derivative-free optimization; Microwave circuit design centering; Space mapping surrogates; Trust region; Yield optimization.

716. Analysis of Stressed Timoshenko Beams on two Parameter Foundations

Mohamed Taha Hassan and Mohamed Nassar

In the present work, the static and dynamic behaviors of a Timoshenko beam subjected to a static axial compression load and a dynamic lateral load resting on a two parameter foundation have been studied using Adomian Decomposition Method (ADM). After verifying the obtained expressions by comparing its results with those found in literature, it is used to calculate the critical loads in the static case, natural frequencies for free vibration and beam response in forced vibrations. Parametric study is conducted to investigate the influences of different beam and foundation parameters on the critical loads, the natural frequencies and the response of the beam.

Keywords: Forced vibration; Natural frequency; Stability parameter; Timoshenko beam; Adomian decomposition method.

Engineering Sector

717. Heat Transfer Between two Parallel Porous Plates for Couette Flow Under Pressure Gradient and Hall Current

Hazem A Attia, W Abbas, Mostafa A M Abdeen and Ahmed A M Said

Sadhana, 40: 183-197 (2015) IF: 0.476

The aim of the present paper is to study of unsteady magneto-hydrodynamic viscous Couette flow with heat transfer in a Darcy porous medium between two infinite parallel porous plates considering Hall effect, and temperature dependent physical properties under constant pressure gradient. The parallel plates are assumed to be porous and subjected to a uniform suction from above and injection from below while the fluid is flowing through a porous medium that is assumed to obey Darcy's law. A numerical solution for the governing nonlinear partial differential equations coupled set of the momentum equations and the energy equation including the viscous and Joule dissipations is adopted. The effect of the porosity of the medium, the Hall current and the temperature dependent viscosity and thermal conductivity on both the velocity and temperature distributions is investigated. It is found that the porosity number M has a marked effect on decreasing the velocity distribution (owing to a simultaneous increase in Darcy porous drag). Also the temperature T is decreased considerably with increasing porosity number. With increasing Hall current parameter m, the velocity component u (x-direction) is considerably increased, whereas velocity component w (z-direction) is reduced. Temperatures are decreased in the early stages of flow but effectively increased in the steady state with increasing m.
Keywords: Flow between two parallel plates; Couette flow; Porous medium; Heat transfer; Finite differences.

718. Fitting A Rectangular Function by Gaussians and Application to the Multivariate Normal Integrals

Hatem A. Fayed, Amir F. Atiya and Ashraf H. Badawi

Applied and Computational Mathematics, 14 (2): 194-203 (2015) IF: 0.452

This article introduces a new scheme to express a rectangular function as a linear combination of Gaussian functions. The main idea of this scheme is based on fitting samples of the rectangular function by adapting the well-known clustering algorithm, Gaussian mixture models (GMM). This method has several advantages compared to other existing fitting algorithms. First, it incorporates an efficient algorithm that can fit more Gaussian functions. Second, weights of the linear combination are already constrained in the algorithm to lie in the interval [0,1], which avoids large/small values that cause numerical instability. Third, almost the entire fitted Gaussian functions lie within the interval of the rectangular function, which can be utilized efficiently to approximate difficult definite integrals such as the multivariate normal integral. Experiments show that it is efficient when low accuracy is required (error of order of 10^-4) especially for small values of the correlation coefficients.
Keywords: Function approximation; Gaussian functions; Gaussian mixture models; Multivariate normal integrals.

719. Oscillation of Fourth-order Nonlinear Neutral Delay Dynamic Equations

S. R. Grace and A. Zafer

Hacettepe Journal of Mathematics and Statistics, 44 (2): 331-339 (2015) IF: 0.413

In this work we establish some new sufficient conditions for oscillation of fourth-order nonlinear neutral delay dynamic equations of the form

$$(a(t)([x(t) - p(t)x(h(t))]^{\Delta\Delta\Delta})^\alpha)^\Delta + q(t) \, x^B \, (g(t)) = 0, \, t \, \epsilon \, [to \, \infty)\mathbb{T},$$

where α and β are quotients of positive odd integers with $\beta \leq \alpha$.
2000 AMS Classification: 34C10, 34C15.
Keywords: Oscillation; Neutral; Time scales; Fourth-order.

720. Oscillation Criteria for Some Higher Order Integrodynamic Equations on Time Scales

Said R. Grace and Mohamed A. El-Beltagy

Abstract and Applied Analysis, Article ID 160240: 1-10 (2015)

We study the oscillation behavior for some higher order integrodynamic equations on timescales. We establish some new sufficient conditions guaranteeing that all solutions of theses equations are oscillatory. Some numerical examples in the continuous case are given to validate the theoretical results.
Keywords: Oscillation criteria; Higher order integrodynamic equations; Timescales.

Dept. of Irrigation & Hydraulics Engineering

721. Gene Expression Models for Prediction of Longitudinal Dispersion Coefficient in Streams

Ahmed M.A. Sattar and Bahram Gharabaghi

Journal of Hydrology, 524: 587-596 (2015) IF: 3.053

Longitudinal dispersion is the key hydrologic process that governs transport of pollutants in natural streams. It is critical for spill action centers to be able to predict the pollutant travel time and break-through curves accurately following accidental spills in urban streams. This study presents a novel gene expression model for longitudinal dispersion developed using 150 published data sets of geometric and hydraulic parameters in natural streams in the United States, Canada, Europe, and New Zealand. The training and testing of the model were accomplished using randomly-selected 67% (100 data sets) and 33% (50 data sets) of the data sets, respectively. Gene expression programming (GEP) is used to develop empirical relations between the longitudinal dispersion coefficient and various control variables, including the Froude number which reflects the effect of reach slope, aspect ratio, and the bed material roughness on the dispersion coefficient. Two GEP models have been developed, and the prediction uncertainties of the developed GEP models are quantified and compared with those of existing models, showing improved prediction accuracy in favor of GEP models. Finally, a parametric analysis is performed for further verification of the developed GEP models. The main reason for the higher accuracy of the GEP models compared to the existing regression models is that exponents of the key variables (aspect ratio and bed material

roughness) are not constants but a function of the Froude number. The proposed relations are both simple and accurate and can be effectively used to predict the longitudinal dispersion coefficients in natural streams.

Keywords: Longitudinal dispersion coefficient; Uncertainty analysis.

722. An Entrainment Model for Non-Uniform Sediment

Mohamed Elhakeem and Ahmed M. A. Sattar

A model was developed for the prediction of the entrainment rate of non-uniform sediment considering the movement of bedforms. Laboratory experiments were conducted to advance the formulations of the proposed model and to validate and estimate the model parameters. The model parameters were related to the hydraulic conditions of the flow and the properties of the sediment mixtures using dimensional analysis and gene expression programming. The model incorporated four parameters on its formulation, namely the Shields stress and critical Shields stress to describe the hydraulic and sediment conditions of the flow, the Kramer coefficient of uniformity to describe the grain size distribution of a particular sediment mixture, and the relative position of a particular grain size fraction to the geometric mean to describe the entrainment rate of that fraction within the sediment mixture. The proposed model provided satisfactorily predictions with a deviation less than 25% between the measured and predicted values for most of the fractions, which confirms the validity of the proposed approach and model in predicting of the entrainment rates of various fractions. The model predictions were also compared with other models available for the prediction of the entrainment rate of non-uniform sediment. The model predictions were within the same order of magnitude of the other models' predictions. Copyright © 2015 John Wiley & Sons, Ltd.

Keywords: Non-uniform sediment; Entrainment rate; Gene expression programming.

723. Neuro-Fuzzy GMDH Approach to Predict Longitudinal Dispersion in Water Networks

Mohammad Najafzadeh and Ahmed M. A. Sattar

Longitudinal dispersion in pipelines leads to changes in the characteristics of contaminants. It is critical to quantify these changes because the contaminants travel through water networks or through chemical reactors. The essential characteristics of longitudinal dispersion in pipes can be described by the longitudinal dispersion coefficient. This paper presents the application of the adaptive Neuro fuzzy group method of data handling to develop new empirical formulae for the prediction of longitudinal dispersion coefficients in pipe flow using 233 experimental case studies of dispersion coefficient with a R_e range of 900 to 500,000 spanning laminar, transitional and turbulent pipe flow. The NF-GMDH network was improved using particle swarm optimization based evolutionary algorithm. The group method data handling is used to develop empirical relations between the longitudinal dispersion coefficient and various control variables, including the Reynolds number, the average velocity, the pipe friction coefficient and the pipe diameter. GMDH holds advantage in the case of small data samples due to the optimal choice of the model complexity with automatic adaptation to an unknown level of the data uncertainties. Sensitivity analysis is performed on the developed model and the weight and importance of each control variable is presented. The results indicate that the proposed relations are simpler than previous numerical solutions and can effectively evaluate the longitudinal dispersion coefficients in pipe flow.

Keywords: Longitudinal dispersion coefficients; Adaptive neuro fuzzy group method.

Dept. of Mechanical Design and Production

724. Micro Electromagnetic Vibration Energy Harvester Based on Free/Impact Motion for Low Frequency–Large Amplitude Operation

Ahmed Harouna, Ichiro Yamada and Shinichi Warisawa

This paper presents design, simulation, and experimentation of a novel micro-electromagnetic vibration energy harvester based on free/impact motion. Power harvesting is simply achieved from relative oscillation between a permanent magnet allowed to move freely inside a tube-carrying electrical coil with two end stoppers and directly connected to the vibration source.

The proposed harvester with free/impact motion shows a non-resonant behaviour in which the output power continuously increase with the input frequency and/or amplitude. In addition, the allowable free motion permits significant power scavenging at low frequencies. Hence, the proposed harvester is well suited for the applications involved variable large amplitude–low frequency vibrations such as human-powered devices. A nonlinear mathematical model of the proposed harvester including electromagnetic and impact characteristics is derived and used further for a case study model prediction. A unique way of oscillation is observed, in which four modes of magnet/tube relative motion appear over the range of exciting amplitudes and frequencies.

Two experiments are conducted on different fabricated prototypes. The first shows the effect of different magnet shapes on the harvesting performance, and the second is carried out to investigate the performance of two different size prototypes with variable large amplitude-low frequency vibrations. A harvester with cylindrical total size of D9 × L12 mm can generate RMS power of 71.8 µW at (2.5 Hz and 5.2 ms-2) and 113.3 µW at (3.33 Hz and 12.38 ms-2). Another of D7 × L12 mm size can generate RMS power of 28.4 µW at (2.5 Hz and 5.2 ms-2) and 82.9 µW at (3.33 Hz and 12.38 ms-2). Comparison with some previously fabricated low frequency energy harvesters is made which shows the advantageous of the new harvester in size minimization as well as the significant power raise with the input amplitude.

Keywords: Micro-electromagnetic vibration energy harvester; Free/impact motion; Non-resonant; Modes of motion; Low frequencies; High amplitudes.

725. Study of Electromagnetic Vibration Energy Harvesting with Free/Impact Motion for Low Frequency Operation

Ahmed Haroun, IchiroYamada and Shin'ichiWarisawa

Journal of Sound and Vibration, 349: 389-402 (2015) IF: 1.813

This paper presents study of an electromagnetic vibration energy harvesting configuration that can work effectively at low frequencies. Unlike the conventional form of vibration energy harvesters in which the mass is directly connected to a vibrating frame with spring suspension, in the proposed configuration a permanent magnet mass is allowed to move freely within a certain distance inside a frame-carrying coil and make impacts with spring end stops. The free motion distance allows matching lower vibration frequencies with an increase in the relative amplitude at resonance. Hence, significant power could be generated at low frequencies. A nonlinear mathematical model including impact and electromagnetic induction is derived. Study of the dynamic behaviour and investigation of the system performance is carried out with the aid of case study simulation. The proposed harvester shows a unique dynamic behaviour in which different ways of response of the internal relative oscillation appear over the range of input frequencies. A mathematical condition for the response type at which the higher relative amplitude appears is derived, followed by an investigation of the system resonant frequency and relative amplitude. The resonant frequency shows a dependency on the free motion distance as well as the utilized mass and spring stiffness. Simulation and experimental comparisons are carried out between the proposed harvester and similar conventional one tuned at the same input frequency. The power generated by the proposed harvesting configuration can reach more than 12 times at 11 Hz in the simulation case and about 10 times at 10 Hz in the experimental case. Simulation comparison also shows that this power magnification increases by matching lower frequencies which emphasize the advantages of the proposed configuration for low frequency operation.
Keywords: Vibration energy harvesting; Electromagnetic; impact; Modes of motion; Low frequencies; High resonant relative amplitude.

726. Wear Characterization of Carbon Nanotubes Reinforced Acetal Spur, Helical, Bevel and Worm Gears Using ATs Universal Test Rig

Samy Yousef Osman, Abdelrahman H. Abdalla and Gamal A. Zohdy

Minerals, Metals and Materials Society, 67: 2892-2899 (2015) IF: 1.757

Although the applications of nanotechnologies are increasing, there remains a significant barrier between nanotechnology and machine element applications. This work aims to remove this barrier by blending carbon nanotubes (CNT) with common types of acetal polymer gears (spur, helical, bevel and worm). This was done by using adhesive oil (paraffin) during injection molding to synthesize a flange and short bars containing 0.02% CNT by weight. The flanges and short bars were machined using hobbing and milling machines to produce nanocomposite polymer gears. Some defects that surfaced in previous work, such as the appearance of bubbles and unmelted pellets during the injection process, were avoided to produce an excellent dispersion of CNT

in the acetal. The wear resistances of the gears were measured by using a TS universal test rig using constant parameters for all of the gears that were fabricated. The tests were run at a speed of 1420 rpm and a torque of 4 Nm. The results showed that the wear resistances of the CNT/acetal gears were increased due to the addition of CNT, especially the helical, bevel and worm gears.
Keywords: Wear characterization; Carbon nanotubes.

727. A Neighborhood Search Function for Flexible Job Shop Scheduling With Separable Sequence-Dependent Setup Times

Tamer F. Abdelmaguid

Applied Mathematics and Computation, 260: 188-203 (2015) IF: 1.551

This paper addresses the makespan minimization problem in scheduling flexible job shops whenever there exist separable sequence-dependent setup times. An extension to the neighborhood search functions of Mastrolilli and Gambradella, developed for the flexible job shop scheduling problem (FJSP), is provided. It is shown that under certain conditions such an extension is viable. Accordingly, a randomized neighborhood search function is introduced, and its best search parameters are determined experimentally using modified FJSP benchmark instances. A tabu search approach utilizing the proposed neighborhood search function is then developed, and experimentations are conducted using the modified instances to benchmark it against a lower bound. Experimental results show that on average, the tabu search approach is capable of achieving optimality gaps of below 10% for instances with low average setup time to processing time ratios.
Keywords: Flexible job shop scheduling; Sequence-dependent setup time; Neighborhood search; Tabu search; Algorithm design.

728. Effect of Local Wall Thinning on Shakedown Regimes of Pressurized Elbows Subjected to Cyclic In-Plane and Out-Of-Plane Bending

Amr A. Oda, Mohamed M. Megahed and Hany F. Abdalla

International Journal of Pressure Vessels and Piping, 134: 11-24 (2015) IF: 1.283

The current research utilizes a direct non-cyclic technique to generate elastic shakedown domains for thinned-wall 90 elbows. The elbows are subjected to simultaneous steady internal pressures and cyclic in-plane and out-of-plane bending moments. Wall thinning is located at the intrados, extrados, and crown once at a time. Effects of thinning depth and thinning location under both cyclic in-plane and outof- plane bending modes are investigated. Generated shakedown boundaries are compared to those corresponding to sound elbows. Elbows subjected to out-of-plane bending moments revealed relatively higher shakedown domains compared to corresponding elbows subjected to in-plane bending. It is generally noticed that thinning at the intrados or crown has more severe effect on reducing elbows shakedown domains as compared to thinning at the extrados for both in-plane and out-of-plane bending modes.
Keywords: Elbow; Thinning; Shakedown; Ratcheting; Reversed plasticity.

729. Tribological Behavior of Carbon Nanotubes as an Additive on Lithium Grease

Alaa Mohamed, T. A. Osman, A. Khattab and M. Zaki

Carbon nanotubes (CNTs) with 10 nm average diameter and 5 µm in length were synthesized by electric arc discharge. The morphology and structure of CNTs were characterized by high resolution transmission electron microscopy and X-ray powder diffraction. The tribological properties of CNTs as an additive on lithium grease were evaluated with a four ball tester. The results show that the grease with carbon nanotubes exhibit good performance in anti-wear and decrease the wear scare diameter about 63%, decrease friction reduction about 81.5%, and increase the extreme pressure properties and load carrying capacity about 52% with only 1% wt. of CNTs added to lithium grease.. The action mechanism was estimated through analysis of the worn surface with a scanning electron microscope and energy dispersive x-ray. The results indicate that a boundary film mainly composed of CNTs, Cr, iron oxide and other organic compounds was formed on the worn surface during the friction process.
Keywords: Carbon nanotubes; Tribological behavior; Lithium grease; Lubricant additives; Anti wear; Friction coefficients.

730. Failure Analysis of Thermowell Weldment Cracking

M.M. Megahed and M.S. Attia

This study presents the root cause analysis of a weldment failure in a thermowell assembly operating in a natural gas processing plant. Laboratory investigations indicated inferior quality for the fillet weld joining the thermowell flange to the pipe supporting the thermowell to the main pipe. The fillet weld exhibited excessive concavity, lack of penetration and lack of fusion. This led to minute weldment cracking, which was exacerbated by flow-induced vibrations exceeding safe operational limits. This promoted small magnitude, high frequency stress cycling coupled with high mean stress at the poorly welded joint, which led to accumulation of high cycle fatigue damage and final fracture causing gas leakage. Mitigation plans included use of a shorter support pipe and revised safe operational envelope of the pipeline under consideration.
Keywords: Thermowells; Natural gas plants; Failure analysis; Flow-induced vibrations; Finite element analysis.

731. Nanoreinforced Cast Al-Si Alloys With Al$_2$O$_3$, TiO$_2$ and ZrO$_2$ Nanoparticles

Iman S. El-Mahallawi, Ahmed Yehia Shash and Amer Eid Amer

This study presents a new concept of refining and enhancing the properties of cast aluminum alloys by adding nanoparticles. In this work, the effect of adding alumina (Al2O$_3$), titanium dioxide (TiO$_2$) and zirconia (ZrO$_2$) nano-particles (40 nm) to the aluminum cast alloy A356 as a base metal matrix was investigated. Alumina, titanium dioxide and zirconia nano-powders were stirred in the A356 matrix with different fraction ratios ranging from (0%–5%) by weight at variable stirring speeds ranging from (270, 800, 1500, 2150 rpm) in both the semisolid (600 °C) and liquid (700 °C) state using a constant stirring time of one minute. The cast microstructure exhibited change of grains from dendritic to spherical shape with increasing stirring speed. The fracture surface showed the presence of nanoparticles at the interdendritic spacing of the fracture surface and was confirmed with EDX analysis of these particles. The results of the study showed that the mechanical properties (strength, elongation and hardness) for the nanoreinforced castings using Al$_2$O$_3$, TiO$_2$ and ZrO$_2$ were enhanced for the castings made in the semi-solid state (600 °C) with 2 weight% Al$_2$O$_3$ and 3 weight% TiO$_2$ or ZrO$_2$ at 1500 rpm stirring speed.
Keywords: Nanoreinforced castings; Nsemisolid casting; Hypoeutectic aluminum alloys.

732. Joints Flexibility Effect on the Dynamic Performance of Robots

Mohamed H. Zahera and Said M. Megahed

This paper studies the effect of joints flexibilities on the dynamic performance of a serial spatial robot arm of rigid links. Three models are developed in this paper. The first model is developed using multibody dynamics approach, while the second using the classical robotics approach. A numerical algorithm and an experimental test-rig are developed to test the final model. The links' inertial parameters are estimated numerically. Empirical formulae with assumption models are used to estimate the flexibility coefficients. The simulation results are compared to the perfect geometry joints case. The simulation results show that the joint damping is a major source of inaccuracies, causing trajectory error without a proper feedback controller.
Keywords: Flexible joint robot; Multibody systems; modeling; Kinematically constrained dynamic system; Denavit-hartenberg.

733. Effect of Tempcore Processing on Mitigating Problems of Tramp Elements in Low C Steel Produced from Recycled Material

Ahmed Ramadan, A.Y. Shash, I.S. EL-Mahallawi, D. Senk and Taha Mattar

Energy, environmental and economic requirements caused the majority of steelmakers to adopt technologies using scrap as the main constituent of the charge, where electric arc furnace (EAF) charge is commonly based on 100% steel scrap, nowadays. The increased use of scrap charge in the steel making process results in rising amounts of some residual elements, the presence of which contribute largely to continuous casting and hot rolling defects. Therefore, the effect of tramp elements in the steel has been intensively studied in this work. It was found that, under normal cooling conditions, the solubility of tramp elements will decrease as the temperature decreases, where the tramp elements (Cu, Pb, Sn) will diffuse toward the grain boundaries and form intermetallic compounds or rich phases which have low melting points causing reduction in ductility and failure during the bending test. Re-bars with increased Cu content that were left to

air cool after the last step showed drop in elongation%, up to 32%. On the other hand, the samples with high percentage of tramp elements as (Cu, Pb, Sn) in the billet that have been rolled and subjected to tempcore process, did not show drop in elongation or failure in bending test (especially for re-bar sizes less than 32 mm), however the copper must be less than 0.35 wt.% to prevent the precipitation of Cu rich zones of critical size in size 32 mm produced by tempcore process. When quenching is applied the tramp elements will remain in the interstitial super saturated solid solution positions inside the grains and will not have the chance to diffuse and form precipitates, hindering the copper precipitates from reaching the critical size necessary for impairing the properties. This will hinder the occurrence of the harmful effect of the tramp elements on the elongation or the hot shortness after rolling.

Keywords: Recycled steel; Hot shortness; Crack susceptibility; Tempcore process; Tramp element; Residual melt.

734. Effect of Alloying Elements on Corrosion, Microstructure and Mechanical Properties for Casted Free-Nickel Duplex Stainless Steels

Ragaie Rashad, Amer E. Amer, Ahmed Y. Shash and Hany Shendy

Free nickel Duplex stainless steels containing two different levels of 6–13 wt% manganese contents have been studied and analysed. The alloys, made up of appropriate mixtures of the alloying elements, Ferro alloys and Ferro-alloys bearing nitrogen were melted in an induction furnace under nitrogen pressure. Even though the resistance to the pitting attack was controlled and enhanced by the nitrogen addition as well as, chromium, molybdenum contents. Also, the cast experimental alloy that contained high manganese was found to offer some advantages over the 2205-type duplex stainless steel in combination of mechanical properties and corrosion resistance. The microstructure development due to increasing manganese contents from 6 to 13 wt% revealed the decrease of the ferrite volume fraction from 82 to 75 %, respectively. Mechanical testing results showed that the free nickel alloys containing 0.14–0.23 wt% carbon with manganese contents ranging from 6.44 to 13.45 wt% have moderate mechanical properties whereas U.T.S. ranging from (691–815) MPa, Y.S. (585–738) MPa, elongation (19–21 %), and a corrosion rate of 0.044–6.0 mm/year, respectively. Manganese is therefore an effective element of duplex microstructures. As an economical development, it is concluded that manganese is a useful replacement element for nickel in duplex alloys, but further work is required before the present alloys, or variations of them, could be commercially viable.

Keywords: Free-nickel duplex stainless steels; Corrosion resistance; Pitting attack; Microstructure development.

735. Enhancement of Pearlitic Structure Through Inoculation With Nano-Size Silicon Carbide

Mohamed Kamal El-Fawkhry, Ahmed Shash, Sherif Ali, Hassan Bahaa and Taha Mattar

The feasibility of SiC inoculation for low carbon steel was studied in this work. Five heats of low carbon steel with different percentage of silicon carbide inoculants have been compared with the reference steel in terms of microstructure, tensile properties, and wear abrasion resistance. The optical observations using optical and scanning electron microscope declare that the weight percentage of SiC inoculants has a significant effect on the pearlite fractions increment, as well as its morphology. The excellent response of the enhancement in the pearlitic structure is observed by tensile test. The impact toughness of inoculated steel approaches 250% more than non-inoculated steel. In the same way, the wear abrasion resistance is improved by nanoinoculation, especially at heavy load conditions.

Keywords: Silicon carbide; Pearlite structure; Low carbon steel; Inoculation; Nano-size inoculants; Fine grain steel .

736. Influence of Al_2o_3 Nano-Dispersions on Mechanical and Wear Resistance Properties of Semisolid Cast A35^6 Al Alloy

Ahmed Y. Shash, Amer E. Amer and Moataz El-Saeed

The present investigation studies the prospects of using nanoparticles as reinforcement ceramic powders to gain improved performance of A356 Al cast alloy. Alumina nano-powder of 40 nm size was stirred into the A356 matrix with different fraction ratios ranging from (0, 1, 2 and 4 wt%) in a mushy zone (600 °C) using a constant stirring time for one minute. To evaluate the results, the alloys were further characterized by various tribological and mechanical characterization methods. The results showed higher strength values with improved ductility when compared to the monolithic alloy under the same casting conditions. Also, the wear resistance has been positively enhanced as the amount of the Al_2O_3 nano-particles addition increases from 1 to 4 wt% leading to a decrease in the weight loss ranging from 5.5 to 4.0 mg, respectively. The Scanning Electron Microscopy of the fracture surface and the wear surface revealed the presence of nanoparticles at the interdendritic space of the fracture surface and was confirmed with an EDX analysis of these particles.

Keywords: Nano-metal matrix composites; Al_2o_3 nano-powders; wear resistance; Mushy zone; Mechanical stirring .

Dept. of Mechanical Power Engineering

737. Simulation of Unprotected LOFA in MTR Reactors Using A Mix CFD and One-D Computation Tool

Hany Khater, Salah El-Din EL-Morshedy and Abdelfatah Abdelmaksoud

CFD is expected to feature more frequently in reactor thermal hydraulics. The reason for the increased use of multidimensional CFD methods is not only the increased availability of capable computer systems but also the ongoing drive to improve and reduce uncertainty in our predictions of important phenomena. In this work, a CFD model coupled with the reactor point kinetics

equations is developed using the CFD code, Fluent to simulate loss of flow accident (LOFA) without SCRAM in a typical material testing reactor (MTR). The CFD model is used to simulate the core behavior during transient up to the onset of nucleate boiling (ONB) point. PARET code is used not only to validate the CFD model but also to complete simulation during the sub-cooled boiling regime. The focus is on establishing a new CFD approach in the reactor safety analysis and determining the two-phase flow stability boundaries as function of initial reactor conditions. Both ONB and onset of flow instability (OFI) is predicted. Besides a useful chart is provided, which describes the stability region in terms of initial reactor power, core inlet temperature, and power peaking factor.

Keywords: CFD unprotected lOFA; Thermal–hydraulics; Paret; MTR reactors.

738. Flow Simulation in Radial Pump Impellers and Evaluation of Slip Factor

Mohamed G Khalafallah, Hassan A Elsheshtawy, Abdel-Naby M Ahmed and Ahmed I Abd El-Rahman

Institution of Mechanical Engineers, J. Power and Energy, 229: 1032-1041 (2015) IF: 0.596

This work is concerned with the study of the slip phenomenon in centrifugal pumps and the evaluation of its dependence on the flow rate for a four-bladed pump. The finite volume method is used, and the impeller domain is represented by a structured grid topology. The calculations assume a rotationally periodic boundary condition, while the frozen rotor technique is used to model the interaction between the pump impeller and its surrounding volute casing. The simulation uses an implicit time integration of the dynamic equations and is carried out using the commercial ANSYS CFX-solver. Results from the simulation are found in reasonable agreement with the pump performance curve with a maximum relative error of 4% in the range of flow coefficient from 0.8 to 1.2. The calculated values of the slip factor, as a function of the flow rate, show good agreement with the Qiu's mathematical model while retaining the default value of the defined shape factor F=0.52. In this particular study, the results show that although the slip factor improves with the increase of either the number of blades or splitter length, the corresponding predicted hydraulic efficiency decreases due to the increasing friction loss.

Keywords: Centrifugal pumps; turbomachinery flow; pump performance/efficiency; slip behavior/factor.

Dept. of Mining, Petroleum and Metallurgy

739. Surface Modification of Investment Cast-316L Implants: Microstructure Effects

Shimaa El-Hadad, Waleed Khalifa and Adel Nofal

Materials Science and Engineering: C, 48: 320-327 (2015) IF: 3.088

Artificial femur stem of 316L stainless steel was fabricated by investment casting using vacuum induction melting. Different surface treatments: mechanical polishing, thermal oxidation and immersion in alkaline solution were applied. Thicker hydroxyapatite (HAP) layer was formed in the furnace-oxidized samples as compared to the mechanically polished ones. The

alkaline treatment enhanced the precipitation of HAP on the samples. It was also observed that the HAP precipitation responded differently to the different phases of the microstructure. The austenite phase was observed to have more homogeneous and smoother layer of HAP. In addition, the growth of HAP was sometimes favored on the austenite phase rather than on ferrite phase.

Keywords: Stainless steel; Investment casting; Surface modification; Hydroxyapatite.

740. Calcite Flotation in Potassium Oleate/Potassium Dihydrogen Phosphate System

Salah El-Din El-Mofty and Ayman El-Midany

Journal of Surfactants and Detergents, 18: 905-911 (2015) IF: 1.685

Calcite flotation in acidic media is a difficult task due to the solubility of calcite and consequently the release of calcium ions in the flotation pulp. In addition, the interaction of calcium ions with the flotation reagents requires the correct selection of these reagents. In this study, potassium oleate and potassium dihydrogen phosphate (KH_2PO_4) were used as collector and depressant, respectively. Micro-flotation experiments were conducted to probe the effect of these chemical reagents as well as their interaction on calcite flotation using H_2SO_4 as a pH regulator. In addition, to elucidate the depressing action of KH_2PO_4 on calcite, electrokinetic properties of calcite have been measured in relation to pH and in the absence and presence of KH_2PO_4. Moreover, thermodynamic calculations were used to rationalize the reasons for calcite depression as well as the adsorption mechanism of KH_2PO_4 onto the calcite surface.

Keywords: Calcite; Flotation; Potassium dihydrogen phosphate; Potassium oleate; Depressant.

741. Testing Oleic-SDS Mixture in the Absence/Presence Na_2SO_4 as A Phosphate Depressant

Ayman A. El-Midany, Yasir Arafat and Tariq F. Al-Fariss

Journal of Surfactants and Detergents, 18: 107-111 (2015) IF: 1.685

The reverse flotation of calcareous phosphate ores, at acidic pH, usually uses anionic collectors such as oleic acid (Ol) and sodium dodecyl sulfate (SDS). However, using a mixture of two anionic collectors is very rare. In the present paper, a mixture of oleic acid and sodium dodecyl sulfate, with a ratio 1:1, was prepared. Different dosages of Ol–SDS mixture was studied in absence or presence of sodium sulfate as a phosphate depressant at different pH values. The results showed that sodium sulfate works better at highly acidic pH where 30.7 % P_2O_5 was achieved in presence of sodium sulfate in comparison to 29 % P_2O_5 at pH 4 and 0.5 kg/t collector dosage. However, by increasing the pH, the sodium sulfate negatively affects the concentrate grade. Moreover, the sodium sulfate maintains the grade and recovery almost unchanged within the studied pH range. Although a concentrate grade exceeds 30 % P_2O_5 could be achieved with or without addition of sodium sulfate, the highest concentrate grade of 33 % P_2O_5 was obtained with 85 % recovery at 3.5 kg/t collector dosage and pH 6 with no sodium sulfate additions.

Engineering Sector

Keywords: Calcareous phosphate; Reverse flotation; Sodium sulfate; Depressant; Oleic acid; Sodium dodecyl sulfate.

742. Rice Starch as A Depressant in Phosphate Reverse Flotation

Ayman A. El-Midany, Yasir Arafat and Tariq F. El-Faris

Depressants are essential additives, to increase the separation selectivity, in the reverse flotation of phosphate by fatty acid collectors. In the current study, the rice starch is used, as a phosphate depressant, in the reverse flotation of calcareous phosphate by oleic acid. The operating parameters affecting the starch depressing action such as: collector dosage, pH and starch dosage are studied using statistical design of experiments. The design analysis showed that the starch dose has the most significant effect on the concentrate grade. A concentrate containing 30.6% P_2O_5 with a recovery of 91.6% was achieved at the optimum values of studied parameters, i.e., 4, 4kg/t, and 4kg/t for pH, starch dosage, and collector dosage, respectively. The FTIR analysis was used to characterize the interaction between the collector and starch aswell as the starch and phosphate ore. It was found that the oleic – ore interaction was chemical, whereas the starch interaction with either phosphate or oleic acid was physical.

Keywords: Calcareous phosphate; Depressant; Flotation; Starch; Upgrading.

743. Mineralogical, Physical and Chemical Characteristics of Historic Brick-Made Structures

Ayman A. El-Midany

Brick-structured historic buildings represent one of the common monument types. Although they stand till now due to their fused structure, they are subjected to weathering and are affected by environmental deterioration. To perform any conservation/restortation process, a detailed characterization of the current conditions of the bricks is needed for identification of major threats and choosing a suitable material for conservation. In this study, historic brick-made structures was subjected to detailed characterization to identify the composition and quality of raw materials as well as environmental impacts on their original structure. Different characterization techniques such as mineralogical and petrographic examination, scanning electron microscopy (SEM), and determination of physical andmechanical properties were used. The results of the characterization indicate that the bricks were manufactured from low-quality clay and treated at a temperature lower than 900 °C. In addition, environment pollution enhanced the presence of some ions, which affected the mechanical properties of bricks and lead to their deterioration and damage.

Keywords: Mineralogy; Brick-made structure; Historic building.

744. Evaluation of the Groundwater Resources Potential of Siwa Oasis Using Three-Dimensional Multilayer Groundwater Flow Model, Mersa Matruh Governorate, Egypt

Abdulaziz M. Abdulaziz and Abdalla M. Faid

Siwa represents the last virgin oasis in the western desert of Egypt. Recently, serious environmental changes pertaining to the invaluable groundwater resources, such soil salinity and expansion in surface lakes have developed due to excessive uncontrolled groundwater discharge associating land development for agriculture. The present work tackles these problems through monitoring the configuration of pressure head in carbonate and Nubian Sandstone aquifers using multilayer groundwater model. Several scenarios for pumping stress are tested, and the results indicated that the optimum pumping should be close to 520,000 m3 /day with important disturbances in the pressure head encountered between Bahei El-Din Lake and Zeitoun Lake. This aquifer stress is capable of lowering the pressure head to stop artesian flow and inconsequence saves large water quantities draining daily to the lakes through natural flow and mitigates the waterlogging problems. In addition, minimal changes are observed in the eastern part of the modeled area suggesting additional production wells to tap the aquifer system at this barren area and initiate new development projects. Such results demonstrate the potential of groundwater flow modeling in water resources management to define the optimum pumping scenarios capable to mitigate environmental problems.

Keywords: 3D groundwater modeling; Groundwater management; Arid regions; Siwa oasis; Egypt.

745. Microstructure Characteristics and Tensile Property of Ultrasonic Treated-Thixocast A356 Alloy

Waleed Khalifa, Shimaa El-Hadad and Yoshiki Tsunekawa

Billets of A356 aluminum alloy were treated using ultrasonic vibrations during solidification. The billets were reheated to the semisolid state at different routes to optimize the procedure. Billets were, then, thixocast using a die casting machine. The results showed that the ultrasonic-treated billets exhibited finely distributed a(Al) globules after reheating and thixocasting. The thixocast ultrasonic-treated billets showed higher ultimate tensile strength and elongation compared with the untreated billets. Moreover, the thixocast parts showed a tendency to ductile fracture under tension when made from ultrasonic-treated billets, while those made of untreated billets showed brittle fracture with obvious straight facets. These results revealed the feasibility and competence of ultrasonic melt treatment as a potential route for preparing billets for thixocasting.

Keywords: A356 alloy; Semi-solid forming; Ultrasonic treatment; Reheating; thixocasting; Tensile property.

746. Effect of Pouring Temperature and Water Cooling on the Thixotropic Semi-Solid Microstructure of A319 Aluminium Cast Alloy

Iman Sallah-Eldeen El-Mahallawia, Tamer Samir Mahmoudb Ahmed Mohamed Gaaferb and Fouad Helmi Mahmoudb

The cooling slope (CS) casting is the simplest and cheapest technique for producing feedstock materials with non-dendritic microstructure. Such materials are required for semi-solid metal (SSM) processing methods such as thixoforming. In the present investigation, the effect of the pouring temperature and the water cooling on the thixotropic microstructure of commercial A319 Al-Si cast alloy was studied. The results showed that increasing the pouring temperature slightly reduces the bulk porosity of the CS ingots. The ingots poured with water-cooling exhibited slightly lower porosity content than those poured with without water-cooling. Generally, the primary a-Al grains exhibited higher shape factor near the edge of ingot than the middle and center. Ingots poured with water-cooling exhibited lower grain size and shape factor than those poured without water-cooling. Increasing the pouring temperature increases the size a-Al grains.

Keywords: Cooling slope casing; Microstructure; Thixotropic; Aluminium alloys.

747. Optimizing the Welding Parameters of Reinforcing Steel Bars

Tamer Moustafa, Waleed Khalifa, M. Raafat El-Koussy and Nahed Abd El-Reheem

Welding is highly recommended for splicing concrete reinforcing bars in all concrete structures. SMAW lap-welded and butt-welded joints made from Tempcore and hot-rolled reinforcing steel bars were studied. The results give an insight into the effect of metallurgical structure and the chemical composition on the effective lap weld length of reinforcing steel bars. It was found that the hot-rolled bars gave shorter acceptable lap length than the Tempcore bars. This was because of the higher amount of pearlite/bainite phases in weld area. In the other hand, the HAZ hardening resulted in the most pronounced changes in ductility of hot-rolled joints. Preheating the hot-rolled bars up to 200 °C was insufficient to prevent the formation of HAZ hard phases.

Keywords: Rebar; Welding; Microstructure; Tensile; Haz structure; Lap weld length; Butt.

Dept. of Public Works

748. Effect of Configurations, Bacterial Adhesion, and Anode Surface Area on Performance of Microbial Fuel Cells Used for Treatment of Synthetic Wastewater

Safwat Ahmed, Ehab Rozaik and Hisham Abdelhalim

This study shows the effects of various conditions on performance of microbial fuel cells (MFCs) used to treat synthetic wastewater that contained glucose. The conditions included the following: three different configurations (dual-chamber MFC with proton exchange membrane (PEM), single-chamber MFC with PEM, and single-chamber MFC without PEM); bacterial adhesion; and increasing the anode surface area by using activated alumina, extruded activated carbon, and granular activated carbon. The maximum voltage production, power density, and COD removal values were 28 mV, 0.46 mW/m2, and 68.8 %, respectively, in case of dual-chamber MFC with PEM; 3 mV, 0.0053 mW/m2, and 54.5 %, respectively, in case of single-chamber MFC with PEM; and 78 mV, 10.77 mW/m2, and 83 %, respectively, in case of single-chamber MFC without PEM. The voltage generation, power density, and COD removal increased to 351 mV, 218 mW/m2, and 98.7 %, respectively, when using an anode electrode that was immersed in the microbial solution for 1 week beforehand in the single-chamber MFC without PEM. The voltage generation and power density improved to 420 mV and 312 mW/m2, respectively, after increasing the anode area through with 170 g activated alumina, but no improvement was observed when using extruded activated carbon or granular activated carbon under the same conditions.

Keywords: Microbial fuel cells; Configurations; Bacterial adhesion; Activated alumina; Extruded activated carbon; Granular activated carbon.

749. An Economical, Environmental, and Social Comparison Between Vacuum and Gravity Sewers in Decentralized Sanitation Systems, with Egypt as A Case Study

Abdelsalam Elawwad, Mostafa Ragab and Hisham Abdel-Halim

The conventional gravity sewer is the most commonly used rural sewerage system in developing countries. However, this system has many technical, economic, environmental, and social disadvantages. Vacuum sewers could serve as a good competitor as an alternative system to conventional gravity sewers. A sample of 33 rural villages with populations of <10,000 people is selected from Egypt. A statistical analysis was done using SPSS and STATISTICA software where population and area variables had the most significant effect on the calculation of investment, operation, and maintenance costs. It was found that investment costs for the vacuum system were mostly lower than for the conventional one, while operational and maintenance costs played significant roles. Prediction models were obtained based on multiple quadratic regression models. It was found that the vacuum system was economically competitive in large villages with low population densities. Environmentally and socially, the vacuum sewers proved to be better than gravity sewers.

Keywords: Decentralized systems; Gravity sewers; Vacuum sewers.

Dept. of Structural Engineering

750. Seismic Vulnerability of Box Girder Continuous Bridges Under Spatially Variable Ground Motions

O. M. O. Ramadan · S. S. F. Mehanny and H. A. Elhowary

Engineering Sector

In seismic design of extended multi-span bridges the question always arises whether using either natural or artificially generated earthquake records that are identical at all bridge supports is valid or not. It is likely that earthquake ground motion remarkably differs at the various support/pier locations in terms of amplitude, frequency content and arrival time, inducing under certain circumstances significant forces and deformations that would not develop if the assumption of synchronous excitation was adopted. This paper hence illustrates the impact of ground motion spatial variability on the seismic performance and vulnerability of extended continuous box girder bridges in both bridge orthogonal directions (longitudinal and transverse). For illustration purposes, a nine-span bridge with a total length of 430m is adopted. Non-linear time history analyses are carried out using opensees software. The effects of the spatial variability in the ground motions at the different bridge supports are investigated using a set of 20 artificially simulated seismic ground motions generated using sim software developed in the mid-nineties, considering different degrees of loss in coherency and various soil types (i.e., frequency contents). Results of the non-linear time history analyses performed in an incremental dynamic analysis context are hence manipulated through a probabilistic analysis framework to generate fragility curves associated with various performance levels for the case study bridge. Fragility curves giving the conditional probability of exceeding various performance levels are then integrated with generated hazard curves defining the expected seismic hazard in Egypt. The outcome of this integration process results in values of mean annual frequency of exceeding pre-defined performance levels.

Keywords: Spatially variable ground motions; Seismic fragility; Box girder continuous bridges.

751. An Efficient Meshless Technique for the Solution of Transversely Isotropic Two-Dimensional Piezoelectricity

George S.A. Fam and Youssef F. Rashed

Computers and Mathematics with Applications, 69: 438-454 (2015) IF: 1.697

piezoelectricity problem. The technique derivation is based on the solution of the corresponding analog equation by transforming the original set of differential equations into three Poisson equations with unknown right hand side terms. Boundary discretisation of the resulting integral equations is eliminated by the use of the method of fundamental solutions. The right hand side terms are represented in the solution as particular solutions expressed in terms of radial basis functions. The problem solution is then rewritten in its new form, which involves complementary solution and particular solution. The governing partial differential operator for piezoelectricity is applied on the obtained solution form and forced to be satisfied at a set of domain points, whereas the prescribed boundary conditions are satisfied at another set of boundary points. The proposed technique is implemented into computer code where several numerical examples with different boundary conditions are tested. The results demonstrated excellent agreement with those obtained from analytical and FEM solutions.

Keywords: Analog equation method; Boundary element method piezoelectric media; Transversely isotropic.

752. System-Level Displacement- and Performance-Based Seismic Design Parameter Quantifications for An Asymmetrical Reinforced Concrete Masonry Building

Paul Heerema, Ahmed Ashour, Marwan Shedid and Wael El-Dakhakhni

Journal of Structural Engineering, 141 (2015) IF: 1.504

This paper focuses on analyzing the performance of structural walls comprising the seismic force resisting system (SFRS) in a scaled asymmetrical fully grouted reinforced masonry (RM) building tested under quasi-static loading. The in-plane tensile and compressive strains calculated at the wall toes and the curvature profile along the wall height as well as the contributions of the flexural and the shear deformations to the overall wall displacements were quantified. The component-level (when the walls were tested individually) responses were compared with those at the system level (in a building). In addition, key input parameters for displacement-based seismic design approaches, including stiffness degradation and the trend of the building's effective period increase as well as the variation of hysteretic damping, were quantified. Moreover, the building energy dissipation levels were compared with those generated during the individual wall tests to quantify the contribution of each component to the overall system-level performance. Finally, within the context of performance-based seismic design, the damage states of the building walls at different loading stages were identified and the damage levels, correlated to the maximum developed crack widths in the walls, were quantified utilizing a digital image correlation-based technique. Based on the analyses conducted, it was observed that wall curvatures and the extent of plasticity from the building test were not consistent with those based on the individual wall tests. In addition, the current test results showed that the total energy dissipation of the building does not only result from the walls aligned along the loading direction, but also from orthogonal walls engaged through the floor slabs as a result of the building twist. Finally, the study is expected to contribute to understanding the system-level performance of RM SFRS in order to facilitate their adoption in the next generation of performance-based seismic design codes in North America.

Keywords: Concrete block; Cyclic loads; Digital image correlation; Ductility; Masonry; Plastic hinge; Shear wall; Seismic loads; System-level performance; Concrete and Masonry Structures.

753. Taylor Series Fast Multipole Boundary Element Method for Solution of Reissner'S Shear Deformable Plate Bending Problems

Morcos F. Samaana, Mohammed E. Nassarb and Youssef F. Rashed

Engineering Analysis With Boundary Elements, 59: 23-35 (2015) IF: 1.392

In this paper, a new fast multipole BEM for the solution of Reissner's plates is presented. The suggested formulation is based on expressing the fundamental solutions in forms of potentials. Hence, these potentials and their relevant fundamental solutions are expanded by means of Taylor series expansions. Accordingly, the far field integrations are represented by these series

expansions and summed for far clusters, whereas the near field integrations are kept to be computed directly. In the present formulation, equivalent collocations are based on both first and second shift collocations for kernels. By the present implementation of the fast multipole BEM in coupling with iterative solver (GMRES), the computational cost is rapidly reduced from O(N3) in the conventional BEM to O(N log N) and O(N) for first and second shift respectively. Numerical examples are given to demonstrate the efficiency of the formulation against the conventional direct BEM. The accuracy of the results is traced by truncating Taylor series expansions to certain terms. It was demonstrated via numerical examples that three terms for both first shift and second shift are enough to produce sufficient accuracy with substantial reduction of solution time.

Keywords: Fast multipole; Reissner's plate; Boundary element method; Plate bending; Taylor series expansion.

754. The Analog Equation Integral Formulation for Plane Piezoelectric Media

George S.A. Fam, Youssef F. Rashed and John T. Katsikadelis

In this paper, the two-dimensional piezoelectricity is modelled using a boundary integral formulation based on its corresponding Analog Equation. The problem is transformed into three uncoupled Poisson's equations with unknown fictitious body forces terms. The multiquadric radial basis function is used to approximate the fictitious body forces in the particular solutions. The problem is solved by satisfying the governing differential operator and the boundary conditions. A scaling process is used to enhance the numerical behaviour of the obtained system of equations. The formulation is mathematically simpler than formerly proposed BEM formulations and its validity, applicability and accuracy are demonstrated through various numerical examples.

Keywords: Analog equation method; Boundary element method; Piezoelectric media; Transversely isotropic.

755. Efficient Optimization of Post-Disaster Reconstruction of Transportation Networks

Omar El-Anwar, Jin Ye and Wallied Orabi

Catastrophes, such as hurricanes, earthquakes, and tsunamis often cause large-scale damage to transportation systems. In the aftermath of these disasters, there is a present challenge to quickly analyze various reconstruction plans and assess their impacts on restoring transportation services. This paper presents a new methodology for optimizing post-disaster reconstruction plans for transportation networks with superior computational efficiency employing mixed-integer linear programming (MILP). The model is capable of optimizing transportation recovery projects prioritization and contractors assignment in order to simultaneously: (1) accelerate networks recovery; and (2) minimize public expenditures. The full methodology is presented in two companion publications, where the focus of this paper is to propose new methods for (1) decomposing traffic analysis; (2)

assessing the traffic and cost performance of reconstruction plans; (3) reducing the massive solution search space; and (4) phasing the use of mixed-integer linear programming to optimize the problem. An illustrative example is presented throughout the paper to demonstrate the implementation phases.

Keywords: Transportation network reconstruction; Post-disaster recovery; Multi-objective optimization; Mixed-integer linear programming; Computational cost; Traffic analysis; Contractors assignment; Search space.

756. Innovative Linear Formulation for Transportation Reconstruction Planning

Omar El-Anwar, Jin Ye and Wallied Orabi

Following disasters, the pace of restoring transportation networks can have a significant impact on economic and societal recovery. However, reconstruction and repair efforts are typically faced by budget constraints that require careful selection among competing contractors. This paper presents an innovative formulation to optimize this complex planning problem in order to maximize the rate of transportation network recovery while minimizing the associated reconstruction costs. This study first contributes to the body of knowledge by offering an effective and efficient means of identifying the optimal schedules for reconstruction projects and the optimal contractor assign- ments. This is achieved by solving the problem using a new mixed-integer linear programming model. However, there are four main for- mulation challenges to represent this problem using linear equations because of the need to use logical operators. As such, the second contribution of this study is in offering innovative solutions to overcome these formulation challenges, which are generalizable to other construction scheduling and planning problems. This paper is companion to another paper that describes a holistic optimization and traffic assessment methodology for post-disaster reconstruction planning for damaged transportation networks.

Keywords: Transportation network reconstruction; Post-disaster recovery; Multi-objective optimization; Mixed-integer linear programming; Contractors assignment; Linear formulation; Reconstruction costs.

757. Predicting Telecommunication Tower Costs Using Fuzzy Subtractive Clustering

Mohamed Mahmoud Mahdy Marzouk

This paper presents a fuzzy subtractive modelling technique to predict the weight of telecommunication towers which is used to estimate their respective costs. This is implemented through the utilization of data from previously installed telecommunication towers considering four input parameters: a) tower height; b) allowed tilt or deflection; c) antenna subjected area loading; and d) wind load. Telecommunication towers are classified according to designated code (TIA-222-F and TIA-222-G standards) and structures type (Self-Supporting Tower (SST) and Roof Top (RT)). As such, four fuzzy subtractive models are developed to

represent the four classes. To build the fuzzy models, 90% of data are utilized and fed to Matlab software as training data. The remaining 10% of the data are utilized to test model performance. Sugeno-Type first order is used to optimize model performance in predicting tower weights. Errors are estimated using Mean Absolute Percentage Error (MAPE) and Root Mean Square Error (RMSE) for both training and testing data sets. Sensitivity analysis is carried to validate the model and observe the effect of clusters' radius on models performance.

Keywords: Cost estimating; Quantity takeoff; Telecommunication towers; Fuzzy subtractive modeling; Sensitivity analysis.

658. Analyzing Procurement Route Selection for Electric Power Plants Projects Using Smart

Mohamed Marzouk and Lobna Elmesteckawia

Journal of Civil Engineering and Management, 21: 912-922 (2015) IF: 1.07

The decision of selecting the appropriate procurement/delivery system for large investment construction projects is a critical and challenging task for clients, and therefore a significant factor for the project's success. Complex projects as electric power plants can involve managing multiple contracts or subcontracts simultaneously or in sequence. The aim of this paper is to develop, and analyze a decision support tool to select the most efficient procurement/delivery system for multiple contracts Combined Cycle Power Plants (CCPP) constructed in Egypt and funded by the publicsector. This process involved the identification of various procurement routes, followed by the utilization of quantitative values developed in accordance with the requirements of the multi-criteria decision analysis technique known as simple multi-attribute rating technique (SMART). Results revealed that the procurement/delivery system with the highest score, for all contractual packages, is the integrated project delivery method (IPD) under which other procurement/delivery methods could be utilized such as performance-based contracting (PBC), and construction management (CM). Further in this research, a sensitivity analysis approach was adopted to validate the IPD selection, and to determine the most critical criterion and the most critical measure of performance for each contractual package.

Keywords: Procurement elivery; Selection criteria; Ipd; Procurement routes; Smart; Sensitivity; Ccpp; Performance effectiveness.

659. Experimental and Numerical Study of One-Sided Branch Plate-to-Circular Hollow Section Connections

M.M. Hassan, H. Ramadan, M. Abdel-Mooty and S.A. Mourad

Steel and Composite Structures, 19: 877-895 (2015) IF: 0.964

Connections to circular hollow steel sections (CHS) are considered one of the most complex and time consuming connections in steel construction. Such connections are usually composed of gusset plates welded to the outside of the steel tube or penetrating the steel tube. Design guides, accounting for the effect of connection configuration on the strength of the connection, are not present. This study aims to investigate, through experimental testing and a parametric study, the influence of connection configuration on the strength of one sided branch plate-to-CHS members. A notable effect was observed on the behavior of the connections due to its detailing changes with respect to capacity, failure mode, ductility, and stress distribution. A parametric study is performed using the calibrated analytical model to include a wider range of parameters. The study involves 26 numerical analyses of finite element models including parameters of the diameter-to-thickness (D/t) ratio, length of gusset plate, and connection configuration. Accordingly, a modification to the formulas provided by the current design recommendations was suggested to include connection configuration effects for the one sided branch plate-to-CHS members.

Keywords: Branch plate; Circular hollow section; Connection; Steel structure; Tube.

660. Solving Civil Engineering Problems by Means of Fuzzy and Stochastic Mcdm Methods: Current State and Future Research

Jurgita Antucheviciene, Zdenjk Kala, Mohamed Marzouk and Egidijus Rytas Vaidogas

Mathematical Problems in Engineering, 2015: 1-16 (2015) IF: 0.762

The present review examines decision-making methods developed for dealing with uncertainties and applied to solve problems of civil engineering. Several methodological difficulties emerging from uncertainty quantification in decision-making are identified. The review is focused on formal methods of multiple criteria decision-making (MCDM). Handling of uncertainty by means of fuzzy logic and probabilistic modelling is analysed in light of MCDM. A sensitivity analysis of MCDM problems with uncertainties is discussed. An application of stochastic MCDM methods to a design of safety critical objects of civil engineering is considered. Prospects of using MCDM under uncertainty in developing areas of civil engineering are discussed in brief. These areas are design of sustainable and energy efficient buildings, building information modelling, and assurance of security and safety of built property. It is stated that before long the decision-making in civil engineering may face several methodological problems: the need to combine fuzzy and probabilistic representations of uncertainties in one decision-making matrix, the necessity to extend a global sensitivity analysis to all input elements of a MCDM problem with uncertainties, and an application of MCDM methods in the areas of civil engineering where decision-making under uncertainty is presently not common.

661. Decision Making Methods and Applications in Civil Engineering

Jurgita Antucheviciene, Zdenjk Kala, Mohamed Marzouk and Egidijus Rytas Vaidogas

Mathematical Problems in Engineering, 1-3 (2015) IF: 0.762

This special issue aims at providing recent developments about the decision making (DM) in the field of civil engineering. This field is vast and plays an important role in the life of modern society. A very large number of decisions must be made in the

life cycle of constructed objects. The decisions will be required in the time span starting from conceptualisation of these objects and covering design, construction, occupation, and decommissioning. Methods of DM can facilitate making these decisions in formal and not fully formal, partially intuitive way. The present special issue provides numerous examples on how can this be done. Articles published in this special issue prove that useful information for making construction related decisions can be obtained by methods which do not belong to a formal DM, for instance, sensitivity analysis, stochastic analysis, mathematical optimization, occupational safety, and risk assessment. Classical disciplines of engineering are also useful tool for facilitating decisions in civil engineering. However, all of these methods can be seen as means of providing input information for a formal DM.
Keywords: Decision making.

662. Simplified Procedure for Seismic Analysis of Base-Isolated Structures

Mohammed H. Serror, Sherif O. El-Gazzar and Sherif A. Mourad

Earthquakes and Structures, an International Journal, 8: 1091-1111 (2015) IF: 0.693

Base isolation is an effective method for protecting structures against earthquake hazard. It elongates the period of vibration and introduces supplemental damping to the structural system. The stiffness, damping and displacement are coupled forcing the code seismic design procedure to be unnecessarily complicated. In addition, the force reduction factor -a key parameter in the design procedure- has not been well addressed by seismic design codes at the high levels of damping due to the pronounced difference between pseudo and actual accelerations. In this study, a comparison has been conducted to evaluate eight different methods, in the literature, for calculating the force reduction factor due to damping. Accordingly, a simplified seismic analysis procedure has been proposed based on the well documented N2 method. Comprehensive analysis has been performed for base-isolated structure models for direct application and verification of the proposed procedure. The results have been compared with those of the European code EC8, the nonlinear time history analysis and investigations in the literature, where good agreement has been reported. In addition, a discussion has been elaborated for the resulted response of the base-isolated structure models with respect to the dynamic characteristics of the base isolation system.
Keywords: Base isolation; Force reduction factor; Damping; Seismic analysis.

663. Establishing Optimal Gap Size for Precast Beam Bridges with A Buffer-Gap-Elastomeric Bearings System

Mousa M.N. Farag, Sameh S.F. Mehanny and Mourad M. Bakhoum

Earthquakes and Structures, 9 (1): 195-219 (2015) IF: 0.693

A partial (hybrid) seismic isolation scheme for precast girder bridges in the form of a "buffer-gap-elastomeric bearings" system has been endorsed in the literature as an efficient seismic design system. However, no guides exist to detail an optimal gap size for different configurations. A numerical study is established herein

for different scenarios according to Euro code seismic requirements in order to develop guidelines for the selection of optimal buffer-gap arrangements for various design cases. Various schemes are hence designed for ductile and limited ductility behavior of the bridge piers for different seismic demand levels. Seven real ground records are selected to perform incremental dynamic analysis of the bridges up to failure. Bridges with typical short and high piers are studied; and different values of initial gaps at piers are also investigated varying from a zero gap (i.e., fully locked) condition up to an initial gap at piers that is three quarters the gap left at abutments. Among the main conclusions is that the as-built initial gaps at piers (and especially large gap sizes that are =1/2 as-built gaps at abutments) do not practically reduce the seismic design demand and do not affect the reserve capacity of the bridge against failure for bridges featuring long piers, especially when these bridges are designed a priori for ductile behavior. To the contrary, the "buffer-gap-elastomeric bearings" system is more effective for the bridge schemes with short piers having a large difference between the stiffness of the bearings and that of their supporting (much stiffer) squat piers, particularly for designs with limited ductility. Such effectiveness is even amplified for the case of larger initial as-built gap sizes at piers.
Keywords: Buffer; Gap; Elastomeric bearings; Seismic response; Ec8.

664. Study of Wind Tunnel Test Results of High-Rise Buildings Compared To Different Design Codes

Manar Mohamed Maher Hussein

Wind and Structures, 20: 623-642 (2015) IF: 0.584

Several international codes have been developed for evaluating wind loads on structures; however, the wind structure interaction could not be accurately captured by these codes due to the gusty nature of wind and the dynamic behavior of structures. Therefore, the alternative wind tunnel testing was introduced.
In this study, an introduction to the available approaches for wind load calculations for tall buildings was presented. Then, a comparative study between different codes: the Egyptian code, ECP 201-08, ASCE 7-05, BS 6399-2, and wind tunnel test results was conducted. An investigation has been carried out on two case studies tall buildings located within the Arabian Gulf region. Numerical models using (ETABS) software were produced to obtain the relation between codes analytical values and wind tunnel experimental test results for wind loads in the along and across wind directions.
Results for the main structural responses including stories forces, shears, overturning moments, lateral displacements, and drifts were presented graphically in order to give clear comparison between the studied methods. The conclusions and recommendations for future works obtained from this research are finally presented to help improving Egyptian code provisions and show limitations for different cases.
Keywords: Tall buildings; Wind tunnel test; Egyptian code; Asce 7-05; Bs 6399-2; Drift control.

Engineering Sector

665. Fuzzy Approach for Optimum Replacement Time of Mixed Infrastructures

Mohamed Marzouk and Ahmed Osama

Investments in infrastructure assets represent a sizable portion in the governments' public fund. Continuous maintenance, rehabilitation, and replacement are required to maintain the level of service of infrastructure assets. Knowing the replacement needs of infrastructures and the timing of replacement are challenging tasks. This paper presents a decision support tool that aids in deciding the best time to replace several types of infrastructure assets, that is, mixed infrastructure. The paper uses fuzzy logic to model uncertainties in order to identify the useful lifetime of each infrastructure asset. Infrastructure replacement decision is made based on least cost option(s). A fuzzy logic tool is applied in three steps: data fuzzification, fuzzy inference, and data defuzzification. The developments made in the fuzzy logic tool are presented. A numerical example is presented to demonstrate the practical features of the proposed tool.
Keywords: Mixed infrastructures; Infrastructure deterioration Rates; Fuzzy logic; Asset management.

Dept. of Systems and Biomedical Engineering

666. Genetic Case-Control Study for Eight Variants Associated with Rheumatoid Arthritis

Mohamed N. Saad, Mai S. Mabrouk, Ayman M. Eldeib and Olfat G. Shaker

Rheumatoid arthritis (RA) is an autoimmune disease which has a significant socio-economic impact. The aim of the current study was to investigate eight candidate RA susceptibility loci to identify the associated variants in Egyptian population. Eight single nucleotide polymorphisms (SNPs) (MTHFR—C677T and A1298C, TGF1 T869C, TNFB A252G, and VDR—ApaI, BsmI, FokI, and TaqI) were tested by genotyping patients with RA (n = 105) and unrelated controls (n = 80). Associations were tested using multiplicative, dominant, recessive, and co-dominant models. Also, the linkage disequilibrium (LD) between the VDR SNPs was measured to detect any indirect association. By comparing RA patients with controls (TNFB, BsmI, and TaqI), SNPs were associated with RA using all models. MTHFR C677T was associated with RA using all models except the recessive model. TGF1 and MTHFR A1298C were associated with RA using the dominant and the co-dominant models. The recessive model represented the association for ApaI variant. There were no significant differences for FokI and the presence of RA disease by the used models examination. For LD results, There was a high D0 value between BsmI and FokI (D0 = 0.91), but the r2 value between them was poor. All the studied SNPs may contribute to the susceptibility of RA disease in Egyptian population except for FokI SNP.
Keywords: Multiplicative model; Dominant model; Recessive model; Co-dominant model; Snp; Rheumatoid arthritis.

667. A Novel Technique for Cardiac Arrhythmia Classification Using Spectral Correlation and Support Vector Machines

Aya F. Khalaf, Mohamed I. Owis and Inas A. Yassine

Cardiac disorders are one of the main causes leading to death. Therefore, they require continuous and efficient detection techniques. ECG is one of the main tools to diagnose cardiovascular disorders such as arrhythmias. Computer aided diagnosis (CAD) systems play a very important role in early detection and diagnosis of cardiac arrhythmias. In this work, we propose a CAD system for classifying five beat types including: normal (N), Premature Ventricular Contraction (PVC), Premature Atrial Contraction (APC), Left Bundle Branch Block (LBBB) and Right Bundle Branch Block (RBBB). The proposed system is based on cyclostationary signal analysis approach, which explores hidden periodicities in the signal of interest and thus it is able to detect hidden features. In order to study the cyclostationarity properties of the signal, we utilized the spectral correlation as a nonlinear statistical transformation inspecting the periodicity of the correlation. Three experiments were investigated in our study; raw spectral correlation data were used in the first experiment while the other two experiments utilized statistical features for the raw spectral data followed by principal component analysis (PCA) and fisher score for feature space reduction purposes respectively. As for the classification task, support vector machine (SVM) with linear kernel was employed for all experiments. The experimental results showed that the approach that uses the raw spectral correlation data is superior compared to several state of the art methods. This approach achieved sensitivity, specificity, accuracy, positive predictive value (PPV) and negative predictive value (NPV) of 99.20%, 99.70%, 98.60%, 99.90% and 97.60% respectively.
Keywords: Electrocardiogram; Arrhythmia; Spectral correlation; Support vector machine; Classification.

668. Effect of MTHFR, TGFβ1, and TNFB Polymorphisms on Osteoporosis in Rheumatoid Arthritis Patients

Mohamed N. Saad, Mai S. Mabrouk, Ayman M. Eldeib and Olfat G. Shaker

Diseases of the immune and the skeletal systems should be studied together for the deep interaction between them. Many studies consider osteoporosis (OP) as a risk factor for the prediction of disease progression in rheumatoid arthritis (RA). The aim of this research is to study the effect of four single nucleotide polymorphisms (SNPs) on RA patients with and without OP. The examined SNPs (MTHFR (C677T, and A1298C), TGF1 (T869C), and TNFB (A252G))were tested by genotyping 17 RA patients with OP and 72 RA patients without OP. Associationswere tested using fourmodels (multiplicative, dominant, recessive, and co-dominant). The studied SNPs were not significantly associated with the risk of OP in RA. MTHFR, TGF1, and TNFB polymorphisms don't appear to be clinically useful genetic markers for predicting RA severity in Egyptian women population.

669. An Adaptive Displacement Estimation Algorithm for Improved Reconstruction of Thermal Strain

Xuan Ding, Debaditya Dutta, Ahmed M. Mahmoud, Bryan Tillman, Steven A. Leers and Kang Kim

Thermal strain imaging (TSI) can be used to differentiate between lipid and water-based tissues in atherosclerotic arteries. However, detecting small lipid pools in vivo requires accurate and robust displacement estimation over a wide range of displacement magnitudes. Phase-shift estimators such as Loupas' estimator and time-shift estimators such as normalized cross-correlation (NXcorr) are commonly used to track tissue displacements. However, Loupas' estimator is limited by phase-wrapping and NXcorr performs poorly when the SNR is low. In this paper, we present an adaptive displacement estimation algorithm that combines both Loupas' estimator and NXcorr. We evaluated this algorithm using computer simulations and an ex vivo human tissue sample. Using 1-D simulation studies, we showed that when the displacement magnitude induced by thermal strain was >/8 and the electronic system SNR was >25.5 dB, the NXcorr displacement estimate was less biased than the estimate found using Loupas' estimator. On the other hand, when the displacement magnitude was =/4 and the electronic system SNR was =25.5 dB, Loupas' estimator had less variance than NXcorr. We used these findings to design an adaptive displacement estimation algorithm. Computer simulations of TSI showed that the adaptive displacement estimator was less biased than either Loupas' estimator or NXcorr. Strain reconstructed from the adaptive displacement estimates improved the strain SNR by 43.7 to 350% and the spatial accuracy by 1.2 to 23.0% (P <; 0.001). An ex vivo human tissue study provided results that were comparable to computer simulations. The results of this study showed that a novel displacement estimation algorithm, which combines two different displacement estimators, yielded improved displacement estimation and resulted in improved strain reconstruction.

Keywords: Thermal strain; Atherosclerosis.

670. Classification of Voluntary Cough Airflow Patterns for Prediction of Abnormal Spirometry

Jeffrey S. Reynolds, W. Travis Goldsmith, Jeremy B. Day, Ayman A. Abaza, Ahmed M. Mahmoud, Ali A. Afshari, Jacob B. Barkley, E. Lee Petsonk, Michael L. Kashon and David G. Frazer

Measurement of partial expiratory flow-volume curves has become an important technique in diagnosing lung disease, particularly in children and in the elderly. The objective of this study was to investigate the feasibility of predicting abnormal spirometry using the partial flow-volume curve generated during a voluntary cough. Here, abnormal spirometry is defined as less than the lower limit of normal (LLN) predicted by standard reference equations [1]. Cough airflow signals of 107 subjects (56 male, 51 female) were previously collected [2] from patients performing spirometry in a pulmonary function clinic. A variety of features were extracted from the airflow signal. A support vector machine (SVM) classifier was developed to predict abnormal spirometry. Airflow signal features and SVM parameters were selected using a genetic algorithm. The ability of the classifier to distinguish between normal and abnormal spirometry based on cough flow was evaluated by comparing the classifiers decisions with the LLN for the given subject's spirometry, including forced expiratory volume in one second (FEV1), forced vital capacity (FV C), and their ratio (FEV1=FV C%). Findings indicated that it was possible to classify patients whose spirometry results were less than the LLN with an overall accuracy of 76% for FEV1, 65% for FV C, and 76% for the ratio FEV1=FV C%. Accuracies were determined by repeated double cross-validation [3]. This study demonstrates the potential of using airflow measured during voluntary coughing to identify test subjects with abnormal spirometry.

Keywords: Cough air-flow; Spirometry; Support vector machine.

671. The Design of 3D Scaffold for Tissue Engineering Using Automated Scaffold Design Algorithm

Shahenda Mahmoud, Ayman Eldeib and Sherif Samy

Several progresses have been introduced in the field of bone regenerative medicine. A new term tissue engineering (TE) was created. In TE, a highly porous artificial extracellular matrix or scaffold is required to accommodate cells and guide their growth in three dimensions. The design of scaffolds with desirable internal and external structure represents a challenge for TE. In this paper, we introduce a new method known as automated scaffold design (ASD) for designing a 3D scaffold with a minimum mismatches for its geometrical parameters. The method makes use of k-means clustering algorithm to separate the different tissues and hence decodes the defected bone portions. The segmented portions of different slices are registered to construct the 3D volume for the data. It also uses an isosurface rendering technique for 3D visualization of the scaffold and bones. It provides the ability to visualize the transplanted as well as the normal bone portions. The proposed system proves good performance in both the segmentation results and visualizations aspects.

Keywords: Tissue engineering; Scaffolds; Bone defect; Automated design; Medical imaging.

672. Ultra Wide Band Based Quantitative and Qualitative Method for Bacterial Endotoxin Detection

Muhammad Elsayeh and Ahmed H. Kandil

The existence of quick and accurate identification and detection methods for bacteria and bacterial endotoxin plays an important

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role in delivering high quality biomedical products. Healthcare institutions (Medical and Pharmaceutical) realized the importance of a quality control system to ensure the absence of pathogens and pyrogens in the medical products and equipment. The quality control systems used to identify and detect the bacteria and bacterial endotoxins lack speed or accuracy. This work presents a method that uses electromagnetic waves in the Ultra Wide Band (UWB) region of the microwave spectrum to detect and identify bacteria and bacterial endotoxins. The developed method is based on the properties of interaction between organic materials and electromagnetic waves. The interaction is measured quantitatively and qualitatively. The scattered parameters of sample networks are measured and cepstrum coefficients are estimated for the analysis of the scattered parameters signals' energies. Experimental results proved effective identification and detection of bacterial endotoxin even with concentrations as low as 0.0003 EU/ml; the developed method can be extended to detect and identify the presence of different bacteria.

Keywords: Rapid microbial detection; Rapid pyrogen detection; Microwave spectroscopy; Dielectric spectroscopy; Ultra wide band; Cepstrum analysis.

673. High Performance GPU-Based Fourier Volume Rendering

Marwan Abdellah, Ayman Eldeib and Amr Sharawi

Fourier volume rendering (FVR) is a significant visualization technique that has been used widely in digital radiography. As a result of its $\Theta(N^2 \log N)$ time complexity, it provides a faster alternative to spatial domain volume rendering algorithms that are $\Theta(N^3)$ computationally complex. Relying on the Fourier projection-slice theorem, this technique operates on the spectral representation of a 3D volume instead of processing its spatial representation to generate attenuation-only projections that look like X-ray radiographs. Due to the rapid evolution of its underlying architecture, the graphics processing unit (GPU) became an attractive competent platform that can deliver giant computational raw power compared to the central processing unit (CPU) on a per-dollar-basis. The introduction of the compute unified device architecture (CUDA) technology enables embarrassingly-parallel algorithms to run efficiently on CUDA-capable GPU architectures. In this work, a high performance GPU-accelerated implementation of the FVR pipeline on CUDA-enabled GPUs is presented. This proposed implementation can achieve a speed-up of 117x compared to a single-threaded hybrid implementation that uses the CPU and GPU together by taking advantage of executing the rendering pipeline entirely on recent GPU architectures.

Keywords: Image processing; Medical imaging; Gpu; Opengl; Fourier volume rendering; High performance.

674. Finite Element Based Model for the Assessment of A Prosthetic Foot Stiffness

A. H. Kandil, M. S. El-Mohandes and M. E. Ibrahem

Prosthetic foot stiffness behavior is not fixed. Its variation depends not only on the foot shape and material, but also on the

attitude of loads on the foot during walking. Many studies have evaluated foot stiffness by different ways. The purpose of this paper is to establish a new method for stiffness assessment depends on using finite element (FE) model for a Niagara foot at different load conditions that simulate what occurs in the gait. This technique is based on developing mathematical models of the force-displacement data, then the stiffness is determined mathematically corresponding to a set of four definite loads (250 N, 500 N, 750 N and 1000 N). Results showed that the developed technique was capable of determining the stiffness at any load. The modified models showed lower displacement and higher stiffness behavior compared with the Niagara Foot which provide less dynamic performance for the users with greater stability. The suggested technique simulated a methodology for a prosthetic foot designers to interactively vary the foot geometry or material and to track their effects on the stiffness properties and/or make comparisons. This technique can easily be standardized for evaluating the stiffness of any other type of prosthetic feet.

Keywords: Biomechanics; Finite element analysis; Prosthetic foot; Prosthesis; Stiffness.

Faculty of Computers and Information

Dept. of Computer Science (CS)

675. A Generalized Architecture of Quantum Secure Direct Communication for N Disjointed Users with Authentication

Ahmed Farouk, Magdy Zakaria, Adel Megahed and Fatma A. Omara

In this paper, we generalize a secured direct communication process between N users with partial and full cooperation of quantum server. So, N-1 disjointed users u_1, u_2, …, u_{N-1} can transmit a secret message of classical bits to a remote user uN by utilizing the property of dense coding and Pauli unitary transformations. The authentication process between the quantum server and the users are validated by EPR entangled pair and CNOT gate. Afterwards, the remained EPR will generate shared GHZ states which are used for directly transmitting the secret message. The partial cooperation process indicates that N-1 users can transmit a secret message directly to a remote user u_N through a quantum channel. Furthermore, N- 1 users and a remote user u_N can communicate without an established quantum channel among them by a full cooperation process. The security analysis of authentication and communication processes against many types of attacks proved that the attacker cannot gain any information during intercepting either authentication or communication processes. Hence, the security of transmitted message among N users is ensured as the attacker introduces an error probability irrespective of the sequence of measurement.

Keywords: A generalized architecture; Quantum secure direct communication.

676. Tumor Volume Fuzzification for Intelligent Cancer Staging

Ahmed S. Moussa and Sara A. Yones

Cancer staging has been regarded as a critical activity for cancer control. Cancer staging systems typically split tumors into 5 crisp categories. The classification of the tumor into one of the five stages significantly affects not only the treatment design and surgical decision for individuals but also cancer control for populations. Several cancer staging systems have been in use of which the TNM is the most widely applied. The acute distinction between the stages makes the staging unrealistic since the drastic modification in treatment based on a change of stage may be based on a slight shift around the stage boundary. Tumor size is the major component of staging systems. The TNM is no exception, where the T represents the size which is the dominant component of the staging system. In this paper we discuss the need for a fuzzy cancer staging system to capture the uncertainty and use it for more accurate treatment and medical decisions. The authors then focus on the size computation component of the cancer staging presenting a new approach depending on fuzzy volume computation. In the course, the authors demonstrate how the fuzzy volume can affect the staging system and, consequently, the medical treatment, decision, and possibly drug design.

Keywords: Fuzzy volume; Fuzzy image segmentation; Cancer staging; MR imaging; Alpha cut; Tumor size.

677. Image Classification and Retrieval Using Optimized Pulse-coupled Neural

Mona Mahrous Mohammed, Amr Badr and M.B. Abdelhalim

Content-Based Image Retrieval (CBIR) has become a powerful tool that is used in many image applications and search engines. Thus, many techniques and approaches for CBIR were developed in literature. The CBIR approach works on the visual features of the image rather than a descriptive text. Therefore, it provides more effective and efficient retrieval. On the other hand, PCNN has proved its efficiency as an image processing tool for various tasks such as image segmentation and recognition, feature extraction, edge and object detection. This article introduces a technique for content-based image classification and retrieval using PCNN. The proposed technique uses an optimized Pulse-Coupled Neural Network (PCNN) to extract the visual features of the image in a form of a numeric vector called image signature. An optimization mechanism was applied to the PCNN parameters in order to improve the signature quality. Thus improving the classification and retrieval results. Additionally, it employs the K-Nearest Neighbor (K-NN) algorithm for classification and matching. By applying classification before retrieval, the number of images in the search space is optimized to include one category instead of multiple categories. Moreover, we developed a CBIR prototype to validate our technique. The results show that our technique can retrieve and classify images efficiently. Furthermore, we evaluated our prototype against one of the widely used techniques and it was proven that the proposed technique can enhance the search results and improve the accuracy by 3.5%.

Keywords: Content-Based Image Retrieval (CBIR); Image classification; Visual features; Pulse-Coupled Neural Network (PCNN); Image signature; K-nearest neighbor; Genetic algorithm.

Dept. of Information System (IS)

678. Runtime Self-Monitoring Approach of Business Process Compliance in Cloud Environments

Ahmed Barnawi, Ahmed Awad, Amal Elgamma, Radwa El Shawi, Abdullah Almalaise and Sherif Sakr

Recently, several industrial studies have concluded that compliance management is one of the major challenges companies face nowadays. In practice, runtime compliance monitoring is of utmost importance for compliance assurance as during the design-time compliance checking phase, only a subset of the imposed compliance requirements can be statically checked due to the absence of required variable instantiation and contextual information. Furthermore, the fact that a business process model has been statically checked for compliance during design-time does not guarantee that the corresponding running business process instances are usually compliant due to human and machine errors. The problem of runtime monitoring of business process compliance becomes more challenging when business processes are executed in cloud computing environments. In this context, the compliance process can not rely on external components as the whole execution environment is mainly controlled by the cloud providers. In this article, we

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propose a novel approach to tackle this problem by adopting and configuring the business process models into a form that augment the associated compliance rules so that they can be monitored without the need to rely on external monitoring components. Compared to approaches that depend on an external monitoring component, our approach requires less sophisticated infrastructure when hosted on the cloud as well as less traffic footprint as communication with an external component for monitoring is no longer needed.

Keywords: Cloud computing; Cloud monitoring; Business process compliance.

Dept. of Information Technology (IT)

679. Using Machine Learning Techniques for Evaluating Tomato Ripeness

Nashwa El-Bendary, Esraa El Hariri, Aboul Ella Hassanien and Amr Badr

Tomato quality is one of the most important factors that helps ensuring a consistent marketing of tomato fruit. As ripeness is the main indicator for tomato quality from customers perspective, the determination of tomato ripeness stages is a basic industrial concern regarding tomato production in order to get high quality product. Automatic ripeness evaluation of tomato is an essential research topic as it may prove benefits in ensuring optimum yield of high quality product, this will increase the income because tomato is one of the most important crops in the world. This article presents an automated multi-class classification approach for tomato ripeness measurement and evaluation via investigating and classifying the different maturity/ripeness stages. The proposed approach uses color features for classifying tomato ripeness stages. The approach proposed in this article uses Principal Components Analysis (PCA) in addition to Support Vector Machines (SVMs) and Linear Discriminant Analysis (LDA) algorithms for feature extraction and classification, respectively. Experiments have been conducted on a dataset of total 250 images that has been used for both training and testing datasets with 10-fold cross validation. Experimental results showed that the proposed classification approach has obtained ripeness classification accuracy of 90.80%, using one-against-one (OAO) multi-class SVMs algorithm with linear kernel function, ripeness classification accuracy of 84.80% using one-against-all (OAA) multi-class SVMs algorithm with linear kernel function, and ripeness classification accuracy of 84% using LDA algorithm.

Keywords: Image classification; Features extraction; Ripeness; Principal Component Analysis (PCA); Support Vector Machines (SVMs); Linear Discriminant Analysis (LDA).

680. Dimensionality Reduction of Medical Big Data Using Neural-Fuzzy Classifier

Ahmad Taher Azar and Aboul Ella Hassanien

Massive and complex data are generated every day in many fields. Complex data refer to data sets that are so large that conventional database management and data analysis tools are insufficient to deal with them. Managing and analysis of medical big data involve many different issues regarding their structure, storage and analysis. In this paper, linguistic hedges neuro-fuzzy classifier with selected features (LHNFCSF) is presented for dimensionality reduction, feature selection and classification. Four real-world data sets are provided to demonstrate the performance of the proposed neuro-fuzzy classifier. The new classifier is compared with the other classifiers for different classification problems. The results indicated that applying LHNFCSF not only reduces the dimensions of the problem, but also improves classification performance by discarding redundant, noise-corrupted, or unimportant features. The results strongly suggest that the proposed method not only help reducing the dimensionality of large data sets but also can speed up the computation time of a learning algorithm and simplify the classification tasks.

Keywords: Takagi–Sugeno–Kang (TSK); Fuzzy inference system; Adaptive Neuro-Fuzzy Inference System (ANFIS); Linguistic Hedge (LH); Feature Selection (FS).

681. Optimized Hierarchical Routing Technique for Wireless Sensors Networks

Shaimaa Ahmed El-said, Asmaa and Aboul Ella Hassanien

Wireless sensor networks are battery-powered ad hoc networks in which sensor nodes that are scattered over a region connect to each other and form multi-hop networks. Since these networks consist of sensors that are battery operated, care has to be taken so that these sensors use energy efficiently.

This paper proposes an optimized hierarchical routing technique which aims to reduce the energy consumption and prolong network lifetime. In this technique, the selection of optimal cluster head (CHs) locations is based on artificial fish swarm algorithm that applies various behaviors such as preying, swarming, and following to the formulated clusters and then uses a fitness function to compare the outputs of these behaviors to select the best CHs locations.

To prove the efficiency of the proposed technique, its performance is analyzed and compared to two other well-known energy efficient routing techniques: low-energy adaptive clustering hierarchy (LEACH) technique and particle swarm optimized (PSO) routing technique. Simulation results show the stability and efficiency of the proposed technique.

Simulation results show that the proposed method outperforms both LEACH and PSO in terms of energy consumption, number of alive nodes, first node die, network lifetime, and total data packets received by the base station. This may be due to considering residual energies of nodes and their distance from base station , and alternating the CH role among cluster's members. Alternating the CH role balances energy consumption and saves more energy in nodes.

Keywords: Wireless Sensors Networks (WSN); Energy efficient routing techniques; Artificial Fish Swarm Algorithm (AFSA); Hierarchical routing technique.

682. Retinal Blood Vessel Localization Approach Based on Bee Colony Swarm Optimization, Fuzzy C-Means and Pattern Search

Aboul Ella Hassanien, E. Emary and Hossam M. Zawbaa

Accurate segmentation of retinal blood vessels is an important task in computer aided diagnosis and surgery planning of retinopathy. Despite the high resolution of photographs in fundus photography, the contrast between the blood vessels and retinal background tends to be poor. Furthermore, pathological changes of the retinal vessel tree can be observed in a variety of diseases such as diabetes and glaucoma. Vessels with small diameters are much liable to effects of diseases and imaging problems. In this paper, an automated retinal blood vessels segmentation approach based on two levels optimization principles is proposed. The proposed approach makes use of the artificial bee colony optimization in conjunction with fuzzy cluster compactness fitness function with partial belongness in the first level to find coarse vessels. The dependency on the vessel reflectance is problematic as the confusion with background and vessel distortions especially for thin vessels, so we made use of a second level of optimization. In the second level of optimization, pattern search is further used to enhance the segmentation results using shape description as a complementary feature. Thinness ratio is used as a fitness function for the pattern search optimization. The pattern search is a powerful tool for local search while artificial bee colony is a global search with high convergence speed. The proposed retinal blood vessels segmentation approach is tested on two publicly available databases DRIVE and STARE of retinal images. The results demonstrate that the performance of the proposed approach is comparable with state of the art techniques in terms of sensitivity, specificity and accuracy.
Keywords: Retinal blood vessel; Retinal vessel segmentation; Artificial bee colony; Pattern search; Fuzzy c-means; Swarm optimization; Clustering; Image enhancement.

683. A Novel Hybrid Binarization Technique for Images of Historical Arabic Manuscripts

Aboul Ella Hassanien Aly

This approach is used for historical Arabic manuscript images which have problems with types of noise. The input RGB image is changed into the NS domain, which is shown using three subsets, namely, the percentage of indeterminacy in a subset, the percentage of falsity in a subset and the percentage of truth in a subset. The entropy in NS is used for evaluating the indeterminacy with the most important operation " mean" operation in order to minimize indeterminacy which can be used to reduce noise. Finally, the manuscript is binarized using an adaptive thresholding technique. The main advantage of the proposed approach is that it preserves weak connections and provides smooth and continuous strokes. The performance of the proposed approach is evaluated both objectively and subjectively against standard databases and manually collected data base. The proposed method gives high results compared with other famous binarization approaches.

Keywords: Document image binarization; Historical manuscript image; Neutrosophic theory; Pixel classification.

684. Energy-Aware Sink Node Localization Algorithm for Wireless Sensor Networks

Mohamed Mostafa Fouad, Vaclav Snasel and Aboul Ella Hassanien

Wireless sensor networks (WSNs) are a family of wireless networks that usually operate with irreplaceable batteries. The energy sources limitation raises the need for designing specific protocols to prolong the operational lifetime of such networks. These protocols are responsible for messages exchanging through the wireless communications medium from the sensors to the base station (sink node). Therefore, the determination of the optimal location of the sink node becomes crucial to assure both the prolongation of the network's operation and the quality of the provided services. This paper proposes a novel algorithm based on a Particle Swarm Optimization (PSO) approach for designing an energy-aware topology control protocol. The deliverable of the algorithm is the optimal sink node location within a deployment area. The proposed objective function is based on a number of topology control protocol's characteristics such as numbers of neighbors per node, the nodes' residual energy, and how they are far from the center of the deployment area. The simulation results show that the proposed algorithm reveals significant effectiveness to both topology construction and maintenance phases of a topology control protocol in terms of the number of active nodes, the topology construction time, the number of topology reconstructions, and the operational network's lifetime.
Keywords: Energy-aware sink node localization; Wireless sensor Networks.

685. Intelligent Machine Learning in Image Authentication

Lamiaa M. El Bakrawy, Neveen I. Ghali and Aboul ella Hassanien

Image authentication techniques have recently gained great attention due to its importance for a large number of multimedia applications. Digital images are increasingly transmitted over non-secure channels such as the Internet. Therefore, military, medical and quality control images must be protected against attempts to manipulate them; such manipulations could tamper the decisions based on these im- ages. To protect the authenticity of multimedia images, there are several approaches including conventional cryptography, fragile and semi-fragile watermarking and dig- ital signatures that are based on the image content. The aim of this paper is to present a reviewon different Machine learning techniques as Fuzzy Set Theory, Rough Set Theory, Rough K-means clustering, Near Sets and Nearness Approximation Spaces, Vector quantization, Genetic Algorithm, Particle Swarm Optimization, Support Vec- tor Machine and applying them in image authentication.

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Keywords: Machine learning; Image authentication; Fuzzy set tTheory; Rough set theory; Rough k-means clustering; Near sets and nearness approximation spaces; Vector quantization; Genetic algorithm; Particle swarm optimization; Support vector machine.

686. On Securing Atomic Operations in Multicast AODV

Ahmed M. Abdel Moamen and Haitham S. Hamza

Multicast is an important communication pattern in Mobile Ad-hoc Network (MANET) that involves the transmission of packets to a group of two or more hosts, and thus can support group-oriented applications. Securing multicast routing in MANET is crucial in order to enable effective and efficient implementations of such applications. However, security techniques typically add more complexity to the protocol, and thus, may adversely impact its performance. Thus, a key objective in designing secure multicast routing protocols is to add security while reducing overhead. In this paper, we present a new approach, namely, the atomic security approach for securing the well-known Multicast Ad-hoc On-demand Distance Vector (MAODV). The underlying concept of the proposed approach is to secure basic (atomic) operations in the MAODV instead of the conventional approach of securing functional operations. Extensive simulation results show that the proposed approach based on securing atomic operations does not only decrease the byte overhead by 234% and improve Packet Delivery Ratio (PDR) by 16% as compared to conventional approaches, but it also provides a scalable framework to effectively and efficiently address future attacks on MAODV protocol.

Keywords: Mobile ad-hoc network (MANET); Multicast routing protocol; Security techniques; Multicast routing attacks; Maodv.

Institute of Statistical Studies and Research

Dept. of Computer Sciences and Information

787. Investigating the Effect of Fixing the Subset Length on the Performance of Ant Colony Optimization for Feature Selection for Supervised Learning

Nadia Abd-Alsabour

This paper studies the effect of fixing the length of the selected feature subsets on the performance of ant colony optimization (ACO) for feature selection (FS) for supervised learning. It addresses this concern by investigating: (1) determining the optimal feature subset from datamining perspective, (2) demonstrating the solution convergence in case of fixing the length of the selected feature subsets, (3) determining the subset length in ACO for subset selection problems, and (4) different stopping criteria when solving FS by ACO. Besides, two types of experiments on ACO algorithms for FS for classification and regression problems using artificial and real world datasets in two cases fixing and not fixing the length of the selected feature subsets with the use of a support vector machine. The obtained results showed that not fixing the length of the selected feature subsets is better than fixing the length of the selected feature subsets.

Keywords: Ant colony optimization; Feature selection; Subset problems; Supervised learning.

Dept. of Mathematical Statistics

788. Bivariate Inverse Weibull Distribution

Hiba Z. Muhammed

Recently it is observed that the inverse Weibull (IW) distribution can be used quite effectively to analyse lifetime data in one dimension. The main aim of this paper is to define a bivariate inverse Weibull (BIW) distribution so that the marginals have IW distributions. It is observed that the joint probability density function and the joint cumulative distribution function can be expressed in compact forms. Several properties of this distribution such as marginals, conditional distributions and product moments have been discussed. We obtained the maximum likelihood estimates for the unknown parameters of this distribution and their approximate variance– covariance matrix. We perform some simulations to see the performances of the maximum likelihood estimators. One data set has been re-analysed and it is observed that the bivariate IW distribution provides a better fit than the bivariate exponential distribution.

Keywords: Bivariate inverse weibull distribution; Product moments; Maximum likelihood estimators.

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3-1 Faculity of Medicine

3-2 Faculty of Oral & Dental Medicine

3-3 Faculty of Pharmacy

3-4 National Cancer Institute

3-5 Faculty of Physical Therapy

3-6 Faculty of Nursing

Faculty of Medicine

Dept. of Anatomy

789. The Effect of Mesenchymal Stem Cells and Chitosan Gel on Full Thickness Skin Wound Healing in Albino Rats: Histological, Immunohistochemical and Fluorescent Study

Abir O. El Sadik, Tarek A. El Ghamrawy and Tarek I. Abd El-Galil

Plos One, 10(9):e0137544: (2015) IF: 3.234

Background Wound healing involves the integration of complex biological processes. Several studies examined numerous approaches to enhance wound healing and to minimize its related morbidity. Both chitosan and mesenchymal stem cells (MSCs) were used in treating skin wounds. The aim of the current work was to compare MSCs versus chitosan in wound healing, evaluate the most efficient route of administration of MSCs, either intradermal or systemic injection, and elicit the mechanisms inducing epidermal and dermal cell regeneration using histological, immunohistochemical and fluorescent techniques.

Material and Methods Forty adult male Sprague Dawley albino rats were divided into four equal groups (ten rats in each group): control group (Group I); full thickness surgical skin wound model, Group II: Wound and chitosan gel. Group III: Wound treated with systemic injection of MSCs and Group IV: Wound treated with intradermal injection of MSCs. The healing ulcer was examined on day 3, 5, 10 and 15 for gross morphological evaluation and on day 10 and 15 for histological, immunohistochemical and fluorescent studies.

Results Chitosan was proved to promote wound healing more than the control group but none of their wound reached complete closure. Better and faster healing of wounds in MSCs treated groups were manifested more than the control or chitosan treated groups. It was found that the intradermal route of administration of stem cells enhanced the rate of healing of skin wounds better than the systemic administration to the extent that, by the end of the fifteenth day of the experiment, the wounds were completely healed in all rats of this group. Histologically, the wound areas of group IV were hardly demarcated from the adjacent normal skin and showed complete regeneration of the epidermis, dermis, hypodermis and underlyingmuscle fibers. Collagen fibers were arranged in many directions, with significant increase in their area percent, surrounding fully regenerated hair follicles and sebaceous glands in the dermis of the healed areas more than in other groups.

Conclusion MSCs enhanced the healing process of wound closure more than chitosan gel treatment. Furthermore, MSCs injected intradermally, were more efficient in accelerating wound healing than any other mode of treatment.

790. Concomitant Protective and Therapeutic Role of Verapamil in Chronic Mercury Induced Nephrotoxicity in the Adult Rat: Histological, Morphometric and Ultrastructural Study

Nabila Yousef Abdel Haleem, Hoda Mahmoud El-Aasar, Sherif Mohamed Zaki, Sherif Mohamed Sabry and Ahmed Wafiq El-Zainy

Arch Med Sci, 11(1): 199-209 (2015) IF: 2.03

Introduction: Mercury intoxication is a widespread problem as mercury is used in the manufacture of thermometers, batteries and electrical switches. It forms one of the most diffusible environmental pollutants. Mercury has a nephrotoxic effect which could occur at low exposure levels. Verapamil could help in the treatment of mercuric toxicity. The aim of the study was to examine the protective and therapeutic effect of concomitant verapamil on chronic mercuric chloride nephrotoxicity. This was done through histological, morphometric and transmission electron microscopic studies.

Material and Methods: Sixty adult male albino rats were used. The rats were divided into a control group and 4 experimental groups: group I (HgCl2), group II (concomitant HgCl2 and verapamil), group III (HgCl2 withdrawal) and group IV (HgCl2 withdrawal then verapamil treatment).

Results: Chronic administration of HgCl2 resulted in cortical nephrotoxic effects in the form of glomerular sclerosis, acute tubular necrosis and interstitial inflammatory cellular infiltration which eventually ended in interstitial fibrosis. Concomitant use of verapamil with HgCl2 improved the previous pathological changes partially. The findings in group III were less severe compared to group IV. The persistence of the pathological findings in these groups reflects the irreversible nephrotoxic changes caused by chronic HgCl2 exposure.

Conclusions: We concluded that the concomitant administration of verapamil has a much better effect in minimizing the nephrotoxic effect caused by chronic HgCl2 than its therapeutic administration. So, we recommended the prophylactic use of verapamil in suspected cases of chronic mercuric chloride nephrotoxicity to preserve renal function.

Keywords: Verapamil chronic mercury nephrotoxicity.

791. The Effect of Liquid Diet on the Parotid Gland and the Protective Role of L-Carnitine: Immunohistochemical and Ultrastructural Study

Tarek A. ElGhamrawy

Folia Morphologica, 74(1): 42-9 (2015) IF: 0.336

Background: The moisture content of diet and the dryness of the mouth alter the volume of parotid saliva secreted in rats and it plays an important part in mastication and swallowing. Temporary or permanent liquid diet feeding provides a nutritional regime for patients in certain medical situations. The aim of the present work is to investigate the sequel of liquid diet on parotid gland in rats and the possible protective role of L-carnitine (L-car).

Materials and Methods: Thirty adult male albino rats were divided into three groups (10 per group) — Control group: rats were fed on regular pellet diet, Liquid diet group and Liquid diet supplemented with L-car group were received liquid diet. The parotid glands were dissected for histological, immunohistochemical and ultrastructural analysis.

Results: By light microscope, liquid fed group showed some areas with degenerated irregularly shaped acini and atrophic acini with vacuolated cytoplasm and pyknotic nuclei. Acinar cells of parotid gland group on liquid diet supplemented with L-car, had normally eosinophilic cytoplasm with few vacuoles in their acinar cells. Periodic acid Schiff (PAS) staining, in liquid fed group showed that the serous acini were weakly stained with PAS that was localised in the apical portion of the cells where the secretory granules lie with lack of staining of the vacuoles. However,

moderately stained acinar epithelial cell and fewer vacuoles was seen in group given liquid diet supplemented with L-car. Immunohistochemistry of Caspase 3 showed more apoptotic cells with increased area per cent of Caspase 3 immunoexpression, seen in the acini and more in the ductal epithelium in liquid fed group. It was markedly reduced in the acinar cells in group on liquid diet supplemented with L-car. Electron microscopic study revealed in liquid fed group acini with multiple cytoplasmic vacuoles and reduced secretory granules, degenerated swollen mitochondria and dilated cisternae of endoplasmic reticulum. Degenerated condensed nuclear mass or indented nuclear membrane, nuclei with karyorrhexis and chromatin material leaked in the cytoplasm with rupture of the nuclear membranes were also seen. In parotid gland of liquid fed group supplemented with L-car, acinar cells showed normally distributed secretory granules and few cytoplasmic vacuoles. They showed normal appearance of the nuclei and their cytoplasmic organelles. **Conclusions**: Liquid diet caused cellular degenerative damages and apoptotic changes in parotid gland and these changes can be prevented by L-car supplementation probably by its antioxidant properties. (Folia Morphol 2015; 74, 1: 42–49)
Keywords: Parotid; Liquid diet; L-carnitine; Caspase 3; Ultrastructure.

792. Efficiency of Selenium in Attenuating Epididymal Histopathological Changes in Hypercholesterolaemic Adult Rat

F.A. Abdel Gawad, E.A.A. El-Shaarawy, A.A. Rizk, W.M. Sayed and R.A. Emam

Folia Morphologica, 74 (3): 295-302 (2015) IF: 0.336

Background: Studies on sperm maturation, epididymal histology, or epididymal tubule physiology are significant parts in reproductive researches. The present study was aimed to evaluate the effect of induced hypercholesterolaemia on the epididymis of adult albino rats and to clarify the possible protective role of selenium.
Materials and Methods: Forty adult albino Wistar rats were divided into four groups; untreated control group (group I), sham control (group II), group with induced hypercholesterolaemia (group III), group with induced hypercholesterolaemia treated with selenium 0.25 mg/kg/day (group IV).
Results: Histological and ultrastructural examination of the epididymal epithelial cells of hypercholesterolaemic rats (group III) showed loss of cilia with many vacuolations, fatty degenerative changes and increased collagen fibres. Morphometrically significant increase (p < 0.0001) in the per cent area of collagen fibres with no significant change in the optical density of periodic acid Schiff reaction (p > 0.05). Selenium treated group (group IV) produced marked improvement in histological, ultrastructural and morphometric Results as compared with group III.
Conclusions: It could be concluded that hypercholesterolaemia produced deleterious effects to the epididymis and selenium could attenuate these effects.
Keywords: Epididymis; Histopathology; Hypercholesterolaemia; Selenium.

793. Prevalence of Obesity Among Male Adolescents in Arar Saudi Arabia: Future Risk of Cardiovascular Disease

Shehab A Alenazi, Hala M Koura, Sherif M Zaki and Ayman H Mohamed

Indian Journal of Community Medicine, 40(3): 182-187 (2015)

Background: Obesity in adolescence is crucial as it represents an important stage in human life. Dietary habits are greatly associated with lifestyle. Many reports suggested direct relationship between adolescent fatness and increased risk of cardiovascular diseases (CVD) which will be found in young adult population. AIM: Determine the prevalence of overweight and obesity among male adolescents in Arar city, Saudi Arabia (KSA). We estimated the future risk of developing cardiovascular diseases in this age-group and its possible correlation to different lifestyles and dietary habits.
Results: A total of 523 male students with a mean age of 16.7 ± 0.9 years participated in the current study in which 30.4% of those students were obese and 17.2% were overweight. A direct relationship was found between body weight and different dietary and lifestyle habits. The risk of CVD based on waist height ratio (WHtR) was found in 33.5% of participants (30.4% obese, 2.1% overweight and 1% normal weight); moreover, the risk of CVD was strongly related to different dietary and lifestyle habits. **Conclusion**: Overweight and obesity were high among adolescent male students in Arar, who became susceptible to the risk of CVD. Arar showed the highest rate of obesity all over KSA. Both obesity and risk of CVD were strongly related to bad dietary habits and lifestyle.
Keywords: Ardiovascular; Disease; Lifestyle; Obesity.

Dept. of Andrology & Sexology

794. Relationship of Paternal Age with Outcome of Percutaneous Epididymal Sperm Aspiration-Intracytoplasmic Sperm Injection, in Cases of Congenital Bilateral Absence of the Vas Deferens

Samir Elhanbly, Moustafa A. El-Saied, Mohamed Fawzy, Abdelaziz El-Refaeey and Taymour Mostafa

Fertilitry Sterility, 104: 602-606 (2015) IF: 4.59

Objective To assess the relationship between paternal age and the outcome of percutaneous epididymal sperm aspiration-intracytoplasmic sperm injection (ICSI) in patients with congenital bilateral absence of the vas deferens (CBAVD).
Design: Prospective cohort study.
Setting: In vitro fertilization centers.
Patient(S): Eighty-five (male) CBAVD patients who underwent percutaneous epididymal sperm aspiration with ICSI were divided into 3 age groups; <30 years (n = 27); aged 30-40 years (n = 32); and aged >40 years (n = 26).
Intervention(S): History taking, clinical examination, semen analysis, percutaneous epididymal sperm aspiration with subsequent ICSI.
Main Outcome Measure (S): Sperm retrieval, clinical pregnancy, and "take-home baby."
Result(S): The number of sperm retrieved by percutaneous epididymal sperm aspiration significantly decreased with advancing age in the studied groups (0.63, 0.31, and 0.18 million,

respectively), concomitant with significant decreases in the outcomes of clinical pregnancy (55.5%, 43.7%, and 23.1%, respectively) and "take-home baby" (48.1%, 40.6%, and 11.5%, respectively). Male age was significantly negatively correlated with retrieved sperm count, sperm motility, sperm vitality, and normal sperm morphology. Multiple logistic regression, adjusted for confounding factors, with male age, and sperm count obtained using percutaneous epididymal sperm aspiration, was significant. The receiver operating characteristic curve showed that a sperm count of 0.55 million as a cutoff value could predict clinical pregnancy with an accuracy of 77.4%, with 82.9% sensitivity and 62% specificity, and "take-home baby" with an accuracy of 81.7%, with 93.1% sensitivity and 62.5% specificity. **Conclusion**(S): In cases of CBAVD, male age has a negative effect on retrieved-sperm count, motility, vitality, and normal sperm morphology; number of retrieved sperm predicted both clinical pregnancy and "take-home baby" outcomes in subsequent ICSI.
Keywords: Male infertility; ICSI; PESA; CBAVD; Semen.

795. Priapism as A Result of Chronic Myeloid Leukemia: Case Report, Pathology, and Review of the Literature

Osama Kamal Zaki Mahmoud Shaeer, Kamal Zaki Mahmoud Shaeer, Islam Fathy Soliman AbdelRahman, Mostafa Shawky El-Haddad and Osama Mohamed Selim

Introduction: Priapism is rare-presenting feature in male patients with chronic myeloid leukemia (CML). Several hypotheses for pathogenesis have been described. Management has been controversial; some authors described resolution following priapism-specific interventions, and others recommended addition of CML-specific therapy or even CML-specific therapy alone.
Aim: In this report, we describe presentation and management of a man with refractory priapism that was the first presenting manifestation of CML. We also report, for the first time, the pathology sections of the sinusoidal tissue in such cases. Literature is reviewed for similar cases and their outcome.
Methods: A 21-year-old male patient presented with painful priapism that started 6 days earlier and failed aspiration-irrigation. CBC revealed marked leucocytosis. Oncology care diagnosed CML, and treatment with Imatinib was commenced with prior semen cryopreservation. Following remission, a penile prosthesis was implanted, assisted by optical corporotomy. Sinusoidal tissue biopsy was stained by hematoxylin/eosin (H&E) and CD34.
Main Outcome Measures: Pathology sections of cavernous tissue following CML-induced priapism.
Results: The penile implant survived without complications. H&E examination of the sinusoidal tissue biopsy revealed leukemic infiltration associated with vascular endothelial damage. CD34 staining showed the mixed picture of leukemic infiltrates, intact vascular endothelium with lumena showing leukemic cells, alternating with destroyed vessels, and no vascular lumena and ruminants of endothelial cells.
Conclusion: Priapism can be the first manifestation of previously undetected CML. The pathological picture of sinusoidal tissue in such cases is presented. In the case at hand, a complete blood picture was helpful in early diagnosis of CML and early initiation of targeted chemotherapy along with the

corporal irrigation/aspiration or shunt surgery. It is therefore recommended to have a CBC examined at presentation of any case of ischemic priapism of unknown etiology, early initiation of CML therapy along with aspiration/irrigation, preferably cryopreserving a semen sample before CML therapy
Keywords: Priapism; CML; Chronic myeloid leukemia.

796. The International Society for Sexual Medicine'S Process of Care for the Assessment and Management of Testosterone Deficiency in Adult Men

John D. Dean, Chris G. McMahon, Andre T. Guay, Abraham Morgentaler, Stanley E. Althof, Edgardo F. Becher, Trinity J. Bivalacqua, Arthur L. Burnett, Jacques Buvat, Amr El Meliegy, Wayne J.G. Hellstrom, Emmanuele A. Jannini, Mario Maggi, Andrew McCullough, Luiz Otavio Torres and Michael Zitzmann

Introduction: In 2014, the International Society for Sexual Medicine (ISSM) convened a panel of experts to develop an evidence-based process of care for the diagnosis and management of testosterone deficiency (TD) in adult men. The panel considered the definition, epidemiology, etiology, physiologic effects, diagnosis, assessment and treatment of TD. It also considered the treatment of TD in special populations and commented on contemporary controversies about testosterone replacement therapy, cardiovascular risk and prostate cancer.
Aim: The aim was to develop clearly worded, practical, evidenced-based recommendations for the diagnosis and treatment of diagnosis and management of TD for clinicians without expertise in endocrinology, such as physicians in family medicine and general urology practice.
Method: A comprehensive literature review was performed, followed by a structured, 3-day panel meeting and 6-month panel consultation process using electronic communication. The final guideline was compiled from reports by individual panel members on areas reflecting their special expertise, and then agreed by all through an iterative process.
Results: This article contains the report of the ISSM TD Process of Care Committee. It offers a definition of TD and recommendations for assessment and treatment in different populations. Finally, best practice treatment recommendations are presented to guide clinicians, both familiar and unfamiliar with TD.
Conclusion: Development of a process of care is an evolutionary process that continually reviews data and incorporates the best new research. We expect that ongoing research will lead to new insights into the pathophysiology of TD, as well as new, efficacious and safe treatments. We recommend that this process of care be reevaluated and updated by the ISSM in 4 years.
Keywords: Assessment of hypogonadism; Etiology of hypogonadism; Hypogonadism; Testosterone deficiency; Treatment of hypogonadism.

797. Ropporin Gene Expression in Infertile Asthenozoospermic Men with Varicocele Before and after Repair

Medhat K. Amer, Rashad M. Mostafa, Amal Fathy, Hany M. Saad and Taymour Mostafa

Objective: To assess Ropporin gene expression in the sperm of infertile asthenozoospermic men with varicocele (Vx) before and after repair.

Methods: This study included 24 infertile asthenozoospermic men with Vx. They were subjected to history taking, clinical examination, scrotal color Doppler, and semen analysis with sperm separation. Three months after varicocelectomy, they were subjected to postoperative color Doppler, semen analysis, and sperm semiquantitative Reverse Transcription-Polymerase Chain Reaction assay for Ropporin gene expression levels.

Results: Ropporin gene expression is significantly associated with different types of sperm motility, except for nonprogressive sperm motility. There was significant Ropporin gene overexpression postvaricocelectomy that was correlated with improved sperm count, sperm motility, and abnormal sperm morphology with decreased veins diameters.

Conclusion: Ropporin gene expression is related to the sperm motility. Its abnormal expression in the sperm of asthenozoospermic men with Vx is associated with impaired sperm motility that is improved after varicocelectomy.

Keywords: Male infertility; Semen; Ropporin gene; Oat.

798. Endothelial Nitric Oxide Synthase Gene Polymorphism Relationship with Semen Parameters and Oxidative Stress in Infertile Oligoasthenoteratozoospermic Men

Taymour Mostafa, Laila A. Rashed, Nashaat Nabil, Hanan Fouad, Dina Sabry and Dalia M. El-Saied

Objective: To assess endothelial nitric oxide synthase (eNOS) gene polymorphism relationship with semen parameters and oxidative stress in infertile oligoasthenoteratozoospermic (OAT) men.

Materials and Methods: Three hundred subjects were divided into healthy fertile men (n = 80) and infertile OAT men (n = 220). They were subjected to history taking, clinical examination, and semen analysis in addition to malondialdehyde and glutathione peroxidase estimation in seminal plasma. Polymorphisms of eNOS G894T and T786C genotypes in peripheral blood were identified by the polymerase chain reaction-restriction fragment length polymorphism analysis.

Results: Comparing infertile OAT men with fertile controls, eNOS genotype G894T demonstrated prevalence of 36.8% vs 50% for wild type (GG), 35.0% vs 47.5% for heterozygous type (GT), and 28.2% vs 2.5% for mutant homozygous type (TT). Compared with GG homozygotes, carriers with A allele exhibited >1.716-fold increased risk of OAT occurrence. Comparing infertile OAT men with fertile controls, eNOS genotype T786C demonstrated prevalence of 37.3% vs 51.3% for wild type (TT), 32.7% vs 45% for heterozygous type (TC), and 30% vs 3.7% for mutant type (CC) with significant differences. Compared with TT homozygotes, carriers with C allele exhibited >1.769-fold increased risk of OAT occurrence. G894T and T786C genotypes demonstrated significant negative correlation with sperm count, total sperm motility, sperm normal forms, and seminal glutathione peroxidase, and significant positive correlation with seminal malondialdehyde. G894T genotype demonstrated significant positive correlation with T786C genotype.

Conclusion: There is a significant relationship between eNOS genotypes T786C, G894T polymorphisms with decreased sperm parameters and increased seminal oxidative stress.

Keywords: Male infertility; Semen; Enos; Polymorphism.

799. Impact of the Mode of Delivery on Female Sexual Function after Childbirth

M.A. Eid, A. Sayed, R. Abdel-Rehim and T. Mostafa

This cohort study aimed to assess the effect of the mode of delivery on female sexual function (FSF) after childbirth. Out of 256 primiparous women, 200 subjects that completed the study were divided into two groups; women that delivered vaginally and women that had elective cesarean section (CS). They were subjected to a translated version of female sexual function index (FSFI) questionnaire evaluating desire, lubrication, orgasm, satisfaction, pain both antenatally and 12 weeks postpartum. The mean FSFI total score of the two investigated groups demonstrated nonsignificant difference 12 weeks after delivery compared with these scores antenatally. Women that delivered vaginally demonstrated significant decreases in the scores of desire, arousal and lubrication domains 12 weeks after delivery compared with these scores antenatally where other scores demonstrated nonsignificant differences. Women that delivered by CS demonstrated a significant difference in desire domain 12 weeks after delivery compared with these scores antenatally where other scores demonstrated nonsignificant differences. It is concluded that the mode of delivery has nonsignificant effect on the FSF 12 weeks after childbirth. Specifically, vaginal delivery is associated with significant decrease in the desire, arousal and lubrication domains where elective CS is associated with significant decrease in the desire domain.

Keywords: Female sexual dysfunction; Pregnancy; Delivery; Desire.

800. Cytochrome P450-2D6*4 Polymorphism Seminal Relationship in Infertile Men

A. Zalata, A. Z. El-Samanoudy, G. Osman, S. Elhanbly, H. A. Nada and T. Mostafa

This study aimed to assess cytochrome (CY) P450-2D6*4 polymorphism relationship with semen variables in infertile men. In all, 308 men were included; fertile normozoospermia (N) (n = 77), asthenozoospermia (A) (n = 70), asthenoteratozoospermia (AT) (n = 75) and oligoasthenoteratozoospermia (OAT) (n = 86). They were subjected to history taking, clinical examination, semen analysis, sperm acrosin activity, seminal malondialdehyde (MDA) and CYP450-2D6*4 genotyping. CYP450-2D6*4 wild-type allele was represented in 76.5% of N, 70% of A, 66.7% of AT and 57.7% of OAT men where homozygous gene mutation was present in 5.9% of N, 20% of A, 26.6% of AT and 26.9% of OAT men, respectively. Sperm acrosin activity, sperm concentration, sperm motility, linear sperm velocity and sperm normal forms were significantly higher, and seminal MDA level was significantly lower in men with CYP450-2D6*4 wild-type allele compared with men with homozygous mutation. It is concluded that CYP450-2D6*4 wild-type allele has higher

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frequency where homozygous-type allele has lower frequency in N men compared with A, AT and OAT men. Sperm acrosin activity index, sperm concentration, sperm motility, linear sperm velocity and sperm normal forms were significantly higher, and seminal MDA level was significantly lower in men with CYP450-2D6*4 wild-type allele compared with men with homozygous mutation.

Keywords: Acrosin activity; Cytochrome 450; Male infertility; Polymorphism; Semen.

801. Seminal Plasma Oxytocin and Oxidative Stress Levels in Infertile Men with Varicocele

T. Mostafa, L. A. Rashed, I. Osman and M. Marawan

This study aimed to assess seminal plasma oxytocin (OT) and oxidative stress (OS) levels in infertile men with varicocele (Vx). A total of 131 men were divided into fertile men (n = 20), fertile men with Vx (n = 17), infertile men without Vx (n = 40) and infertile men with Vx (n = 54). OT, malondialdehyde (MDA) and glutathione peroxidase (GPx) were estimated in seminal plasma. Mean levels of seminal OT, MDA were significantly decreased, and the mean level of GPx was significantly increased in fertile men with/without Vx compared with infertile men with/without Vx. Mean levels of OT, MDA were increased, and mean level of GPx was significantly decreased in Vx grade III cases compared with Vx grades I, II cases and in bilateral Vx cases compared with unilateral Vx. There was significant negative correlation between seminal OT with sperm count, sperm motility, seminal GPx and significant positive correlation with sperm abnormal forms, seminal MDA. It is concluded that seminal OT is significantly decreased in fertile men with/without Vx compared with infertile men with/without Vx. Seminal OT demonstrated significant negative correlation with sperm count, sperm motility, seminal GPx and significant positive correlation with sperm abnormal forms, seminal MDA. Seminal OT is associated with Vx grade and its bilaterality.

Keywords: Male infertility; Oxidative stress; Oxytocin; Semen; Varicocele.

802. Penile Length-somatometric Parameters Relationship in Healthy Egyptian Men

M. E. Shalaby, A. E.-R. M. Almohsen, A. R. El Shahid, M. T. Abd Al-Sameaa and T. Mostafa

This study aimed to assess the penile length-somatometric parameters relationship in healthy Egyptian men. Two thousand physically normal men (22-40 years) were subjected to measurement of stretched penile length, glans penis, testis size, index finger, weight, height, span, body mass index (BMI), waist circumference, hip circumference and waist/hip ratio. The mean stretched penile length of the studied subjects was 13.84 ± 1.35 cm (range 12-19 cm), and the mean glans penis length was 2.6 ± 0.4 cm (range 1.7-3.8 cm). Penile length demonstrated positive significant correlation with glans penis length, index finger length, BMI and significant negative correlation with waist/hip ratio. On the other hand, penile length demonstrated nonsignificant correlation with age, weight, height, waist circumference, span or testicular size. It is concluded that the penile length-somatometric parameters relationship in healthy Egyptian men is mostly related to glans penis and index finger lengths.

Keywords: Glans penis; Index finger; Penis; Somatometrics; Testis.

803. Glutathione-s-transferase-oxidative Stress Relationship in the Internal Spermatic Vein Blood of Infertile Men with Varicocele

T. Mostafa, L. A. Rashed, A. S. Zeidan and A. Hosni

This study aimed to assess glutathione-S-transferase (GST) enzyme- oxidative stress (OS) relationship in the internal spermatic vein (ISV) of infertile men associated with varicocele (Vx). Ninety five infertile oligoasthenoteratozoospemic (OAT) men associated with Vx were subjected to history taking, clinical examination and semen analysis. During inguinal varicocelectomy, GST, malondialdehyde (MDA) and glutathione peroxidase (GPx) were estimated in the blood samples drawn from ISV and median cubital veins. The mean levels of GST, GPx were significantly decreased and the mean level of GPx was significantly increased in the ISV compared with the peripheral blood. The mean level of GST and GPx in the ISV was significantly decreased, and the mean level of MDA was significantly increased in Vx grade III compared with Vx grade II cases. There was nonsignificant difference in the mean level of GST in the ISV in unilateral Vx cases compared with bilateral Vx cases. There was significant positive correlation of GST with sperm count, sperm motility, GPx and significant negative correlation with sperm abnormal forms, MDA. It is concluded that ISV of infertile men associated with Vx has decreased levels of GST compared with peripheral venous circulation that is correlated with both OS and Vx grade.

Keywords: Glutathione-s-transferase; Internal spermatic vein; Male infertility; Oxidative stress; Varicocele.

804. in Vitro Effect of Cell Phone Radiation on Motility, DNA Fragmentation and Clusterin Gene Expression in Human Sperm

Adel Zalata, Ayman Z El-Samanoudy, Dalia Shaalan, Youssef El-Baiomy and Taymour Mostafa

Background: Use of cellular phones emitting radiofrequency electromagnetic field (RF-EMF) has been increased exponentially and become a part of everyday life. This study aimed to investigate the effects of in vitro RF-EMF exposure emitted from cellular phones on sperm motility index, sperm DNA fragmentation and seminal clusterin (CLU) gene expression. **Materials and Methods**: In this prospective study, a total of 124 semen samples were grouped into the following main categories: i. normozoospermia (N, n=26), ii. asthenozoospermia (A, n=32), iii. asthenoteratozoospermia (AT, n=31) and iv. oligoasthenoteratozoospermia (OAT, n=35). The same semen samples were then divided into two portions non-exposed and exposed samples to cell phone radiation for 1 hour. Before and immediately after exposure, both aliquots were subjected to different assessments for sperm motility, acrosin activity, sperm

DNA fragmentation and CLU gene expression. Statistical differences were analyzed using paired t student test for comparisons between two sub-groups where p<0.05 was set as significant.

Results: There was a significant decrease in sperm motility, sperm linear velocity, sperm linearity index, and sperm acrosin activity, whereas there was a significant increase in sperm DNA fragmentation percent, CLU gene expression and CLU protein levels in the exposed semen samples to RF-EMF compared with non-exposed samples in OAT>AT>A>N groups, respectively (p<0.05).

Conclusion: Cell phone emissions have a negative impact on exposed sperm motility index, sperm acrosin activity, sperm DNA fragmentation and seminal CLU gene expression, especially in OAT cases.

Keywords: Cell phone; Electromagnetic radiation; Sperm motility; Spermatozoa.

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805. Association Between Surgical Indications, Operative Risk, and Clinical Outcome in Infective Endocarditis A Prospective Study from the International Collaboration on Endocarditis

Vivian H., Lawrence P. Park, Eugene Athan, Francois Delahaye, Tomas Freiberger, Cristiane Lamas, Jose M. Miro, Daniel W. Mudrick, Jacob Strahilevitz, Christophe Tribouilloy, Emanuele Durante-Mangoni, Juan M. Pericas, Nuria Fernández-Hidalgo, Francisco Nacinovich, Hussien Rizk, Vladimir Krajinovic, Efthymia Giannitsioti, John P. Hurley, Margaret M. Hannan and Andrew Wang

Background: Use of surgery for the treatment of infective endocarditis (IE) as related to surgical indications and operative risk for mortality has not been well defined.

Methods and Results: The International Collaboration on Endocarditis–PLUS (ICE-PLUS) is a prospective cohort of consecutively enrolled patients with definite IE from 29 centers in 16 countries. We included patients from ICE-PLUS with definite left-sided, non–cardiac device–related IE who were enrolled between September 1, 2008, and December 31, 2012. A total of 1296 patients with left-sided IE were included. Surgical treatment was performed in 57% of the overall cohort and in 76% of patients with a surgical indication. Reasons for nonsurgical treatment included poor prognosis (33.7%), hemodynamic instability (19.8%), death before surgery (23.3%), stroke (22.7%), and sepsis (21%).

Among patients with a surgical indication, surgical treatment was independently associated with the presence of severe aortic regurgitation, abscess, embolization before surgical treatment, and transfer from an outside hospital. Variables associated with nonsurgical treatment were a history of moderate/severe liver disease, stroke before surgical decision, and Staphyloccus aureus etiology. The integration of surgical indication, Society of Thoracic Surgeons IE score, and use of surgery was associated with 6-month survival in IE.

Conclusions: Surgical decision making in IE is largely consistent with established guidelines, although nearly one quarter of patients with surgical indications do not undergo surgery. Operative risk assessment by Society of Thoracic Surgeons IE score provides prognostic information for survival beyond the operative period. S aureus IE was significantly associated with nonsurgical management.

Keywords: Endocarditis; Infection; Mortality; Surgery; Valve.

806. When A Thrombus is Life-saving

Abdalla Elagha and Azza Farag

A 37-year-old previously healthy man, a manual sugarcane juicer who lives in a rural area, presented with a 1-month history of atypical chest pain in his left shoulder area and a 2-week history of breathlessness on moderate exertion. On admission, the patient was tachycardic and tachypneic and had a blood pressure of 90/60 mm Hg with pulsus paradoxus. Physical examination showed elevated jugular venous pressure and distant heart sounds. ECG revealed ST-segment elevation in the anterior precordial leads (Figure 1A), but his troponin level was normal. Chest x-ray demonstrated an increased cardiothoracic ratio with a flask-shape appearance (Figure 1B). Echocardiography demonstrated massive pericardial effusion with signs of tamponade, left ventricular mass, and dyskinetic apex (Figure 1C and Movie I in the online-only Data Supplement). On the basis of previous investigations, urgent pericardiocentesis was performed; 2000 cm3 of hemorrhagic fluid was aspirated and sent for laboratory investigations. One day later, reaccumulation of pericardial fluid occurred. Cardiac magnetic resonance imaging was requested for further investigations. Surprisingly, a small area of perforation in the dyskinetic apex was demonstrated (Figure 2A). Uncommonly, this perforation was sealed from the inside rather than outside by a left ventricular thrombus, slowing the amount of blood escaping the left ventricular cavity and improving the prognosis (Figure 2B and Movie II in the online-only Data Supplement). Moreover, delayed-hyperenhancement images clearly showed the scar in the left ventricular apex and adjacent segments, with the nonenhanced thrombus overlying it (Figure 2C). Urgent coronary angiography showed total proximal left anterior descending artery occlusion (Figure 3), after which urgent surgical intervention was performed. In the operating room, magnetic resonance imaging findings were confirmed, and a left ventricular aneurysmectomy (Figure 4A), evacuation of a huge mural thrombus (Figure 4B), ventricular reconstruction (Figure 4C), and a left internal mammary artery graft to the left anterior descending artery were performed. When myocardial infarction is complicated by myocardial rupture, usually it occurs within 2 weeks of onset.1 If not diagnosed early and treated promptly, it is fatal.2 However, in this educational case, the formation of a large apical thrombus in the left ventricle overlying the site of myocardial rupture offered a sealing mechanism that decreased the rate of bleeding into the pericardium and temporarily saved the patient from sudden collapse and death.

807. Impact of Early Valve Surgery on Outcome of Staphylococcus Aureus Prosthetic Valve Infective Endocarditis: Analysis in the International Collaboration of Endocarditis-prospective Cohort Study

Hussien Rizk

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Background: The impact of early valve surgery (EVS) on the outcome of Staphylococcus aureus (SA) prosthetic valve infective endocarditis (PVIE) is unresolved. The objective of this study was to evaluate the association between EVS, performed within the first 60 days of hospitalization, and outcome of SA PVIE within the International Collaboration on Endocarditis–Prospective Cohort Study.

Methods: Participants were enrolled between June 2000 and December 2006. Cox proportional hazards modeling that included surgery as a time-dependent covariate and propensity adjustment for likelihood to receive cardiac surgery was used to evaluate the impact of EVS and 1-year all-cause mortality on patients with definite left-sided S. aureus PVIE and no history of injection drug use.

Results: EVS was performed in 74 of the 168 (44.3%) patients. One-year mortality was significantly higher among patients with S. aureus PVIE than in patients with non–S. aureus PVIE (48.2% vs 32.9%; P = .003). Staphylococcus aureus PVIE patients who underwent EVS had a significantly lower 1-year mortality rate (33.8% vs 59.1%; P = .001). In multivariate, propensity-adjusted models, EVS was not associated with 1-year mortality (risk ratio, 0.67 [95% confidence interval, .39–1.15]; P = .15).

Conclusions: In this prospective, multinational cohort of patients with S. aureus PVIE, EVS was not associated with reduced 1-year mortality. The decision to pursue EVS should be individualized for each patient, based upon infection-specific characteristics rather than solely upon the microbiology of the infection causing PVIE.

Keywords: Endocarditis; Prosthetic valve; Surgery; 1-Year mortality.

808. One-year Outcome Following Biological or Mechanical Valve Replacement for Infective Endocarditis

Hussien Rizk

Background: Nearly half of patients require cardiac surgery during the acute phase of infective endocarditis (IE). Wedescribe the characteristics of patients according to the type of valve replacement (mechanical or biological), and examine whether the type of prosthesis was associated with in-hospital and 1-year mortality.

Methods and Results: Among 5591 patients included in the International Collaboration on Endocarditis Prospective Cohort Study, 1467 patients with definite IE were operated on during the active phase and had a biological (37%) or mechanical (63%) valve replacement. Patients who received bioprostheses were older (62 vs 54 years), more often had a history of cancer (9% vs 6%), and had moderate or severe renal disease (9% vs 4%); proportion of health care-associated IE was higher (26% vs 17%); intracardiac abscesseswere more frequent (30% vs 23%). In-hospital and 1-year death rateswere higher in the bioprosthesis group, 20.5% vs 14.0% (p= 0.0009) and 25.3% vs 16.6% (p b .0001), respectively. In multivariable analysis, mechanical prostheses were less commonly implanted in older patients (odds ratio: 0.64 for every 10 years), and in patients with a history of cancer (0.72), but were more commonly implanted in mitral position (1.60). Bioprosthesis was independently associated with 1-year mortality (hazard ratio: 1.298).

Conclusions: Patients with IE who receive a biological valve replacement have significant differences in clinical characteristics compared to patients who receive a mechanical prosthesis. Biological valve replacement is independently associated with a higher in-hospital and 1-year mortality, a result which is possibly related to patient characteristics rather than valve dysfunction.

Keywords: Infective endocarditis; Surgery; Valve prosthesis.

809. Scar Characteristics for Prediction of Ventricular Arrhythmia in Ischemic Cardiomyopathy

Sherif Gouda, Amir Abdelwahab, Mohamed Salem and Magdy Abdel Hamid

Background Better risk-stratification tools are needed to identify the best candidates for implantable cardioverter defibrillator implantation. Infarct characterization by cardiac magnetic resonance (CMR) has become an evolving potential tool for risk stratification. Objective   We assessed the ability of scar characteristics by CMR in patients with postinfarction left ventricular (LV) dysfunction to predict sustained monomorphic ventricular tachycardia (SMVT). Methods Forty-eight patients with postinfarction LV dysfunction underwent CMR study. Twenty-four patients had history of SMVT and the other 24 were control group and underwent electrophysiological study to assess SMVT inducibilty. Various scar characteristics were assessed in the spontaneous SMVT group and were compared with the inducible and noninducible SMVT groups. Results Only six patients in the control group had inducible SMVT. In univariable analysis, total scar (absolute and as percent of LV), scar core (absolute and as percent of LV), peri-infarct zone (absolute and as percent of LV), mean infarct transmurality, and number of segments with late gadolinium enhancement (LGE) were statistically significant predictors of spontaneous SMVT experience and SMVT inducibility. In multivariable analysis, total infarct as percent of LV mass was the only significant independent predictor of spontaneous SMVT experience (odds ratio [OR] 1.33 per% change, 95% confidence interval [CI] 1.12–1.6, P = 0.001) and SMVT inducibility (OR 1.3 per% change, 95% CI 1.1–1.6, P = 0.004). Conclusion Characterization of myocardial infarct by LGE-CMR, specifically total infarct size, is better predictor of spontaneous SMVT experience and SMVT inducibility than LV ejection fraction.

Keywords: Sudden cardiac death; Ventricular tachycardia; Ischemic cardiomyopathy; Cardiac magnetic resonance.

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810. Mutations in Recombination Activating Gene 1 and 2 in Patients with Severe Combined Immunodeficiency Disorders in Egypt

Safa Meshaal, Rabab El Hawarya, Marwa Elsharkawy, Reem K. Mousaa, Reem J. Farid, Dalia Abd Elaziz, Radwa Alkady, Nermeen Galal, Michel J. Massaad, Jeannette Boutros and Aisha Elmarsafy

The Recombination Activating Genes (RAG) 1/2 are important for the development and function of T and B cells. Loss of RAG1/2 function Results in severe combined immunodeficiency (SCID), which could lead to early death. We studied the prevalence of RAG1/2 mutations in ten SCID patients in Egypt. We identified two novel homozygous nonsense mutations in RAG1, a novel homozygous deletion, and a previously reported homozygous missense mutation from four patients, as well as two homozygous mutations in RAG2 from the same patient. Prenatal diagnosis performed in the mother of a patient with RAG1 deficiency determined that the fetus was heterozygous for the same mutation. This represents the first report on RAG1/2 mutations in SCID patients in Egypt. The early diagnosis dramatically affects the outcome of the disease by allowing bone marrow transplantation at an early age, and providing prenatal diagnosis and genetic counseling for families with a history of SCID.

Keywords: Egypt; Omenn syndrome; Prenatal diagnosis; Rag; Severe combined immunodeficiency.

Dept. of Clinical & Chemical Pathology

811. Potential Genetic Markers for Prediction of Treatment Response in Egyptian Children Infected with HCV Genotype 4

Normeen Hany Rady, Rania Kamal Darwish, Engy Adel Mogahed, Iman Atef Mandour, Hazem Abo Youssef, Sahar Abdel Atty Sharaf and Hanaa Mostafa El-Karaksy

Background: Egypt has a high prevalence of hepatitis C virus (HCV) infection. Limitations of the current HCV treatment in children are low rate of sustained virological response, significant side effects and high expenses, making prediction of treatment response crucial.Aim: This study aimed to investigate association of single nucleotide polymorphisms (SNPs) in interleukins (IL) 10, 28 and 29 genes in predicting the response to therapy in HCV infected children.
Methods: Sixty-six Egyptian children infected with HCV genotype 4, receiving pegylated interferon alpha 2b and ribavirin, were included. Genotyping of six SNPs in interleukin 10, 28B and 29 gene as well as HCV genotype were analyzed by real-time polymerase chain reaction.
Results: The CC genotype in IL28B; rs12979860 had 8.547 folds higher chance to develop sustained virological response than CT and TTgenotypes (P = 0.014). Genotype distribution of rs8099917 in IL28B gene (TG and GGgenotypes) was found to be 3.348 more likely not to respond to treatment than the TTgenotype (P = 0.018). In multivariate analysis, interleukin 28 gene single nucleotide polymorphisms rs 12979860, interleukin 10 single nucleotide polymorphisms -592A > Cand basal viral load were independent variables that significantly improved prediction of response to HCV therapy.
Conclusion: This association can be translated into clinical decision making for HCV treatment.
Keywords: Children; HCV; Interleukin 10; Interleukin 28; SNPs.

812. Assessment of Interleukin 28B Genotype as A Predictor of Response to Combined Therapy with Pegylated Interferon Plus Ribavirin in HCV Infected Egyptian Patients

Mona M. Fathy, Mohamed E. Abo Taleb, Mohamed S. El Hawary, Mona I. Nabih, Wael M. Aref and Manal M. Makhlouf

Background and Aim: Single nucleotide polymorphisms (SNPs) of interleukin 28B (IL28B) gene is associated with spontaneous clearance and variable response to combined therapy with pegylated interferon (PEG-IFN) and ribavirin (RBV) in chronic hepatitis C virus (HCV) infected patients. This study aimed at assessing the value of IL28B rs8099917 gene polymorphism in predicting sustained virological response (SVR) among HCV infected Egyptian patients treated with PEG-IFN and RBV.
Methods: Our study was conducted on 153 chronic HCV infected patients treated with PEG-IFN and RBV. Genotyping of rs8099917 near the IL-28B gene wasperformedby Real Time PCR using Taq-Man probe assay.
Results: The overall SVR was achieved in 49.6% of patients. Patients with TT genotype showed significantly higher SVR rate than minor allele (TG/GG) carriers (74% vs. 26%, P = 0.004). Logistic regression analysis revealed that TT carriers had 2.8 higher chance for SVR achievement than G allele carriers TG/GG (OR = 2.8, 95% CI = 1.4–5.6, P = 0.004). Younger age, male sex and low activity grading were significant predictors of SVR (P = 0.003, P = <0.001 and P < 0.001 respectively). High pretreatment AST levels and advanced liver fibrosis were negative predictors of SVR (P = 0.04 and P < 0.001 respectively).
Conclusion: IL28B genotype is a significant pre-treatment predictor of response to PEG-IFN/RBV in HCV infected Egyptian patients.
Keywords: Interleukin 28B; Genotype; Real time PCR; Interferon λ.

813. Impact of Serology and Molecular Methods on Improving the Microbiologic Diagnosis of Infective Endocarditis in Egypt

Amany Aly El‑Kholy, Nevine Gamal El‑din El‑Rachidi, Mervat Gaber El‑Enany, Eiman Mohammed AbdulRahman, Reem Mostafa Mohamed and Hussien Hasan Rizk

Background Conventional diagnosis of infective endocarditis (IE) is based mainly on culture-dependent Methods that may fail because of antibiotic therapy or fastidious microorganisms. Objectives We aimed to evaluate the added values of serological and molecular Methods for diagnosis of infective endocarditis. Patients and Methods One hundred and fifty-six cases of suspected endocarditis were enrolled in the study. For each patient, three sets of blood culture were withdrawn and serum sample was collected for Brucella, Bartonella and Coxiella burnetii antibody testing. Galactomannan antigen was added if fungal endocarditis was suspected. Broad range PCR targeting bacterial and fungal pathogens were done on blood culture bottles followed by sequencing. Culture and molecular studies were done on excised valve tissue when available. Results One hundred and thirty-two cases were diagnosed as definite IE. Causative organisms were detected by blood cultures in 40 (30.3 %) of

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cases. Blood culture-negative endocarditis (BCNE) represented 69.7 %. Of these cases, PCR followed by sequencing on blood and valvular tissue could diagnose five cases of Aspergillus flavus. Eleven patients with BCNE (8.3 %) were diagnosed as zoonotic endocarditis by serology and PCR including five cases of Brucella spp, four cases of Bartonella spp and two cases ofCoxiella burnetii. PCR detected three cases of Brucella spp and two cases of Bartonella spp, while cases of Coxiella burnetii were PCR negative. The Results of all diagnostic tools decreased the percentage of non-identified cases of BCNE from 69.7 to 49.2 %. Conclusion Our data underline the role of serologic and molecular tools for the diagnosis of blood culture-negative endocarditis.

Keywords: Blood culture-negative endocarditis; Brucella Spp; Broad Range PCR.

814. Plasma Circulating Cell-free Nuclear and Mitochondrial DNA as Potential Biomarkers in the Peripheral Blood of Breast Cancer Patients

Enas H Mahmoud, Amal Fawzy, Omar K Ahmad and Amr M Ali

Background: In Egypt, breast cancer is estimated to be the most common cancer among females. It is also a leading cause of cancer-related mortality. Use of circulating cell-free DNA (ccf-DNA) as non-invasive biomarkers is a promising tool for diagnosis and follow-up of breast cancer (BC) patients. Objective To assess the role of circulating cell free DNA (nuclear and mitochondrial) in diagnosing BC.

Materials and Methods: Multiplex real time PCR was used to detect the level of ccf nuclear and mitochondrial DNA in the peripheral blood of 50 breast cancer patients together with 30 patients with benign lesions and 20 healthy controls. Laboratory investigations, histopathological staging and receptor studies were carried out for the cancer group. Receiver operating characteristic curves were used to evaluate the performance of ccf-nDNA and mtDNA.

Results: The levels of both nDNA and mtDNA in the cancer group were significantly higher in comparison to the benign and the healthy control group. There was a statistically significant association between nDNA and mtDNA levels and well established prognostic parameters; namely, histological grade, tumour stage, lymph node status andhormonal receptor status.

Conclusions: Our data suggests that nuclear and mitochondrial ccf-DNA may be used as non-invasive biomarkers in BC.

Keywords: Breast cancer; Ccf nuclear DNA; CCF mitochondrial DNA diagnostic markers.

815. The Role of Ompk 35, Ompk 36 Porins, and Production of β-Lactamases on Imipenem Susceptibility in Klebsiella Pneumoniae Clinical Isolates, Cairo, Egypt

Mona Wassef, Mona Abdelhaleim, Eiman AbdulRahman and Doaa Ghaith

Background: OmpK35 and OmpK36 are the major outer membrane porins of Klebsiella pneumoniae. We aimed to study the effect of combined porin loss and production of extended-spectrum β-lactamases (ESBLs) on imipenem susceptibility among K. pneumoniae clinical isolates.

Materials and Methods: This study included 91 suspected ESBL-producing K. pneumoniae clinical isolates, isolated from different patient specimens at the Cairo University hospital from January to June 2010. All isolates were subjected to genotypic analysis of the outer membrane protein gene expression using reverse transcription-PCR (RT-PCR) and analysis of OmpK35/36 of 38 isolates by sodium dodecyl sulfate–polyacrylamide gel electrophoresis (SDS-PAGE).

Results: By RT-PCR, loss of Omp35 was detected in 78 (85.7%) isolates, loss of Omp36 was detected in 64 (70.32%), and loss of both porins was detected in 62 (68.1%). Out of 91 isolates, 45 (49.5%) were resistant to cefoxitin, and 17 (18.7%) were confirmed as derepressed AmpC producers. Omp35 was lost in all FOX-resistant isolates, whereas Omp36 was lost in 42 (93.3%) (p-value 0.002). The mean of ceftazidime inhibition zone diameter was significantly decreased among ESBL-producing isolates with loss of Omp35/36 (p-value 0.041 and 0.006), respectively. The mean of imipenem minimal inhibitory concentration (MIC) was markedly increased to 8.55µg/ml among AmpC-producing isolates with Omp35/36 loss, while the mean of imipenem MIC among the 66 confirmed ESBL producers was 0.32µg/ml.

Conclusion: Imipenem MIC was markedly increased among K. pneumoniae isolates showing AmpC production with loss of both porins OmpK35/36. Meanwhile, the association of porin OmpK35/36 loss with ESBL production was not a direct cause of resistance to imipenem.

Keywords: K. Pneumoniae, Omp35-Omp36-ESBL-imi resistance.

816. Sex Chromosome Mosaicism in the Gonads of DSD Patients: A Karyotype/ Phenotype Correlation

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Sex chromosome mosaicism Results in a large clinical spectrum of disorders of sexual development (DSD). The percentage of 45,X cells in the developing gonad plays a major role in sex determination. However, few reports on the gonadal mosaic status have been published, and the phenotype is usually correlated with peripheral lymphocyte karyotypes, which makes the phenotype prediction imprecise. This study was conducted on 7 Egyptian DSD patients to demonstrate the effect of sex chromosome constitution of both blood lymphocytes and gonadal tissues on the phenotypic manifestations. Conventional cytogenetic and FISH analyses of blood lymphocytes were conducted, and laparoscopy with gonadal biopsy was performed for histopathologic examination and FISH analysis. Gonosomal mosaicism was detected in 3 patients who had a non-mosaic chromosome pattern in blood lymphocytes. Two patients showed the same type of sex chromosome mosaicism in both the blood and gonadal tissues but with different distributions. Two other patients revealed a non-mosaic pattern in both tissues. The present study elucidates the importance of examining sex chromosome mosaicism in gonadal tissues of DSD patients and highlights the critical role of 45,X mosaicism which can lead to serious effects during early gonadal organogenesis.

Keywords: Disorders of sexual development; FISH; Gonadal mosaicism; SRY; 45,X mosaicism.

817. Antimicrobial Stewardship to Optimize the use of Antimicrobials for Surgical Prophylaxis in Egypt: A Multicenter Pilot Intervention Study

Tamer Saied, Soad F. Hafez, Amr Kandeel, Amany El-kholy, Ghada Ismail, Mariam Aboushady, Ehab Attia, Ahmed Hassaan, Ossama Abdel-Atty, Elham Elfekky, Samia A. Girgis, Afaf Ismail, Enjy Abdou, Omar Okasha and Maha Talaat

Objective To measure the impact of an antimicrobial stewardship (AMS) program on the use of antibiotics for surgical prophylaxis at acute care hospitals in Egypt.
Methods: This was a before-and-after intervention study conducted in 5 tertiary, acute-care surgical hospitals. The baseline, intervention, and follow-up periods were 3, 6, and 3 months, respectively. The impact of the intervention was measured by preintervention and postintervention surveys for surgical patients with clean and clean-contaminated wounds. Information was collected on demographic characteristics and antibiotic use. The intervention focused mainly on educating surgical staff on the optimal timing and duration of antibiotics used for surgical prophylaxis. Only 3 hospitals identified a surgeon to audit antibiotic surgical prescriptions. The primary outcome measures were the percentages of surgical patients receiving optimal timing and duration of surgical prophylaxis.
Results: Data were collected for 745 patients before the intervention and for 558 patients after the intervention. The optimal timing of the first dose improved significantly in 3 hospitals, increasing from 6.7% to 38.7% (P <.01), from 2.6% to 15.2% (P <.01), and from 0% to 11% (P <.01). All hospitals showed a significant rise in the optimal duration of surgical prophylaxis, with an overall increase of 3%-28% (P < .01). Days of therapy per 1000 patient-days were decreased significantly in hospitals A, B, C, and D, with no change in hospital E.
Conclusions: An AMS program focusing on education supported by auditing and feedback can have a significant impact on optimizing antibiotic use in surgical prophylaxis practices.
Keywords: Antimicrobial stewardship; Preoperative antibiotic prophylaxis; Antibiotics in Egypt.

818. Birth Weight, Insulin Resistance, and Blood Pressure in Late Preterm Infants

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Objectives: This study aims to compare insulin sensitivity, lipid profile, and blood pressure in late preterm infants born at appropriate for gestational age (AGA) and small for gestational age (SGA).
Study Design: We conducted a prospective, observational study on AGA and SGA late preterm infants. Blood pressure, fasting blood glucose, insulin, insulin-like growth factor 1 (IGF-1), insulin resistance, and lipid profile were measured on the 1st day and in the 2nd week of life.

Results: Results Overall 81 infants (41 AGA and 40 SGA) were included in the study. At the time of enrollment, there was no difference in blood pressure, insulin resistance, and lipid profile. At follow-up SGA patients had significantly decreased diastolic blood pressure (48 ± 11 mm Hg vs. 42 ± 11 mm Hg, p ¼ 0.04), and decreased IGF-1 (139 ng/mL [119–153] vs. 124 ng/mL [115–138], p ¼ 0.05). No linear association was found between the insulin resistance and either birth weight percentile, day of life, or average 1st week daily caloric intake.
Conclusion: As compared with AGA, SGA late preterm infants had lower diastolic blood pressure and lower IGF-1 during the 2nd week of life, but similar insulin resistance and lipid profile. We speculate that although metabolic derangements in SGA infants could have occurred at a much earlier age in fetal life, their manifestations may not be present in the immediate postnatal life.
Keywords: Glucose; SGA; Metabolic syndrome; Premature; Nutrition.

819. Association of Genetic Polymorphism of Pre-MicroRNA-146A rs2910164 and Serum High-Mobility Group Box 1 with Febrile Seizures in Egyptian Children

Marianne Samir Makboul Issac, Marian Girgis, Mervat Haroun and Amal Shalaby

Interaction between immune-inflammatory process and genetic factors might be implicated in the pathogenesis of febrile seizures. Pre-microRNA (miR)-146a rs2910164 polymorphism is postulated to modulate expression of miR-146a whose anti-inflammatory role involves regulation of high-mobility group box 1. Our aim is to examine whether rs2910164 polymorphism influences serum high-mobility group box 1 levels and whether an association exists between both and febrile seizures. The study included 136 children, divided into 4 groups. Real-time polymerase chain reaction was used for detection of rs2910164 polymorphism and high-mobility group box 1 was measured using enzyme-linked immunosorbent assay. High-mobility group box 1 levels were higher in febrile seizure patients compared to the other groups. Rs2910164 polymorphism was not associated with increased risk of febrile seizures. Rs2910164 polymorphism might be accompanied by an upregulation of the proinflammatory process as it might be associated with an increase in high-mobility group box 1 and leukocytic count.
Keywords: MiRNA-146a; Nc_000005.10; High-mobility group box 1; Febrile convulsions.

820. Clinical and Quality Evaluation of Apheresis Vs Random-donor Platelet Concentrates Stored for 7 Days

E. Hussein

Background and Objectives: The clinical efficacy of different types of platelets remains under debate. We conducted a pilot study to prospectively evaluate the impact of subsequent storage on the in vitro quality and post-transfusion outcome of apheresis prepared platelets (APCs) vs random donor platelets (RDPs).

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Materials and Methods: We studied 30 units of APCs, and 30units of RDPs. We performed assays on days 1, 3, 5 and 7, evaluating ADP aggregation, platelet count and pH. Fifteen thrombocytopenic patients with haematologic conditions were evaluated. Each patient received prophylactic transfusions of both components, and their post-transfusion platelet increments were compared. Twenty-five transfusions were apheresis prepared, and 35 transfusions were received as RDPs. None of the RDPs were leukoreduced.

Results: The median platelet counts for APCs on days 1, 3, 5 and 7 were; 2070, 1990, 1680 and 1240×10^3 μL^{-1}, respectively, and were; 1290, 850, 499 and 284×10^3 μL^{-1}, respectively for RDPs. The pH of all units was more than $6 \cdot 2$. Both groups demonstrated a significant decrease of ADP aggregation after 3 days of storage (P $<0 \cdot 05$). However, APCs provided satisfactory increments for $90 \cdot 9\%$ of transfusions. On the sixth and seventh days of storage, APCs provided significantly higher platelet increments ($18 \cdot 7 \times 10^3$ μL^{-1}) compared with RDPs ($3 \cdot 20 \times 10^3$ μL^{-1}) (P $<0 \cdot 05$). Significantly longer transfusion intervals were also achieved with APCs (P $<0 \cdot 05$).

Conclusion: Although other variables may have confounded the Results, subsequent storage of APCs appeared to provide higher increments with longer intervals of transfusion compared with RDPs. Future prospective studies are needed, adjusting for other possible confounding variables.

Keywords: Apheresis platelets; Platelet aggregation; Platelet increments; Random donor platelets.

821. The Role of MDR-Acinetobacter Baumannii in Orthopedic Surgical Site Infections

Sohier Helal, Mervat El Anany, Doaa Ghaith and Samar Rabeea

Surgical Infections, 16: 518-522 (2015) IF: 1.448

Background: Gram-positive microorganisms were the main causative organisms of orthopedic surgical site infections (SSI); however the rising incidence of multiple drug resistant Acinetobacter baumannii (MDR-AB) infections in orthopedic operations causes a great concern because of their limited array of therapeutic options. Objective Our objective was to remark the changing microbiology in orthopedic SSI and to evaluate the MDR CHROMagar Acinetobacter media for screening of MDR-AB.

Methods: Aspirated pus samples were collected from infected wounds of 100 patients in the orthopedics unit of El-Helal Hospital, samples were cultured on conventional media and MDR CHROMagar Acinetobacter media, the reveled MDR-AB colonies were subjected to polymerase chain reaction (PCR) to detect blaOXA-51 like gene.

Results: Out of 100 infected wounds SSI cases represented 90/100 (90%) according to CDC 2013 definitions. Staphylococcus aureus was the dominant organism 40/90 (44.4%) (P value 0.038), all S. aureus isolates were methicillin-resistant Staphylococcus aureus (MRSA), followed by Klebsiella pneumoniae 22/90 (24.44%) and Acinetobacter 15/90 (16.67%). Implant was highly associated with SSI cases 80/90 (89%). Also, prolonged hospital stay >7d was significantly associated with SSI 69/90 (77%) (p=0.001).

Conclusion: Staphylococcus aureus was the main causative organism of orthopedic SSI (44.4%), whereas A. baumannii represented only (16.67%) of the causative organisms. MDR

Acinetobacter CHROMagar reduced the turnaround time for screening of MDR-AB.

Keywords: MDR acinetobacter baumannii; Orthopedic SSI; MDR chromagaracinetobacter.

822. Inducible Nitric Oxide Synthase Promoter Polymorphism: A Molecular Susceptibility Marker for Vitiligo in Egyptians

Amira A. Zayed, Mervat M. Khorshied and Marwa F. Hussein

International Journal of Dermatology, 54(6): 675-679 (2015) IF: 1.312

Background: Vitiligo is a depigmentary disease characterized by loss of melanocytes from the skin and mucous membranes. The pathomechanism of vitiligo is still obscure. Inducible nitric oxide synthase (iNOS) produces very large amounts of nitric oxide (NO). Promotor polymorphisms within iNOS gene have been reported to be associated with overproduction of NO, which may induce melanocyte destruction.

Aim: The current study aimed at investigating the possible association between iNOS gene polymorphism (-954 G/C and Ex 16+14 C/T) and susceptibility to non-segmental vitiligo in a cohort of Egyptians.

Methods: The study was conducted on 200 participants: 100 patients with vitiligo and 100 aged matched healthy controls. Polymerase chain reaction using restriction fragment length polymorphism method (PCR-RFLP) was used to identify the genotypes.

Results: Our Results showed that iNOS -954 G/C heteromutant genotype (GC) was associated with increased risk of vitiligo (OR = 3.35, 95% CI = 1.77-6.33), and the risk increased when confined to females (OR = 7.4, 95% CI = 2.80-19.40). iNOS Ex 16 + 14 C/T heteromutant genotype (CT) conferred two folds increased risk of vitiligo (OR = 2.47, 95% CI = 1.39-4.37). Furthermore, the risk of vitiligo increased when the heteromutant genotype of iNOS -954 G/C (GC) was co-inherited with the wild genotype of iNOS Ex16+14 C/T (CC) (OR = 23.2, 95% CI = 3.04-177.21).

Conclusions: Inducible nitric oxide synthase -954 G/C and Ex 16+14 C/T might be considered as genetic susceptibility markers for non-segmental vitiligo among Egyptians.

Keywords: iNOS; Polymorphism; Vitiligo; Egypt.

823. Study of Prognostic Significance of Marrow Angiogenesis Assessment in Patients with De Novo Acute Leukemia

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Hematology, 20: 504-510 (2015) IF: 1.253

Background: Angiogenesis is the highly ordered formation of new blood vessels from pre-existing vessels. It is seen throughout growth, in wound healing, menses, and is important in cancer, where pro- and antiangiogenic signals can be released by cancer cells, endothelial cells, stromal cells, blood, and the extracellular matrix. Aim of the study is to use standardized method for counting blood vessels to verify the significance and prognostic

value of assessing marrow angiogenesis at diagnosis of de novo acute leukemia.

Subjects and Methods: The study included 70 newly diagnosed acute leukemia cases and a control group composed of 35 bone marrow biopsy sections obtained from breast cancer patients. Examination of CD34 immunohistochemically stained sections for the assessment of marrow angiogenesis by quantification of its microvessel density (MVD).

Results: MVD was significantly increased in acute leukemia patients in comparison to control group (P-value <0.001). Increased MVD was associated with unfavorable outcome.

Conclusion: The study demonstrated an evidence of increased angiogenesis in acute leukemia detected by high bone marrow MVD which may play a significant role in leukemic process. Understanding its role may help in designing new therapeutic strategies for acute leukemia.

Keywords: Acute leukemia; Angiogenesis; Microvessel density; Prognosis; Clinical outcome.

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824. Flow Cytometric Assessment of Endothelial and Platelet Microparticles in Preeclampsia and their Relation to Disease Severity and Doppler Parameters

Mahmoud Salem, Sahar Kamal, Walid El Sherbiny and Asmaa A. Abdel Aal

Objective: Platelet (P) and endothelial (E) microparticle (MP) levels increase in preeclampsia. However, their relation to the severity of the disease needs to be clarified. The objectives of this study were to compare the levels of EMP and PMP in severe and mild preeclampsia to healthy gravidas to find possible correlations to severity of the disease, Doppler changes, and complications.

Methods: A comparative prospective clinical trial (Canadian Task Force II-1) was conducted on 135 pregnant women divided into three groups: 35 women with severe preeclampsia (group 1), 40 with mild preeclampsia (group 2), and 60 healthy gravids (group 3). Assessment of EMP and PMP was done by flow cytometry using anti-CD31 and anti-CD42b antibodies.

Results: Expression of CD31 and CD42b (EMPs) was higher in group 1 compared to groups 2 and 3 with P < 0.001, while expression of CD42b alone (PMPs) did not show a statistically significant difference (P = 0.957). EMPs were correlated positively to umbilical and middle cerebral artery resistance index. There was a significant negative correlation between platelet count and EMPs. Also, EMPs were correlated positively to aspartate transferase and bilirubin levels and were significantly higher with neonatal death.

Discussion: The present study revealed a significant association between plasma levels of EMPs and severity of preeclampsia together with poor neonatal outcome as regards birth weight and percent of neonatal death. So, EMPs assay could be a good predictor of maternal and fetal outcomes and in cases with preeclampsia.

Keywords: Preeclampsia; Endothelial microparticles; Umbilical doppler.

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825. Mediterranean Fever Gene Mutations: Correlation with Cytotoxic T-lymphocyte-associated Antigen 4 Gene Polymorphism

Rabab El Hawary, Sherif Elanwary and Safa Meshaal

Mutations in the Mediterranean fever (MEFV) gene lead to familial Mediterranean fever (FMF), a pro-inflammatory state characterized by outbursts of inflammatory cytokines. The aims of this study were to identify the common mutations of MEFV gene in Egyptian patients with FMF, to study cytotoxic T lymphocyte associated antigen 4 (CTLA-4) gene polymorphism and to evaluate correlations between CTLA4–1661 polymorphisms and MEFV mutations and clinical symptoms. Four hundred and twenty-four patients with clinical pictures suspicious of FMF were enrolled in this study. Mutations in MEFV gene were confirmed by reversed hybridization. Patients with homozygous and compound heterozygous mutations and 120 healthy controls were investigated for polymorphism of 1661 CTLA4 gene and the findings correlated with disease incidence and clinical symptoms of the disease. Ninety-seven patients had single heterozygous mutations and 78 had compound heterozygous or homozygous MEFV gene mutations.M694I/V726A was the most common genotype (14.1%), followed by homozygous M694I. There was no statistically significant difference between patients and controls in incidence of 1661 A/G single nucleotide polymorphism CTLA4 (P¼0.189), nor any significant correlation with any of the clinical symptoms of FMF and MEFV gene mutations.

Keywords: Adaptive immune response; CTLA4; Gene polymorphism.

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826. Chondrogenic Differentiation of Human Umbilical Cord Blood-derived Mesenchymal Stem Cells in Vitro

Azza Mostafa Ibrahim, Nesrine Mohamed Elgharabawi, Manal Mohamed Makhlouf and Omnia yahia Ibrahim

Different therapeutic techniques have been developed for regeneration of articular cartilage injuries, but none has provided an optimal solution to their treatment. Human umbilical cord blood-mesenchymal Stem Cells (HUCB-MSCs) have been considered as promising alternative cell source for cartilage repair. Objectives: Examining the success rate of MSCs isolation from HUCB as well as chondrogenic differentiation potential of HUCB-MSCs in vitro.

Materials and Methods: 32 UCB samples were collected, in addition to 5 bone marrow (BM) and 5 peripheral blood (PB) samples, taken as reference controls. Samples were used for mononuclear cells isolation from which MSCs were expanded under complete aseptic conditions, were verified morphologically and through the presence of CD44 and CD105, and absence of CD34.

Results: Success rate of UCB-MSCs isolation was (25%), a rate that was lower than those of PB (40%) and BM (80%). Accordingly, certain input parameters have been recommended for successful MSCs isolation from UCB. On selecting samples in which recommended parameters were fulfilled, success rate was

increased to 72%. This was together with providing optimal experiment conditions; mainly type of expansion medium, success rate reached 80%. Then, successfully expanded MSCs were subjected to chondrogenic differentiation by culturing in pelleted micromass system in presence of transforming growth factor beta-1 and chondrogenic medium devoid of fetal bovine serum to evaluate their ability to undergo chondrogenesis. Differentiation was verified microscopically using special stains, and proved by reverse transcriptase-polymerase chain reaction for expression of aggrecan and collagen II genes. In Conclusion, in vitro differentiation into chondrocytes is possible from HUCB-MSCs.

Keywords: MSCs; HUCB; Chondrogenic differentiation; RT-PCR.

827. Detection of Bacterial Biofilms in Chronic Pharyngitis Resistant to Medical Treatment

Hatem Badran, Mohamad Salah, Mohamed Fawzy, Amal Sayed and Doaa Ghaith

Objective: To evaluate the role played by adenoids as a reservoir for infection in children assigned for adenoidectomy. Methodology: The study included 35 children with adenoid hypertrophy. All patients underwent clinical examination and adenoidectomy, adenotonsillectomy, or myringotomy with insertion of aeration tube according to indications. Surgical specimens were processed for conventional bacterial culture examination and to assay for biofilm formation. The obtained adherence values using spectrophotometer at 595 nm (OD595) was used to classify isolates according to its biofilm forming capacity.
Results: We did adenotonsillectomy and myringotomy with insertion of aeration tube in 5 patients having adenotonsillitis with otitis media with effusion. We did adenotonsillectomy in 12 patients having adenotonsillitis and adenoidectomy in 18 patients having adenoid hypertrophy. Thirty-one surgical specimens showed bacterial growth on conventional media, while 4 specimens failed to give growth. The predominant organism was H influenzae then Staph aureus and Strept pneumoniae. Thirty-two specimens showed biofilm forming capacity (BFC) of variable extent, while others showed no BFC.
Conclusion: Adenoids act as a bacterial reservoir secondary to bacterial biofilm formation so could induce chronicity and initiate development of complications. Determination of BFC using the proposed protocol is feasible, inexpensive, and available and spares the need for sophisticated instruments or approaches.
Keywords: Adenoid; Bacterial growth; Otitis media; Biofilm forming capacity; H Influenzae.

828. Rapid Identification of Nosocomial Acinetobacter Baumannii Isolated from A Surgical Intensive Care Unit in Egypt

Doaa Mohammad Ghaith, Reem Mostafa Hassan and Ahmed Mohamed Hasanin

Background: The rapid and accurate identification of nosocomial clinical isolates is the first essential step in investigating nosocomial outbreaks. We aimed to evaluate the performance of MDR-CHROMagar Acinetobacter versus matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) in rapid detection of nosocomial Acinetobacter baumannii isolated from patients admitted to the surgical intensive care unit (SICU) of Kasr Alainy- Cairo University.
Methods: Over a period of 9 months from January 2014 until September 2014, 234 samples were collected. All samples were directly cultured on MDR-CHROMagar Acinetobacter media. MALDI-TOF MS was used to identify all non-lactose fermenting colonies on conventional media. Confirmation of species identification was done by detecting the blaOXA-51 like gene by PCR.
Results: Statistical evaluation of MDR-CHROMagar Acinetobacter against blaOXA-51 like PCR as the reference method for identification of A baumannii showed a sensitivity of 100% (95% confidence interval [CI]: 93.36% to 100%), specificity 98.8% (95% confidence interval [CI]: 96.04% to 99.68%), positive predictive value 96.4% (95%CI: 86.61% to 99.37%), negative predictive value 100% (95% CI: 97.36% to 100%). The statistical evaluation of MALDI-TOF against blaOXA-51 PCR was 100% concordance.
Conclusion: MALDI-TOF MS was more specific than CHROMagar in identifying Acinetobacter spp and allowed further identification of non-A Baumannii species such as A hemolyticus and A nosocomialis, which are less common Acinetobacter spp involved in hospital-acquired infections.
Keywords: MALDI-TOF; MDR-acinetobacter baumannii; MDR-CHROMagar acinetobacter; BlaOXA-51Like gene.

829. Role of Prolactin as A Cardiovascular Risk in Type 2 Diabetes Mellitus Patients: A Case-Control Study in Egypt

Walaa A. Rabie, Nehal H. El-Said, Ahmed F. Mohammed and Sameh G. Sayed

Prolactin is a recognized platelet co-stimulator due to enhancement of ADP-induced platelet aggregation, and hence participates in the atherosclerotic process. Studies had shown that human adipose tissue produces PRL as well as expresses the PRL receptor (PRLR), which highlights a previously unappreciated action of PRL as a cytokine involved in adipose tissue function. The aim of our study was to asses whether prolactin level is associated with the presence of cardiovascular risk in patients with acute myocardial infarction (AMI) and patients with type 2 diabetes mellitus (DM). This case-control study was conducted on 89 adult males (ages 40–60 years) divided into four groups: 25 diabetics with AMI patients (group 1), 24 non-diabetics with AMI patients (group 2), 20 diabetics but not known to have AMI (group 3), and 20 healthy controls (group 4), in whom serum prolactin was determined using commercially available ELISA kits. Prolactin levels increased along with increased serum troponin; group 1 had the highest level of serum prolactin $(10.6 \pm 6$ ng/ml) in comparison to groups 2 $(8.8 \pm 4$ ng/ml), 3 $(6.9 \pm 2$ ng/ml), and 4 $(5 \pm 2$ ng/ml). According to the cutoff of the receiver operating characteristic (ROC) curve, prolactin is considered better positive than negative marker in cases of AMI.

Hyperprolactinemia may be associated with increased risk of atherosclerotic process and hence occurrence of AMI, as one of the serious macrovascular complications in diabetics. Elevated prolactin levels detected in diabetics having AMI supports the recent trend of using dopamine agonists, e.g., bromocriptine in treatment of type 2 DM especially those who had a prior ischemic event. Also, increased prolactin being associated with increased troponin level in AMI patients may be considered a prognostic factor correlated with the extent of myocardial damage.

Keywords: Prolactin; Acute myocardial infarction; Atherosclerosis; Diabetes.

830. Impact of Circulating Erythrocyte-derived Microparticles on Coagulation Activation in Sickle Cell Disease

Rania A. Zayed, Mona El-Ghamrawi, Hanan A. Alwakeel and Noha Esh

Sickle cell disease (SCD) is characterized by a hypercoagulable state as a result of multiple factors, including chronic hemolysis and the presence of circulating cell-derived microparticles (MPs). The aim of this work was to study the impact of erythrocyte-derived circulating microparticles (glycophorin A; CD235 positive) on coagulation activation and their probable role in contribution to painful crisis in SCD patients. Peripheral blood samples of 25 SCD patients during painful crisis and in steady state were studied for the presence of erythrocyte-derived MPs using flow cytometry. Estimation of D-dimer level, as a marker of coagulation activation, was done using semiquantitative assay. Thirty-six healthy individuals, age- and sex-matched, were included as a control group. Erythrocyte-derived MPs level was significantly higher in SCD patients during painful crisis compared to control group (p=0.02), but no statistically significant difference was found between erythrocyte-derived MPs level in SCD patients in steady state compared to controls or to SCD patients during painful crisis (p=0.3 and 0.49, respectively). D-dimer level was higher in SCD patients both during crisis and in steady state compared to controls (p<0.001). SCD during painful crisis is associated with increased levels of erythrocytederived MPs and D-dimer which may contribute to the hypercoagulable state observed in such group of patients.

Keywords: Coagulation activation; D-dimer; Erythrocyte-derived microparticles; Sickle cell disease.

831. Bone Marrow Examination in Egyptian Patients with Bicytopenia/Pancytopenia

Somaia Mohammed Mousa

The incidences of diseases that cause peripheral blood (PB) cytopenias differ between countries according to the prevalent health problems. This study was carried out in order to identify bone marrow findings and underlying disorders in adult Egyptian patients with PB cytopenias (bicytopenia and pancytopenia).

The study involved patients newly diagnosed as having PB cytopenias over a period of 1 year. Clinical and hematological parameters of patients were recorded. Bone marrow specimens were examined. Sixty-two pancytopenia and 50 bicytopenia patients were included in the study. The most common cause of pancytopenia was clonal hematopoietic disorders (34 %), hypersplenism (27 %), and aplastic anemia (21 %).

The most common cause of bicytopenia was clonal hematopoietic disorders (34 %), ITP (24 %), and hypersplenism (18 %). Lymphoid neoplasms were the most common and account for 57 % of clonal pancytopenia patients and 65 % of clonal bicytopenia patients. Most hypersplenism patients (86 %) had history of hepatitis C viral infection. Our Results show that, in Egypt, clonal hematopoietic disorders, hypersplenism due to chronic liver disease, ITP, and aplastic anemia are the common causes of PB cytopenias. In our setting, causes underlying bicytopenia are as important as those of pancytopenia.

Keywords: Bone marrow examination; Pancytopenia; Bicytopenia; Hypersplenism; Aplastic anemia; HCV; Egypt.

Dept. of Clinical Oncology and Nuclear Medicine

832. TIF1γ Interferes with TGFβ1/SMAD4 Signaling to Promote Poor Outcome in Operable Breast Cancer Patients

Loay Kassem, Mathieu Deygas, Laurent Fattet, Jonathan Lopez, Thibaut Goulvent, Emilie Lavergne, Sylvie Chabaud, Nicolas Carrabin, Nicolas Chopin, Thomas Bachelot, Germain Gillet, Isabelle Treilleux and Ruth Rimokh

Background: The Transforming growth factor β (TGFβ) signaling has a paradoxical role in cancer development and outcome. Besides, the prognostic significance of the TGFβ1, SMAD4 in breast cancer patients is an area of many contradictions. The transcriptional intermediary factor 1γ (TIF1γ) is thought to interact with the TGFβ/SMAD signaling through different mechanisms. Our study aims to define the prognostic significance of TGFβ1, SMAD4 and TIF1γ expression in breast cancer patients and to detect possible interactions among those markers that might affect the outcome.

Methods: Immunohistochemistry was performed on tissue microarray (TMA) blocks prepared from samples of 248 operable breast cancer patients who presented at Centre Léon Bérard (CLB) between 1998 and 2001. The intensity and the percentage of stained tumor cells were integrated into a single score (0–6) and a cutoff was defined for high or low expression for each marker. Correlation was done between TGFβ1, SMAD4 and TIF1γ expression with the clinico-pathologic parameters using Pearson's chi-square test. Kaplan-Meier method was used to estimate distant metastasis free survival (DMFS), disease free survival (DFS) and overall survival (OS) and the difference between the groups was evaluated with log-rank test.

Results: 223 cases were assessable for TIF1γ, 204 for TGFβ1 and 173 for SMAD4. Median age at diagnosis was 55.8 years (range: 27 to 89 years). Tumors were larger than 20 mm in 49.2 % and 45.2 % had axillary lymph node (LN) metastasis (N1a to N3). 19.4 % of the patients had SBR grade I tumors, 46.8 % grade II tumors and 33.9 % grade III tumors. ER was positive in 85.4 %, PR in 75.5 % and Her2-neu was over-expressed in 10 % of the cases.

Nuclear TIF1γ, cytoplasmic TGFβ1, nuclear and cytoplasmic SMAD4 stainings were high in 35.9 %, 30.4 %, 27.7 % and 52.6 % respectively. TIF1γ expression was associated with younger age (p = 0.006), higher SBR grade (p < 0.001), more ER negativity (p = 0.035), and tumors larger than 2 cm (p = 0.081),

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while TGFβ1 was not associated with any of the traditional prognostic factors.

TGFβ1 expression in tumor cells was a marker of poor prognosis regarding DMFS (HR = 2.28; 95 % CI: 1.4 to 3.8; p = 0.002), DFS (HR = 2.00; 95 % CI: 1.25 to 3.5; p = 0.005) and OS (HR = 1.89; 95 % CI: 1.04 to 3.43; p = 0.037). TIF1γ expression carried a tendency towards poorer DMFS (p = 0.091), DFS (p = 0.143) and OS (p = 0.091).

In the multivariate analysis TGFβ1 remained an independent predictor of shorter DMFS, DFS and OS. Moreover, the prognostic significance of TGFβ1 was more obvious in the TIF1γ high patient subgroup than in the patients with TIF1γ low expression. The subgroup expressing both markers had the worst DMFS (HR = 3.2; 95 % CI: 1.7 to 5.9; p < 0.0001), DFS (HR = 3.02; 95 % CI: 1.6 to 5.6; p < 0.0001) and OS (HR = 2.7; 95 % CI: 1.4 to 5.4; p = 0.005).

Conclusion: There is a crosstalk between the TIF1γ and the TGFβ1/SMAD4 signaling that deteriorates the outcome of operable breast cancer patients and when combined together they can serve as an effective prognostic tool for those patients.

Keywords: Breast cancer; TIF1γ; TGF β1.

833. Evaluation of Circulating ADH and MIC-1 as Diagnostic Markers in Egyptian Patients with Pancreatic Cancer

Amal A. Mohamed, Hanan Soliman, Mohamed Ismail, Dina Ziada, Taher M. Farid, Ahmed M. Aref, Moustfa E. Al Daly and Zakaria Y. Abd Elmageed

Background Despite the incidence rate of pancreatic cancer (PC) is uncommon in developing countries, it is considered as one of the most lethal disease. Improving patients' survival requires diagnosis of the disease at early stage.

Therefore, it is imperative to identify more specific and sensitive marker(s) to be used for early detection of PC. Objectives Our aim is to evaluate the potential role of circulating ADH and MIC-1 to be used as diagnostic markers in Egyptian patients and assess their value either alone or combined with CA19-9 in early detection of PC.

Methods Alcohol dehydrogenase (ADH), macrophage inhibitory cytokine (MIC-1) and CA19-9 were measured by ELISA in serum procured from PC patients (n = 50) versus normal subjects (n = 20). Results Our Results demonstrate that the circulating levels of ADH, MIC-1 and CA19-9 in blood of PC were significantly higher than in healthy controls (HCs) (p < 0.001). The highest marker sensitivity observed at early stage was MIC-1 (90%) and specificity was ADH (83%). The level of all three markers was elevated significantly in early stage of PC in comparison to HCs.

The addition of ADH and MIC-1 to CA19-9 significantly improved the efficacy of diagnosis (p = 0.023). Conclusion Our data demonstrate that not only the combination of ADH and MIC-1 to CA19-9 can be used in early detection of PC but also can improve the overall quality of diagnosis of this lethal disease.

Keywords: Pancreatic cancer; Diagnostic markers; ADH; MIC-1, CA19-9; Specificity and sensitivity.

834. Impact of Bilateral Breast Cancer on Prognosis: Synchronous Versus Metachronous Tumors

Noha Y Ibrahim, Mahmoud Y Sroor and Dalia O Darwish

Background: The clinical significance of bilateral breast cancer is unclear and its influence on prognosis is controversial. **Materials and Methods**: Between 2005 and 2009 we identified 110 cases of bilateral breast cancer (BBC) ; 49 patients had synchronous (duration between the occurrence of carcinoma in both breasts was less than 12 months) and 61 had metachronous (duration was more than one year with no ipsilateral local recurrence). We compared the patient characteristics including age, menopausal status, clinical stage, tumor size, histological classification, lymph node status, and hormone receptor and Her-2 status. We also compared the treatment given and overall and disease free survival (DFS) of both groups.

Results: Synchronous cases tend to present more aggressively than metachronous cases and age at first presentation adversely affects survival. The 5 year overall survival was 78.7% for metachronous and 60% for synchronous. Patients with positive hormonal status had better five year disease free survival in metachronous compared to synchronous cases, at 76% and 63%, respectively. Age at first presentation >45years had better DFS (65%) compared to those with age =45 years (52%) at 5 years follow up.

Conclusions: Patients with synchronous breast cancer may have worse prognosis. Young age and hormone receptor negative were risk factors in our study. Close follow up and early detection of contralateral breast cancer is mandatory.

Keywords: Bilateral breast cancer; Synchronous; Metachronous; Survival; Prognosis.

835. Taxane-based Regimens as Adjuvant Treatment for Breast Cancer: A Retrospective Study in Egyptian Cancer Patients

Hamdy Abdel Azim, Yasser Salah el din Abdal-Kader, Mohamed Mahmoud Mousa, Raafat Abdel Malek, Michael Kheir Abdalmassih and Noha Yehia Ibrahim

Background: To evaluate the impact of adding taxanes to anthracycline-based regimens in the adjuvant setting in ocalized young female breast cancer patients on the overall survival (OS) and the disease free survival (DFS).

Materials and Methods: This retrospective study included all female breast cancer patients who were candidates for adjuvant chemotherapy presenting to Kasr Al Ainy centre of clinical oncology and Cairo oncology centre (Cairo Cure) in the period from January 2005 till December 2010.

Results: Our study included 865 patients, 732 of whom received anthracycline based regimens and 133 taxane based regimens. The mean age of patients was 39 years. After a median follow up of 50 months the median DFS was 48.4 months. Survival analysis indicated that the tumor size (>5cm vs. <5cm) p=0.001), nodal involvement (Yes vs. No) p=0.0001) and pathology (invasive lobular vs. ductal) p=0.048) affected DFS. As regards hormonal status, ER, PR and HER 2neu positive patients had longer DFS

(p=0.001, 0.003, 0.106). On multivariate analysis DFS was affected by tumor size and lymph node involvement (p=0.014, 0.007). Subgroup analysis showed improvement in arms treated with taxanes in terms of DFS with positive Her2neu, ER and PR, but this was not statistically significant.

Conclusions: Adding adjuvant taxanes to anthracyclines is beneficial for treatment of localized breast cancer among all subgroups, especially higher risk groups .The type of adjuvant chemotherapy regimens and tumor characteristics have direct effects on DFS.

Keywords: Breast cancer; Egypt; Adjuvant chemotherapy; Taxanes; Her2neu; Hormonal status.

836. Efficacy and Toxicity of Sunitinib in Metastatic Renal Cell Carcinoma Patients in Egypt

Wael Abdelgawad Edesa and Raafat Ragaey Abdelmalek

Background: To evaluate our Results in terms of response, survival and toxicity profile of sunitinib among Egyptian patients with metastatic renal cell carcinoma.

Materials and Methods: Between January 2010 and December 2013, 44 patients with metastatic renal cell carcinoma who received sunitinib at an oncology center of Cairo university hospitals were enrolled in this retrospective analysis.

Results: The median age of the patients was 53 years, 22 (50%) having localized disease at presentation ,while the remaining half of the patients presented with metastasis. At a median follow up of 19 months, 9 (21%) patients achieved partial remission, while disease was reported stable in 20 cases (45%) and progressive in 7 (16%), 4 (9%) being lost to follow up, and 4 (9%) had discontinued therapy due to toxicity. The median overall survival was 23 months (95%CI 15.2 - 30.9), while progression free survival was 12 months (95%CI 11.6 - 12.3). The most commonly reported non hematological grade 3 adverse events included mucositis (15.9%), hand-foot syndrome (13.6%), and fatigue (9%), while the predominant grade 3 or 4 laboratory abnormalities were neutropenia (6.8%), followed by anemia in 4.5% of patients.

Conclusions: Our efficacy data were comparable to the published literature in terms of progression free survival and overall survival , while toxicity profile is different from Asian and western countries. However, sunitinib adverse events were manageable and tolerable in most of our Egyptian patients

Keywords: Renal cell carcinoma; Sunitinib; Toxicity; Efficacy; Egyptian cases.

837. The Added Value of PET/Ce-CT/DW-MRI Fusion in Assessment of Hepatic Focal Lesions: Pet/Ce-Ct/Dw-Mri Fusion in Hepatic Focal Lesion

Shahenda Salem, Mohamed Al-Houseni, Lamia Zidan and Ahmed Kandil

Introduction: The liver hosts a variety of benign and malignant tumors. Accurate diagnosis can be challenging in certain cases, especially in patients with a history of malignancy or in those with underlying liver pathology, such as cirrhosis.

Objectives: To evaluate the added clinical value of multi-modality liver imaging utilizing PET/Ce-CT/DW-MRI for characterization of hepatic focal lesions (HFL) and compare it with each diagnostic modality when interpreted alone.

Methods: The study included 35 patients with HFL. They were 7 females & 28 males; their age ranged from 41 to 78years, all patients underwent PET/Ce-CT and DW-MRI scans. Ce-CT, PET and DW-MR images were reviewed independently, and then combined PET/Ce-CT, PET/DW-MRI and PET/Ce-CT/DW-MRI scans were analyzed. The Results were correlated with histopathology or clinical/imaging follow-up.

Results: The 35 patients had 98 focal lesions. Fifty-three lesions were finally diagnosed as primary hepatocellular carcinoma, 18 lesions were metastases, 7 lesions were lymphoma and 20 lesions were benign. On a patient based analysis; the sensitivity, specificity, PPV, NPV and accuracy were 100%, 67%, 94%, 100% and 94% for PET/Ce-CT compared to 97%, 83%, 97%, 83% and 94 % for DW-MRI, respectively. Combined PET/Ce-CT/DW-MR scans raise those parameters up to 100%. On a lesion based analysis; the sensitivity, specificity, PPV, NPV and accuracy were 94%, 75%, 94%, 75%, 90% for PET/Ce-CT compared to 94%, 95%, 99%, 97% and 94 % for DW-MRI, respectively. All these parameters were 100 % with PET/Ce-CT/DW-MRI.

Conclusions: The addition of DW-MRI to PET/Ce-CT is valuable in the characterization of hepatic focal lesions.

Keywords: Hepatic focal lesions; Magnetic resonance imaging; Positron emission computed tomography/computed tomography; Magnetic resonance imaging.

838. Gestational Trophoblastic Neoplasia: Treatment Outcomes from A Single Institutional Experience

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Purpose To report the outcomes of gestational trophoblastic neoplasia (GTN) at a single institution and to determine the factors affecting response to chemotherapy and survival. Methods/Patients From 1979–2010, we retrospectively reviewed the data of 221 patients treated at our center. GTN Patients were assigned to low-risk (score B6) or high-risk (score C7) based on the WHO risk factor scoring system. Overall survival (OS) probabilities were estimated using Kaplan–Meier method. Logistic regression was applied to study the impact of different factors on the response to initial therapy. Results Patients' OS rate was 97 %. Median age at diagnosis was 37 year. 131 (59 %) patients had low-risk and 88 (40 %) cases had high-risk GTN. Complete remission rates to initial chemotherapy in low-risk group were 53 % and 87 % for single-agent methotrexate or dactinomycin, respectively. In high-risk group, 94 % achieved complete remission to initial chemotherapy with etoposide, methotrexate, dactinomycin, cyclophosphamide, and vincristine (EMA-CO). Etoposide, cisplatin, and dactinomycin as primary therapy in high-risk patients was successful in 70 %, while bleomycin, etoposide, and cisplatin (BEP) was successful in 53 % of cases. Salvage chemotherapy, surgical intervention or radiation therapy resulted in overall complete remission of 90 % in low-risk and 73 % in high-risk groups. Factors associated with resistance

to initial chemotherapy were advanced-stage III/ IV (p = 0.005), metastatic site other than lung or vagina (p = 0.005) and high-risk prognostic score (p = 0.05). OS was significantly influenced by the type of antecedent pregnancy (molar 98 % vs. others 93 %; p = 0.04), FIGO stage (I, II 100 % vs. III, IV 94 %; p = 0.02), score (lowrisk 100 % vs. high-risk 92 %; p = 0.01), and site of metastasis (lung/vagina 98 % vs. others 85 %; p = 0.002). Conclusions GTNs have excellent prognosis if properly treated at experienced centers. Single-agent dactinomycin seems more effective for low-risk GTN. EMA-CO remains the preferred primary treatment regimen for high-risk group. The excellent outcome reflects the success of salvage therapy.

Keywords: Gestational trophoblastic disease; Chemotherapy, treatment; Survival; Clinical outcomes; Salvage therapy.

839. Comparative Assessment of Gastric Emptying in Obese Patients Before and after Laparoscopic Sleeve Gastrectomy Using Radionuclide Scintigraphy

Ahmed A. Kandeel, Mohamed D. Sarhan, Tarek Hegazy, Moustafa M. Mahmoud and Mohamed H. Ali

Radionuclide scintigraphy provides a standard physiologic evaluation of gastric emptying (GE) after laparoscopic sleeve gastrectomy (LSG). This operation can be associated with motor gastric dysfunction and abnormal GE. The aim of this study was to evaluate the short-term effect of LSG on GE quantitative indices for liquids and solids compared with preoperative results. Forty obese patients were divided into two equal groups, the liquid and solid groups. ^{99m}Tc–sulfur colloid GE scintigraphy was performed on all patients submitted to LSG before and after surgery (1–4 weeks for liquids and 4–6 weeks for solids). The quantitative indices included half emptying time ($T_{1/2}$) and percentage gastric retention at 15, 30, and 60 min for liquids and at 30, 60, 90, and 120 min for solids. A modified technique was used to label a boiled egg in order to be tolerated by the patients. $T_{1/2}$ was significantly enhanced after LSG compared with baseline (25.3 ± 4.4 vs. 11.8 ± 3.0 min for liquids and 74.9 ± 7.1 vs. 28.4 ± 8.3 min for solids, respectively, $P<0.001$). The percentage of gastric retention in operated patients was significantly less than that at baseline for liquids at 15, 30, and 60 min (33.9 ± 5.6, 17.7 ± 3.9, and $7.5\pm2.8\%$ vs. 69.4 ± 10.5, 55.6 ± 14.95, and $26.1\pm4.7\%$, respectively, $P<0.001$), as well as for solids at 30, 60, 90, and 120 min (42.0 ± 11.1, 20.8 ± 6.1, 11.0 ± 5.9, and $3.8\pm2.7\%$ vs. 79.9 ± 8.7, 67.4 ± 12.2, $37.0\pm10.9\%$, and $13.8\pm4.4\%$, respectively, $P<0.001$). The significant acceleration of GE of liquids and solids after LSG may have contributed to weight loss in the immediate postoperative period (4–6 weeks). It remains to be determined whether the weight loss will continue beyond that period.

Keywords: Gastric emptying; Laparoscopic sleeve gastrectomy; Obesity; Radionuclide scintigraphy.

840. Comparison Between Low and High Radioactive Iodine (^{131}I) Reablation Dose in Patients with Papillary Thyroid Cancer

Sherif M. El-Refaei, Shereen W. Yassin, Khaled Salman, Tarek Al Munshy, Manal Al-Ezzi, Yasser M. Al-Sayed and Maha Abd Elkareem Husseni

Aim: The aim of this study was to assess ablation outcome after a second ablation dose and compare the ablation rate after low and high reablation doses of iodine-131 (^{131}I) after failure of the first ablation with 3700MBq.

Patients and Methods: The study included 81 patients with papillary thyroid cancer; they failed to achieve complete ablation after a first ablative dose of 3700MBq. Their first follow-up ^{131}I whole-body scan carried out 6–9 months after ablation showed small residual functioning tissue in the thyroid bed, with no functioning metastases. This is associated with unsuppressed serum thyroglobulin level (Tg) higher than 2 ng/ml. The patients received a second ablation dose, which was low (1110MBq) in 37 patients and high in the remaining 44 patients (2960MBq in 36 patients and 3700MBq in eight patients). A whole-body scan and Tg level assessment were carried out 6–9 months later. The criteria for complete ablation included absence of residual functioning thyroid tissue and a Tg level lower than 2 ng/ml.

Results: The overall successful complete ablation rate after the second reablation dose was 75%. This was achieved in 27 of 37 patients (73%) who received a low reablation dose and in 34 of 44 patients (77%) who received a highreablation dose; no statistically significant difference was found between the two groups (P>0.05).

Conclusion: In patients with papillary thyroid cancer who failed to achieve complete ablation after the first ablation dose of 3700MBq, the overall complete ablation rate after both a low and a high second ^{131}I dose was 75%, with no statistically significant difference in ablation rate between low (1110MBq) and high (2960 and 3700MBq) doses.

Keywords: Complete successful ablation; Papillary thyroid cancer; Radioactive iodine remnant ablation; Second reablative radioiodine dose.

841. Bone Scintigraphy in Axial Seronegative Spondyloarthritis Patients: Role in Detection of Subclinical Peripheral Arthritis and Disease Activity

Tamer A. Gheita, Ghada S. Azkalany, Sanaa A. Kenawy and Ahmed A. Kandeel

Aim: To detect subclinical peripheral arthritis and disease activity in axial seronegative spondyloarthritis (SpA) patients using bone scintigraphy.

Methods: Seronegative SpA patients with an established diagnosis and no clinically evident arthritis at the time of the study were included. After excluding symptomatic cases, 20 patients were recruited; 18 with ankylosing spondylitis (AS) and another two with psoriatic arthritis (PsA). Conventional bone scintigraphy was performed to detect the distribution of increased uptake, blood vascular pool (vascularity) and activity.

Results: The peripheral joints in all the patients were asymptomatic with no signs of arthritis on clinical examination. Disease activity was higher in those with hypervascularity and activity (75%) detected by scintigraphy. Scintigraphic activity of the sacroiliac joints was found in 10 patients (50%) with a mean sacroiliac joint index of 2.4 ± 0.6. Subclinical involvement of the hips, knees, shoulders, ankles, small joints of the hands, ankles and sternoclavicular joints, as well as the small joints of the feet were detected with descending frequencies (25%, 25%, 20%, 20%, 15%, 10% and 10%, respectively). Dorsal spine increased uptake was found in 35% and hypervascularity of the skull in two cases. Avascular necrosis of the hip was present in one case with hypovascularity.

Conclusion: The spectrum of joint involvement in seronegative SpAs should not be limited to sacroiliitis. Bone scintigraphy provides a cost-effective method for detecting the extent of involvement in this group of autoimmune systemic diseases (axial SpA) without clinical evidence of peripheral arthritis.

Keywords: Ankylosing spondylitis; Bone scintigraphy; Psoriatic arthritis; Seronegative spondyloarthritis.

842. The Relation Between the Timing of Palliative Care and the Frequency and Timing of Do-Not-Resuscitate Orders Among Cancer Deaths in A Tertiary Care Hospital

Samy A. Alsirafy, Amrallah A. Mohammed, Abdullah S. Al-Zahrani, Ahmad A. Raheem and Amr T. El-Kashif

The medical records of 246 in-hospital cancer deaths were reviewed to explore the relation between palliative care (PC) timing and the frequency and timing of do-not-resuscitate (DNR) designation. The rate of DNR designation was 100% in patients referred to PC and 82% in those never referred (P < .001). Patients were grouped into 4 groups: early PC (>90 days from PC referral to death), intermediate PC (>30-90 days), late PC (=30 days), and no PC. The median DNR to death time was 96, 41, 11, and 3 days, respectively (P < .001). The proportion of intensive care unit (ICU) deaths was 0%, 1%, 3%, and 27%, respectively (P < .001). In Conclusion, in a tertiary care hospital, earlier PC was associated with earlier DNR designation and less frequent ICU deaths among in-hospital cancer deaths.

Keywords: Timing of palliative care; Cancer deaths; Do-not-resuscitate orders; Intensive care unit; End-of-life care; Aggressiveness.

843. Palliative Care Consultation Versus Palliative Care Unit: Which Is Associated with Shorter Terminal Hospitalization Length of Stay Among Patients with Cancer?

Samy A. Alsirafy Ahmad M. Abou-Alia and Hafez M. Ghanem

Hospital length of stay (LoS) may be used to assess end-of-life care aggressiveness and health care delivery efficiency. We describe the terminal hospitalization LoS of patients with cancer managed by a hospital-based palliative care (PC) program comprising a palliative care consultation (PCC) service and an inpatient palliative care unit (PCU). A total of 328 in-hospital cancer deaths were divided into 2 groups. The PCU group included patients admitted by the PC team directly to the PCU. The PCC group included patients admitted by other specialties and referred to the PCC team. The LoS of the PCU group was significantly shorter than that of the PCC group (9.9 [±9.4] vs 17.8 [±19.7] days, respectively; P < .001). Direct terminal hospitalization to PCU is not associated with longer LoS among cancer deaths managed by a hospital-based PC service.

Keywords: Palliative care unit; Palliative care consultation; Length of stay; End-of-life care; Advanced cancer; Tertiary care hospital.

844. Advanced Luminal Breast Cancer (Hormone Receptor-positive, HER2 Negative): New Therapeutic Options in 2015

Vanacker H, Bally O, Kassem L, Tredan O, Heudel P and Bachelot T

Despite improvements in early detection, surgery and systemic therapy, metastatic breast cancer remains a major cause of death. Luminal type breast cancers expressing hormone estrogen receptor (ER) or progesterone (PR) and without HER2 overexpression are generally sensitive to endocrine therapy, but raise the issue of the occurrence of resistance to treatment, particularly at metastatic stage. A better understanding of hormone resistance may guide the development of new therapeutics. New strategies aim at enhancing and prolonging of endocrine sensitivity, by optimizing existing schemes, or by combining an endocrine therapy with a targeted therapies specific to hormone resistance pathways: ER signaling, PI3K/AKT/mTOR and Cyclin Dependent Kinase (CDK). Key corners of 2014 include confirmation of benefit of high dose fulvestrant, and commercialization of everolimus as the first mTOR inhibitor in this indication. Other strategies are being tested dealing with new endocrine therapies or new molecular targets such as PI3K inhibitors, insulin-like growth factor receptor (IGF-R) and histone deacetylase (HDAC) inhibitors. Coming years may be fruitful and might radically change our way to treat these patients.

Keywords: Cancer du sein; Hormone; Hormone therapy; Hormonothérapie; Targeted therapy; Thérapies moléculaires; advanced breast cancer; ciblées; hormonosensible; receptor-positive.

845. Using Neuroleptics to Treat Delirium in Dying Cancer Patients at A Cancer Center in Saudi Arabia

Mohammad Zafir Al-Shahri, Mahmoud Yassin Sroor, Wael Ali Ghareeb, Enas Noshy Aboulela and Wael Edesa

Neuroleptics are commonly used for treating delirium as a common problem in terminally ill cancer patients. However, prescribing patterns are believed to substantially vary among health professionals. The aim of this study is to determine the pattern of prescribing neuroleptics for treating delirium in cancer patients dying in a palliative care unit in Saudi Arabia. We

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reviewed the medical records of adults with advanced cancer who died in the palliative care unit over 23 months. In addition to patients' demographics, data collection included the pattern of prescribing neuroleptics for the treatment of delirium during the last week of life. For the 271 patients included (57.6% females), the median age was 54 years. Although 62% of patients were on around-the-clock (ATC) neuroleptics to treat delirium, about two thirds of these were requiring rescue doses (PRN [pro re nata]) as well. The ATC neuroleptics included haloperidol alone (89.3%), levomepromazine alone (2.4%), or both (8.3%). All neuroleptics were administered via the parenteral route. On average, the maximum daily doses of the ATC neuroleptics were 4 mg for haloperidol and 15.5 mg for levomepromazine. Patients with primary or metastatic brain cancers were less likely to be on neuroleptics (P < .0001). The authors conclude that in their palliative care unit, haloperidol is by far the most commonly used neuroleptic, followed by levomepromazine, to treat the common problem of delirium in patients dying with advanced cancer. The generally low doses of neuroleptics required may be attributed to several factors in this population, including cultural motives.

Keywords: Cancer; Delirium; End of life, Palliative care.

846. The Fear of Using Tramadol for Pain Control (Tramadolophobia) Among Egyptian Patients with Cancer

Samy A. Alsirafy, Radfan N. Saleh, Radwa Fawzy, Ahmed A. Alnagar, Ahmed M. Hammad, Wessam El-Sherief, Dina E. Farag, and Riham H. Radwan

Objectives: The fear of using tramadol for pain control (tramadolophobia) by Egyptian patients with cancer is a frequent problem in our practice. This study was conducted to explore the prevalence of and the reasons behind tramadolophobia among Egyptian patients with cancer.

Methods: A structured interview including open-ended and closed questions. The study included 178 adult patients with cancer from two cancer centers in Cairo and Sharkia, Egypt.

Results: The source of information about tramadol was a non-healthcare-related source in 168 (94 percent) patients, mainly the media (50 percent). The believed uses of tramadol were abuse related in 94 (53 percent) patients, stimulant (physical, sexual, and to boost alertness) in 59 (33 percent), and analgesic in 55 (31 percent). Twenty-six (15 percent) patients gave history of tramadol use, largely (69 percent) as a stimulant. In case tramadol was prescribed for pain control, 90 (51 percent) patients refused to take it, 59 (33 percent) patients agreed to take it with concern about addiction, and only 29 (16 percent) patients agreed without concerns. Among those who refused taking tramadol for pain, the mentioned reason of refusal was addiction-related fears in 57 percent.

Conclusions: The stigmatization and misconceptions about tramadol may have resulted in tramadolophobia among the majority of Egyptian patients with cancer. This further complicates the barriers to cancer pain control in Egypt. Being the only available World Health Organization step-II analgesic in Egypt, interventions to overcome tramadolophobia should be taken.

Keywords: Cancer; Pain; Tramadol; Abuse; Phobia; Egypt.

847. The Place of Death of Patients with Cancer in Kuwait

Salem H Alshemmari, Amani A Elbasmi and Samy A Alsirafy

Background The place of death (PoD) has a significant effect on end-of-life care for patients dying of cancer. Little is known about the place of cancer deaths in our region.

Methods: To identify the PoD of patients with cancer in Kuwait, we reviewed the death certificates submitted to the Kuwait Cancer Registry in 2009.

Results Of 611 cancer deaths, 603 (98.7%) died in hospitals and only 6 (1%) patients died at home. More than half (57.3%) of inhospital deaths were in the Kuwait Cancer Control Center. Among those for whom the exact PoD within the hospital was identified (484 patients), 116 (24%) patients died in intensive care units and 12 (2.5%) patients died in emergency rooms.

Conclusions This almost exclusive inhospital death of patients with cancer in Kuwait is the highest ever reported. Research is needed to identify the reasons behind this pattern of PoD and to explore interventions promoting out-of-hospital death among terminally ill cancer patients in Kuwait.

Keywords: Place of death; Palliative care; Cancer; Kuwait.

848. Influence of Low Grade Exercise on Skeletal Scintigraphy Using TC-99M Methylene Diphosphonate

Amr Amin, Maha Abd El-Kareem and Abu Baker Yahia

Background: Tc-99m methylene diphosphonate [MDP] bone scan is the basis of the skeletal imaging in nuclear medicine being a highly sensitive tool for detecting bone diseases. Mechanical stimulation induced by low grade exercise or whole-body vibration appears to be advantageous regarding the maintenance and/or improvement of skeletal mass in humans. We aimed to assess the physiological influence of low grade exercise on the quality of skeletal scintigraphy using Tc-99m MDP.

Material and Methods: Tc-99m MDP bone scan was done for 92 volunteers [Group 1; G1]. Five days later, the same subjects were re-scanned [Group 2; G2] after an exercise on treadmill for 5 minutes. Image quality was assessed using quantitative measures whereby equal regions of interest (ROI) were drawn over the femoral diaphysis, and the contralateral adductor area. The total number of counts from the bone [B] ROI and soft tissue [ST] ROI was expressed as a ratio [B:ST ratio] and a mean value for each was established.

Results: Statistically significant difference was found between the B:ST ratio means [p = 0.001] in G1 and G2.

Conclusion: This study raised a physiological influence of low grade exercise on the image quality of tc-99m MDP skeletal scintigraphy by increasing MDP osseous uptake.

Keywords: Bone scan; Tc-99M MDP; Physiological effect of exercise; Osseous uptake.

849. Impact of Imatinib Interruption and Duration of Prior Hydroxyurea on the Treatment Outcome in Patients with Chronic Myeloid Leukemia: Singleinstitution Experience

Wael Abdelgawad Edesa and Raafat Ragaey Abdel-malek

Background: Optimal response requires that patients should be maintained on the drug continuously. Objectives: To evaluate the influence of imatinib interruption and prior hydroxyurea use on the outcome of patients with chronic myeloid leukemia.
Materials and Methods: Between January 2010 and November 2013, patients with chronic phase who received imatinib at the Kasr Al-ainy Center of Clinical Oncology were included. **Results**: Sixty patients were included in this study, thirty three patients (55%) received imatinib upfront, while 27 (45%) received imatinib post hydroxyurea. Imatinib was not given regularly in 50% of patients. In terms of response, only major molecular response and complete molecular response were statistically significant in favor of patients who were receiving imatinib regularly compared to those who had interruption (p< 0.001, p<0.001, respectively) , while there was no difference in patients stratified according to prior hydroxyurea. The median progression free survival was 30.3 months (95% CI 24.3–36.3). Among the group of patients who received imatinib regularly, progression free survival was longer (p=0.049), there was no difference between those who received prior hydroxyurea versus those who did not (p= 0.67).
Conclusion: Duration of prior hydroxyurea had no impact on response or progression free survival, while patients regular on imatinib had statistically significant difference with respect to majormolecular response, complete molecular response and progression free survival compared to those who had periods of drug interruption, thus we need more governmental support to supply the drug without interruption to improve the outcome of therapy.
Keywords: Chronic myeloid leukemia; Imatinib; Hydroxyurea; Treatment interruption.

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850. Susceptibility and Progression of End Stage Renal Disease Are Not Associated with Angiotensin Ii Type 1 Receptor Gene Polymorphism

Mariam Onsy F. Hanna, Rasha Mohamad Hosny Shahin, Safa S. Meshaal and Inas F. Kostandi

Context: The role of the angiotensin II type 1 receptor (AT1R) gene polymorphism, A1166C, has been shown to be associated with end stage renal disease (ESRD) and its progression. There is also some evidence that HLA class II alleles are associated with ESRD independent of other factors. Objective To examine the association between AT1R gene polymorphism in the susceptibility and progression to ESRD in patients with chronic renal failure and to investigate if the AT1R genotypes and HLA-DR alleles predict the time to ESRD.

Materials and Methods: Genotyping was performed in 50 ESRD patients and 44 control subjects for the AT1R A1166C gene polymorphism using polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP). ESRD patients were examined for HLA-DRB1 alleles according to a reverse hybridization line probe assay.
Results: Allele and genotype frequencies of the AT1R polymorphism did not differ significantly between ESRD patients and controls. Furthermore, there was no association between the AT1R gene polymorphism or HLA-DRB1 alleles with the time to the occurrence of end stage failure.
Discussion and Conclusion: We concluded that the AT1R genotype does not contribute to the genetic susceptibility of ESRD and is not associated with progression of chronic kidney failure to ESRD.
Keywords: Angiotensin II type 1 receptor; DNA polymorphism; End stage renal disease.

851. Peripheral Expression of Hepcidin Gene in Egyptian β-Thalassemia Major

Azza Aboul-Enein, Amal EL-Beshlawy, MonaHamdy, Iman Shaheen, Zainab El-Saadany, Ahmed Samir and Hala Abd El-Samie

Iron overload is the major cause of morbidity and mortality in transfusion dependent β-thalassemia major patients. There is a sophisticated balance of body iron metabolism of storage and transport which is regulated by several factors including the peptide hepcidin. Hepcidin is the main iron regulatory molecule; it is secreted mainly by the liver and other tissues including monocytes and lymphocytes. Expression of hepcidin in such cells is unclear and has been studied in few reports with controverted result. Peripheral expression of hepcidin was measured using quantitative real time PCR (qRT-PCR) in 50 α-thalassemia major patients, in addition to 20 healthy volunteers as a control group.Hepcidin levels in β-thalassemia major patients showed statistically significant decrease in comparison to the control group, and was correlated to cardiac iron stores (T2*). However, hepcidin level was not different among the patients according to the HCV status or whether splenectomized or not. In Conclusion; peripheral expression of hepcidin, in iron overloaded β-thalassemia major patients, is a reflection of hepatic expression. It can be used as a molecular predictor for the severity of cardiac iron overload and can be used as a future target for therapy in α-thalassemia major patients
Keywords: β-Thalassemia; Hepcidin expression; qRT; PCR; Cardiac iron (T2*)

852. A Study of VEGF Gene Polymorphism in Egyptian Patients with Diabetic Retinopathy

Rasha Mohamad Hosny Shahin, Mohamad Amr Salah Eddin Abdelhakim, Mohammed El Sayed Mahmoud Owid and Mohamed El-Nady

Background: There are subgroups of patients with diabetes mellitus (DM) in whom diabetic retinopathy (DR) does not develop despite poor long-term control of their disease, while

others exercising fairly good control, develop retinopathy. So, we aimed to investigate the association of DR with 2578 polymorphism of the vascular endothelial growth factor (VEGF) gene, which has been reported to be associated with increased VEGF production, in Egyptian diabetic patients.

Materials and Methods: This is a case control study in which 148 diabetic patients were enrolled. Among them, 44 subjects had proliferative diabetic retinopathy (PDR), 30 had non-proliferative diabetic retinopathy (NPDR), and 74 individuals without retinopathy served as controls. A single nucleotide polymorphism (SNP) of the VEGF gene, a C!A transversion at 2578 (the C/A polymorphism), was investigated by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP).

Results: We found a higher frequency of the polymorphic genotype in both the NPDR (66.7%) and PDR (72.7%) groups compared to the wild C/C genotype (33.3% in NPDR and 27.3% in PDR), but with no statistically significant difference from the control group. Significant association of the progression of DR to the polymorphic genotype was achieved at diabetes duration more than 20 years.

Conclusion: Despite of the higher frequency of both the polymorphic genotype and the A allele in cases with DR compared to the control group, there might be no significant association between the VEGF gene polymorphism and DR per se, unless it is longstanding.

Keywords: Diabetic retinopathy; Egypt; VEGF C-2578A.

853. Immunomodulatory Effects of Umbilical Cord-Derived Mesenchymal Stem Cells

Shereen Shawki, Taghrid Gaafar, Hadeel Erfan, Engy El Khateeb, Ahmad El Sheikhah and Rabab El Hawary

Umbilical cord blood (UCB) is of great interest as a source of stem cells for use in cellular therapies. The immunomodulatory effect of mesenchymal stem cells (MSCs) originating from bone marrow, adipose tissue and amniotic membrane have previously been reported. In this study, MSCs were isolated from UCB with the aim of evaluating their immunomodulatory effects on proliferation of PB lymphocytes by two different techniques; namely, 5-bromo-2-deoxyuridine ELISA and a carboxy fluorescein diacetate succinimidyl ester flow cytometric technique. MSCs were isolated from UCB, propagated until Passage four, and then characterized for cell surface markers by flow cytometry and ability to differentiate towards osteocytes and adipocytes. Immunosuppressive effects on PB lymphocytes were examined by co-culturing mitomycin C-treated UCB MSCs with mitogenstimulated lymphocytes for 72 hr. Thereafter, proliferation of lymphocytes was detected by CFSE flow cytometry and colorimetric ELISA. The titers of cytokines in cell culture supernatant were also assayed to clarify possible mechanisms of immunomodulation. UCB MSCs suppressed mitogenstimulated lymphocyte proliferation, which occurs via both cell-cell contact and cytokine secretion. Titers of transforming growth factor beta and IL 10 increased, whereas that of IFN-g decreased in the supernatants of co-cultures. Thus, UCB MSCs suppress the proliferation of mitogen-stimulated lymphocytes. However further in vivo studies are required to fully evaluate the immunomodulatory effects of UCB MSCs.

Keywords: Cord blood; Immunomodulation; Mesenchymal stem cells; Proliferation.

854. Contribution of HLA-DR to Polycystic Kidney Disease in A Sample of Egyptian Patients

Rasha Mohamad Hosny Shahin and Ahmed Mahmoud Ahmed Shouman

The aim of this study was to investigate whether certain DR alleles might contribute to the genetic susceptibility among adult polycystic kidney disease patients in Egypt. This case–control study involved human leukocyte antigen (HLA)-DR typing for 40 non-related Egyptian patients with autosomal dominant polycystic kidney disease. Patients were compared with a group of 50 healthy subjects. Human leukocyte antigen DRB1 typing was carried out on allele level (DRB1*01 — DRB1*16) using polymerase chain reaction-sequencespecific oligonucleotide probes (PCR-SSOP). No statistically significant association of the disease with HLADRB1 was observed. So, HLA-DRB1 does not contribute to polycystic kidney disease in Egyptian patients.

Keywords: Polycystic kidney disease; Human leukocyte antigen; Egypt.

Dept. of Dermatology

855. Developing Core Outcome Set for Vitiligo Clinical Trials: International E-delphi Consensus

Viktoria Eleftheriadou, Kim Thomas, Nanja van Geel, Iltefat Hamzavi, Henry Lim, Tamio Suzuki, Ichiro Katayama, Tag Anbar, Marwa Abdallah, La€ıla Benzekri, Yvon Gauthier, John Harris, Caio Cesar Silva de Castro, Amit Pandya, Boon Kee Goh, Cheng-Che E. Lan, Naoki Oiso, Ahmed Al Issa, Samia Esmat, Caroline Le Poole, Ai-Young Lee, Davinder Parsad, Alain Taieb, Mauro Picardo and Khaled Ezzedine

Vitiligo is the most common depigmentating disorder affecting about 0.5% of the population worldwide (Whitton et al., 2010). Currently, there is a lack of consensus on the definition and Methods of assessment of vitiligo, which makes it difficult to perform meta-analyses or to compare the outcomes of different studies (Gonzalez et al., 2011; Whitton et al., 2010). It has been increasingly recognized that 'core outcomes' should be agreed upon and reported in all trials to allow the Results of trials to be compared and combined in meta-analyses (COMET Initiative: Core Outcome Measures Initiative www.comet-initiative.org). A recently conducted systematic review of outcome measures used in randomized controlled trials (RCTs) of patients with vitiligo as well as a survey of the most desirable outcomes for patients and clinicians concluded that there is no unified scale to measure repigmentation and that patient input in outcomes assessment is limited. Twenty-five outcomes were measured in 54 RCTs (Eleftheriadou et al., 2012). Moreover, another systematic review on outcome measures in vitiligo showed that none of the scales used was validated and met the COSMIN criteria (Vrijman et al., 2012). These two systematic reviews identified a huge problem in vitiligo research and an urgent need for developing a core outcome set at the first place. Vitiligo is a cosmetically and psychologically devastating disease (Lerner and Nordlund, 1978). Therefore, one would expect that subjective perception of the disease (i.e. patients' views on the effectiveness of a treatment) would be considered important. However, patient-centred

outcomes have rarely been included in vitiligo trials, despite previous recommendations for their inclusion in studies of patients with vitiligo (Eleftheriadou et al., 2012; Gonzalez et al., 2011; Whitton et al., 2010). It is crucial to achieve a better standardization in the outcomes applied in clinical research, and therefore, it is necessary to reach consensus among researchers to ensure that the outcomes used in trials for vitiligo treatments are reliable, clinically relevant and important to both clinicians and patients (Gonzalez et al., 2011; Whitton et al., 2010). This study aimed to develop international consensus over a core outcome set for vitiligo trials that is acceptable to healthcare professionals, patients and their caregivers, researchers and regulatory bodies. This consensus project was conducted as part of an international collaboration coordinated through the International Federation of Pigment Cell Societies (IFPCS) and the Centre of Evidence Based Dermatology at the University of Nottingham.

Keywords: Vitiligo; Vitiligo clinical trials; Vitiligo consensus.

856. Association of Angiotensin-Converting Enzyme (ACE) Gene Polymorphism with Inflammation and Cellular Cytotoxicity in Vitiligo Patients

Laila Rashed, Rania Abdel Hay, Rania Mahmoud, Nermeen Hasan, Amr Zahra and Salwa Fayez

Background: Vitiligo is a disorder with profound heterogeneity in its aetio-pathophysiology. Angiotensin converting enzyme (ACE) plays an important role in the physiology of the vasculature, blood pressure and inflammation. An insertion/deletion (I/D) polymorphism of the ACE gene was reported be associated with the development of vitiligo.
Objective: Our aim was to evaluate the ACE I/D polymorphism in vitiligo patients and controls. Our second aim was to find a possible association between ACE gene polymorphism and inflammatory mediators (as interleukin (IL)-6) and/or cellular cytotoxicity induced by serum nitrite (as a breakdown product of the cytotoxic nitric oxide) in vitiligo patients.
Methods: This case-control study included 74 vitiligo patients and 75 apparently healthy controls. The distribution of ACE gene I/D genotype was investigated using PCR. Serum ACE, IL-6 and nitrite were measured by colorimetric method, ELISA and Griess assay respectively.
Results: The ACE allele frequency was significantly different between vitiligo patients and healthy controls (P = 0.026). However there was no significant difference between the ACE genotyping frequency in both groups (P = 0.115). There were statistically significant higher VIDA score (P = 0.007), and serum IL-6 (P < 0.001) in patients with the DD genotype when compared to other genotypes. Serum nitrite in patients with the DD genotype was significantly higher (P = 0.007) when compared to patients with II genotype. Serum levels of ACE, IL-6 and nitrite in vitiligo patients were statistically significantly higher than those in controls.
Conclusion: As a Conclusion, ACE gene polymorphism might grant susceptibility to develop vitiligo. Serum IL-6 and nitrite levels might have an important role in the pathogenesis of vitiligo. Targeting these two factors might have an implication in the treatment of some resistant cases.
Keywords: Angiotensin converting enzyme; Gene polymorphism; Vitiligo.

857. Vitamin D and the Skin: Focus on A Complex Relationship: A Review

Wedad Z. Mostafa and Rehab A. Hegazy

The "sunshine" vitamin is a hot topic that attracted ample attention over the past decades, specially that a considerable proportion of the worldwide population are deficient in this essential nutrient. Vitamin D was primarily acknowledged for its importance in bone formation, however; increasing evidence point to its interference with the proper function of nearly every tissue in our bodies including brain, heart, muscles, immune system and skin. Thereby its deficiency has been incriminated in a long panel of diseases including cancers, autoimmune diseases, cardiovascular and neurological disorders. Its involvement in the pathogenesis of different dermatological diseases is no exception and has been the subject of much research over the recent years. In the current review, we will throw light on this highly disputed vitamin that is creating a significant concern from a dermatological perspective. Furthermore, the consequences of its deficiency on the skin will be in focus.
Keywords: Vitamin D; Deficiency; Dermatology; Immunological.

858. Acroosteolysis Presenting with Brachyonychia Following Exposure to Cold

M.H.M. EL-Komy and R. Baran

Background: A vast number of conditions ranging from simple trauma to hereditary and collagen vascular disease had been described in association with acroosteolysis.
Objective: To demonstrate that severe cold exposure not mounting to frostbite may be associated with acroosteolysis.
Methods: A 16-year-old girl with acroosteolysis presenting with brachyonychia was fully investigated for possible cause of her nail and bone deformity.
Results: Lab investigations including Parathormone levels, Anti Scl 70, ANA, Anti-CCP and RF levels were all normal. X-ray imaging revealed resorption of the tufts of the terminal phalanges bilaterally. Disruption of nail fold capillaries with sluggish flow in capillary loops was evident on capillaroscopy.
Conclusion: It had been repeatedly reported that frostbite, Raynaud's disease and diseases associated with repeated chilblains may be associated with secondary cold-induced acroosteolysis. Here, we present a case of acroosteolysis associated with brachyonychia following exposure to severe cold not mounting to frostbite.
Keywords: Brachyonychia; Acroosteolysis; Nail.

859. Medical Ethical Standards in Dermatology: An Analytical Study of Knowledge, Attitudes and Practices

W.Z. Mostafa, R.M. Abdel Hay and M.I. El Lawindi

Medicine Sector

Background Dermatology practice has not been ethically justified at all times.

Objective The objective of the study was to find out dermatologists' knowledge about medical ethics, their attitudes towards regulatory measures and their practices, and to study the different factors influencing the knowledge, the attitude and the practices of dermatologists.

Methods This is a cross-sectional comparative study conducted among 214 dermatologists, from five Academic Universities and from participants in two conferences. A 54 items structured anonymous questionnaire was designed to describe the demographical characteristics of the study group as well as their knowledge, attitude and practices regarding the medical ethics standards in clinical and research settings. Five scoring indices were estimated regarding knowledge, attitude and practice. Inferential statistics were used to test differences between groups as indicated. The Student's t-test and analysis of variance were carried out for quantitative variables. The chi-squared test was conducted for qualitative variables. The Results were considered statistically significant at a $P > 0.05$.

Results Analysis of the possible factors having impact on the overall scores revealed that the highest knowledge scores were among dermatologists who practice in an academic setting plus an additional place; however, this difference was statistically non-significant ($P = 0.060$). Female dermatologists showed a higher attitude score compared to males ($P = 0.028$). The highest significant attitude score ($P = 0.019$) regarding clinical practice was recorded among those practicing cosmetic dermatology. The different studied groups of dermatologists revealed a significant impact on the attitude score ($P = 0.049$), and the evidence-practice score ($P < 0.001$).

Conclusion Ethical practices will improve the quality and integrity of dermatology research.

Keywords: Dermatology; Knowledge; Practice.

860. Platelet-rich Plasma for Resistant Oral Erosions of Pemphigus Vulgaris: A Pilot Study

Mohamed Hussein Medhat EL-Komy, Akmal Saad Hassan, Heba Mohammed Abdel Raheem, Sally Sameh Doss, Mona EL-Kaliouby, Noha Adly Saleh and Marwah Adly Saleh

Oral erosions and ulcers of pemphigus vulgaris (PV) are a debilitating condition that is usually difficult to treat. The wound healing properties of platelet-rich plasma (PRP) encouraged us to evaluate its usefulness in treatment of non-healing oral PV lesions. Seven patients with chronic oral PV, resistant to conventional therapy, were treated with weekly to monthly injections of PRP of affected mucosal membranes. All recruits reported improvement in pain and mastication and 6 of 7 patients had an improvement in pemphigus disease area index scores with PRP treatment. PRP injections seems to accelerate the healing process and decrease the pain and eating discomfort associated with the oral erosions and ulcers induced by PV.

Keywords: Autoimmune bullous diseases; Pemphigus; Platelet rich plasma.

861. Efficacy of Different Modes of Fractional CO$_2$ Laser in the Treatment of Primary Cutaneous Amyloidosis: A Randomized Clinical Trial

Samia M. Esmat, Marwa M. Fawzi, Heba I. Gawdat, Heba S. Ali and Safinaz S. Sayed

Background: Primary cutaneous amyloidosis (PCA) comprises three main forms: macular, lichen, and nodular amyloidosis. The current available treatments are quite disappointing. Objectives: Assess and compare the clinical and histological changes induced by different modes of Fractional CO2 laser in treatment of PCA.

Patients and Methods: Twenty five patients with PCA (16 macular and 9 lichen amyloidosis) were treated by fractional CO2 using; superficial ablation (area A) and deep rejuvenation (area B). Each patient received 4 sessions with 4 weeks intervals. Skin biopsies were obtained from all patients at baseline and one month after the last session. Patients were assessed clinically and histologically (Congo red staining, polarized light). Patients were followed-up for 3 months after treatment.

Results: Both modes yielded significant reduction of pigmentation, thickness, itching, and amyloid deposits (P-value<0.001). However, the percentage of reduction of pigmentation was significantly higher in area A (Pvalue ¼0.003). Pain was significantly higher in area B. Significant reduction in dermal amyloid deposits denotes their trans-epidermal elimination induced by fractional photothermolysis.

Conclusion: Both superficial and deep modes of fractional CO2 laser showed comparable efficacy in treatment of PCA. Superficial mode being better tolerated by patients, is recommended as a valid therapeutic option.

Keywords: Primary cutaneous amyloidosis; Fractional CO$_2$; Superficial ablation; Deep rejuvenation.

862. 1064 Nd:YAG Laser for the Treatment of Chronic Paronychia: a Pilot Study

M. H. M. EL-Komy and N. Samir

Paronychia, which can be acute or chronic, is characterized by erythema, edema, and tenderness at the proximal and occasionally lateral nail folds. Causes of chronic paronychia include excessive moisture, contact irritants, trauma, and candida infection. Chronic paronychia is usually multifactorial and difficult to treat. The aim of the present work was to assess the role of neodymium-doped yttrium aluminium garnet (Nd:YAG) laser as a new modality for the treatment of chronic paronychia. In this interventional pilot study, eight female patients suffering from long-standing paronychia received 2–5 Nd:YAG laser sessions (4 weeks apart). Fluences ranged between 70 to 80 J/cm^2, using a 2.5-mm spot size handpiece, and pulse duration was set at 0.7 ms. Patients were digitally photographed and clinically evaluated before starting the treatment and at each session. Seven of our patients showed various degree of improvement regarding erythema and swelling of their proximal nail folds. Nail plate abnormalities also improved in six patients. These preliminary results document the efficacy and feasibility of Nd:YAG laser as one of the treatments that could ameliorate chronic paronychia.

Keywords: Paronychia; Nd:YAG laser.

863. Gene Expression of Osteopontin in Alopecia Areata? A Case Controlled Study

Amr A. Rateb, Faisal N. Mohammed, Khadiga S. Sayed, Rehab A. Hegazy, Razan R. Al Agha, Laila A. Rashed and Safinaz S. Sayed

Purpose of the Study: To study the expression of osteopontin (OPN) in alopecia areata (AA) lesions in a trial to clarify its possible role in the pathogenesis of such a disease. Procedures: Tissue level of OPN was measured in 28 AA patients as well as 25 age- and sex-matched healthy controls using both real-time polymerase chain reaction (PCR) and immunohistochemistry.
Results: The tissue level of OPN by real-time PCR (4.5–12.8, 8.93 ± 1.9) and immunohistochemical expression of positive OPN mean area percent (7.1–21.2%, $12 \pm 5.5\%$) were significantly higher in patients compared to controls (1–4.6, 2.11 ± 0.93; 3.9–12.02%, $6.8 \pm 2.8\%$, respectively; $p < 0.0000$). The Severity of Alopecia Tool score showed no significant correlation with the OPN mRNA expression ($r = 0.11$, $p = 0.55$).
Conclusion: High OPN mRNA expression is associated with AA. OPN might play an important role in the pathogenesis of AA.
Keywords: Alopecia areata; Osteopontin; Inflammation; Cytokine.

864. Low Pathogenicity of Anti-desmoglein 3 Immunoglobulin G Autoantibodies Contributes to the Atypical Clinical Phenotypes in Pemphigus

Marwah A. Saleh, Rena Hashimoto, Yuko Kase, Masayuki Amagai and Jun Yamagami

The clinical phenotypes of pemphigus can be explained by the desmoglein (Dsg) compensation theory. However, some atypical cases such as cutaneous pemphigus vulgaris (cPV), in which patients have anti-Dsg3 antibodies without oral erosions, do not conform to this theory. To explain the discrepancy between clinical phenotypes and anti-Dsg antibody profiles, the pathogenic strength of immunoglobulin (Ig)G autoantibodies against Dsg3 must be taken into consideration. We analyzed the epitopes and blister-inducing pathogenic strength of the sera from three patients having IgG against Dsg3 without oral erosions with domain-swapped recombinant proteins and dissociation assay using cultured normal human epidermal keratinocytes. The Results showed that all sera contained IgG directed against the amino terminal EC1 domain of Dsg3, as is found in most PV sera. However, dissociation assays revealed that the pathogenic strength of the anti-Dsg3 antibodies in all three cases was extremely lower than that of typical PV cases with mucosal involvement. In Conclusion, when anti-Dsg3 IgG antibodies are not sufficient to inhibit the expression of Dsg3 in the oral mucosa, but can inhibit the expression in the skin, skin blisters can result. Therefore, the pathogenicity of anti-Dsg3 antibodies should be regarded as a key factor contributing to the clinical phenotype in pemphigus patients with conflicting antibody profiles.
Keywords: Autoimmune bullous diseases; Anti-desmoglein 3; Pemphigus.

865. Pemphigus in the Arab World

Marwah A. Saleh

The Arab world lies geographically between the Atlantic coasts of northern Africa and the Arabian Gulf. This area has wide latitudinal differences as well as variable environmental conditions ranging from deserts to forests. Approximately 370 million individuals who share the Arabic language live in this area. Pemphigus vulgaris (PV) and pemphigus foliaceus (PF) are the main subtypes of the pemphigus disease. Both pemphigus subtypes are present in many Arab countries; however, there is variation in the predominant subtype among countries. PV is the most common subtype in Egypt, Sudan, Morocco, Syria, Kuwait, Saudi Arabia and Yemen. On the other hand, PF is more prevalent in Libya and is endemic in Tunisia. Interestingly, there is variation in the dominant subtype in some cities within Morocco. For example, PF is more common in Marrakech which is the second largest city. The presence of anti-desmoglein 1 antibodies in the sera of normal Tunisians and the presence of anti-desmoglein 3 in normal Egyptians' sera suggested that environmental factors played a role in the disease pathogenesis in those areas. Further researches detected that traditional cosmetics were among the risk factors in Tunisia. Moreover, farming was suggested as a risk factor in Egypt, Tunisia and Sudan. Because there is no consensus for pemphigus treatment among the Arab countries, there is diversity in their pemphigus treatment regimens. Studying the demographic characteristics and the environmental conditions which caused the variations in the prevailing clinical phenotype will help us fill the gaps to understand the pathogenesis of the pemphigus disease.
Keywords: Arab; Autoimmune bullous diseases; Anti-desmoglein 3; Pemphigus; Vularis.

866. Combination of Radiofrequency and Intralesional Steroids in the Treatment of Keloids: A Pilot Study

Ahmed Hany Weshay, Rania Mounir Abdel Hay, Khadiga Sayed, Marwa Safwat El Hawary and Faisal Nour-Edin

Background: None of therapeutic options for the treatment of keloids has been found completely effective and satisfactory. A combination approach is the best modality.
Objective To assess the clinical safety and efficacy of radiofrequency (RF) followed by intralesional (IL) steroid injection in keloids.
Materials and Methods: This pilot study included 18 patients who were suffering from keloids. All patients were subjected to 3 to 4 sessions of RF followed by IL steroid injection. Assessment of the scar volume and both objective and subjective parameters has been performed before and after completion of the sessions.
Results: There was a significant reduction of volume of all lesions in all patients after a total of 3 to 4 sessions ($p = .001$), with a mean volume reduction of 95.4%. There was a significant reduction of keloid pliability, height, and erythema compared with baseline ($p < .001$). Patients reported a significant reduction of their subjective symptoms compared with baseline ($p < .001$). No pain, infection, nor bleeding were reported after the RF procedure.

Medicine Sector

Conclusion: Radiofrequency tissue volume reduction combined with IL steroid is an effective treatment modality for keloids. It is an easy procedure with acceptable cosmetic outcome and less rate of recurrence.

Keywords: Keloid; Radiofrequency; Steroid.

867. Study of T Helper 1 and T Helper 2 Responses in Pemphigus Vulgaris Patients Receiving Interferon Alpha 2A Injections in Addition to A Standard Protocol Therapy: A Randomized Controlled Trial

Mohammad A. El-Darouti, Rehab A. Hegazy, Rania M. Abdel Hay, Marwa S. El Hawary, Amira M. Tawdy, Marwa M. Fawzy and Laila A. Rashed

Archives of Dermatological Research, 307: 299-307 (2015) IF: 1.902

T helper (Th)1 insufficiency was recently found to be related to the pathogenesis of pemphigus vulgaris (PV). Decreased Th1 response was particularly noticed in the early stages of PV. Therefore, administration of interferon alpha in the early stages of aggressive PV may lead to rapid control of the acute stage of the disease. Our aim was to evaluate the role of interferon alpha in the treatment of PV. 30 patients with acute severe PV (>60 % affection) and 30 age and sex-matched healthy subjects were included in this RCT. Patients were randomly divided into two groups (A and B). Group B patients received interferon retard (one subcutaneous injection/week for 4 weeks) in addition to our protocol for the treatment of PV (systemic pulse corticosteroids/cyclophosphamide in combination with sulphasalazine and pentoxifylline) that was administered to all the included patients. IFN-γ and IL-4 were estimated by ELISA before treatment, after 4 weeks and at the end of the study duration (12 weeks). Clinical assessment was done by PAAS on a biweekly basis. All PV patients showed significantly (P < 0.001) elevated levels of IL-4 and significantly (P < 0.001) depressed mean concentration of IFN-γ as compared with healthy controls. Twelve weeks after therapy both groups showed significant improvement in their mean PAAS being more evident and more rapid in group B. IFN-γ was elevated significantly and IL-4 was dropped significantly in group B patients in comparison to group A (P < 0.001). As a Conclusion, interferon therapy in severe PV could achieve a more prompt and better clinical response.

Keywords: Acantholysis; Blistering disease; Interferon-gamma; Interleukin-4.

868. The Efficacy of Intralesional Cryosurgery in the Treatment of Small-and Medium-sized Basal Cell Carcinoma: A Pilot Study

Ahmed H. Weshahy, Rania M. Abdel Hay, Dina Metwally, Omar A. Weshahy and Zeiad Gad

J. of Dermatological Treatment, 26: 147-150 (2015) IF: 1.669

Background: Cryotherapy has been used in treatment of basal cell carcinoma (BCC). In 1993, Weshahy described his technique for applying cryotherapy in depth, i.e. intralesional cryosurgery (ILC), using Weshahy's cryoneedles.

Objective To assess the clinical efficacy of ILC using Weshahy cryoneedles in the treatment of small- and medium-sized BCC with >5-year follow-up.

Patients and Methods: This pilot study included 43 patients with histopathologically proven BCCs of the nodular and superficial type. All BCCs were treated by Intralesional cryosurgery (Weshahy's technique) using specially designed angled or hook shaped needles.

Results: The study included 22 men (51.2%) and 21 women (48.8%). Out of 46 lesions, 45 lesions (97.8%) showed a cure in one session, and only 1 nodular lesion showed a small recurrence in a marginal region of the site treated. In relation to the cosmetic outcome, 32 (69.6%) lesions showed a good to excellent outcome, 11 (23.9%) a moderate to good outcome and 3 (6.5%) a poor cosmetic outcome. The cosmetic outcome was better in females (p¼0.578), with small lesions (p¼0.048), and between 40 and 70 years old (p¼0.046).

Conclusion: Cryotherapy is an alternative treatment for a small- to medium-sized BCC in selected patients.

Keywords: Basal cell carcinoma; Cryotherapy; Intralesional cryosurgery.

869. Clinical Effects of "Pioglitazone", an Insulin Sensitizing Drug, on Psoriasis Vulgaris and Its Co-Morbidities, A Double Blinded Randomized Controlled Trialx1

Hafez VG, Bosseila M, Abdel Halim MR, Shaker OG, Kamal M and Kareem HS.

Dermatol Treat, 26 (3): 208-214 (2015) IF: 1.669

Objectives: To evaluate the therapeutic efficacy of pioglitazone on psoriasis vulgaris and its comorbidities.

Materials and Methods: Forty-eight patients with moderate-to-severe psoriasis vulgaris were enrolled in this randomized double blinded placebo-controlled trial. Active treatment included: oral pioglitazone 30mg daily for 10 weeks. Primary outcome (treatment success) was PASI-75. Secondary outcomes included changes in metabolic syndrome, insulin resistance and cardiovascular risk.

Results: Treatment success was achieved in 5/24 (21%) in the pioglitazone group compared to 1/24 (4%) in the placebo group; however, this difference was not significant (p=0.081). Compared to placebo, no significant difference existed as regards high-sensitive C reactive protein. Metabolic syndrome and insulin resistance were not affected.

Conclusions: This short term (10 weeks duration) study revealed no effect of pioglitazone 30mg daily neither on the clinical response of moderate-to-severe psoriasis nor on metabolic syndrome and insulin resistance. Cardio-protective role appears to be more related to improvement of psoriasis. LIMITATION: Short duration of treatment and small number of subgroups.

Keywords: Cardiovascular risk; Insulin resistance; Metabolic syndrome; Pioglitazone; Psoriasis; Randomized controlled trial.

870. Evaluation of Angiogenesis in Early Mycosis Fungoides Patients: Dermoscopic and Immunohistochemical Study

Manal Bosseila, Khadiga Sayed Sayed, Safinaz Salah El-Din Sayed and Noha Ali Abd El Monaem

Dermatology, 231(1): 82-86 (2015) IF: 1.569

Background: Angiogenesis is the production of new blood vessels from an existing vascular network; it plays a critical role in solid tumor development and metastasis.

Objectives: To assess angiogenesis in early cases of mycosis fungoides (MF) and to determine vascular patterns in MF dermoscopically.

Methods: 25 patients with MF and 20 healthy controls were included. The MF lesions were assessed dermoscopically. CD34 immunohistochemistry was performed to count dermal microvessel density (MVD).

Results: The total dermal MVD was significantly higher in MF patients (19.77 ± 5.81) than in controls (4.44 ± 3.16; p = 0.013). Among them, there were 10.8 ± 4.1 sprouts of endothelial buds (clusters of cells per field) in patients and 2.4 ± 2 in controls (p = 0.000). The dotted pattern of blood vessels was the most frequently encountered pattern in the MF lesions by dermoscopy.

Conclusions: Our findings support that neoangiogenesis is significantly increased in early MF lesions and that the main dermoscopic feature of MF is dotted blood vessels.

Keywords: Angiogenesis; Dermoscopy; Cd34; Mycosis fungoides.

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871. Bimatoprost Versus Mometasone Furoate in the Treatment of Scalp Alopecia Areata: A Pilot Study

Hesham Zaher, Heba I. Gawdat, Rehab A. Hegazy and Marwa Hassan

Dermatology, 230: 308-313 (2015) IF: 1.569

Background: Alopecia areata (AA) is an immune-mediated disease that targets anagen hair follicles. Despite various therapeutic options, there is no cure for AA. Prostaglandin analogues have been recognized as being capable of inducing hypertrichosis.

Objective To compare the efficacy and safety of bimatoprost to those of corticosteroid in the treatment of scalp AA.

Methods: Thirty adult patients with patchy AA (S1) were included. Two AA patches were randomly assigned to treatment either by mometasone furoate 0.1% cream once daily (area A) or bimatoprost 0.03% solution twice daily (area B) for 3 months. Patients were assessed using the Severity of Alopecia Tool (SALT) scoring system for hair re-growth.

Results: All responding AA patches showed significant reduction in their SALT score after therapy. Area B demonstrated significantly better Results regarding rapidity of response in weeks, percentage of hair re-growth and side effects compared to area A.

Conclusion: Bimatoprost solution represents a therapeutic option for scalp AA.

Keywords: Alopecia areata; Bimatoprost; Corticosteroids; Efficacy; Side effects.

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872. Frequency of Hypopigmented Mycosis Fungoides in Egyptian Patients Presenting with Hypopigmented Lesions of the Trunk

Mona Abdel-Halim, Eman El-Nabarawy, Reham El Nemr and Abeer M. Hassan

American Journal of Dermatopathology, 37: 834-840 (2015) IF: 1.387

Hypopigmented mycosis fungoides (HMF) is an uncommon variant of mycosis fungoides with an unknown exact frequency. We aimed to study the frequency of HMF in a cohort of Egyptian patients presenting to a tertiary care center in Cairo, Egypt, with hypopigmented lesions of the trunk. Hundred patients with hypopigmented lesions involving the trunk (with or without other sites involvement) were subjected to thorough clinical and histopathological examination. Immunohistochemical studies (S100, CD4, and CD8) were performed when indicated. Constellation of findings was used to reach a final diagnosis. Sixteen cases had HMF (16%). Other than HMF, our cohort included hypopigmented parapsoriasis en plaque (42 cases), postinflammatory hypopigmentation (28 cases), progressive macular hypomelanosis (12 cases), and pityriasis alba (2 cases). In comparison with other hypopigmented disorders, HMF was significantly associated with progressive disease course (P = 0.004), affection of distal upper limbs (P = 0.005), proximal lower limbs (P = 0.003), large-sized lesions (.5 cm) (P , 0.0001), well-defined margin (P , 0.0001), scaliness (P = 0.002), erythema (P , 0.0001), atrophy (P = 0.012), and mottled pigmentation (P , 0.0001). Awareness of HMF and its characteristic clinical features is mandatory to avoid underdiagnosis or overdiagnosis with subsequent morbidity or unnecessary aggressive therapy, respectively.

Keywords: Hypopigmented mycosis fungoides; Hypopigmented lesions; Frequency; Histopathology; Epidermotropism; CD4; CD8.

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873. Do Normal Egyptians Possess Anti-desmoglein 3 Antibodies?

Marwah A. Saleh and Mohamed M. El-Bahy

International Journal of Dermatology, 54: 1145-1149 (2015) IF: 1.312

Background: Pemphigus is a group of autoimmune blistering diseases targeting the cell-cell adhesion molecules, desmogleins (Dsgs). Anti-Dsg antibodies, the hallmark of the disease, were not detected in normal individuals in many populations. In spite of the rarity of pemphigus vulgaris (PV) disease in many parts of the world, PV is not rare in Egypt. The purpose of the present study is to investigate the presence of anti-Dsg3 antibodies in normal Egyptians aiming to determine the reason for the increase in number of patients in Egypt with pemphigus.

Methods: Anti-Dsg3 antibodies were evaluated in 200 normal human sera, 20 first-degree relatives with PV in comparison with 10 patients with PV as controls using the enzyme-linked immunosorbent assay technique.

Results: Fourteen of 200 (7%) normal individuals and two of 20 (10%) first-degree relatives with PV had anti-Dsg3 antibodies using enzyme-linked immunosorbent assay technique, and 11 of 16 were still positive after confirmation by indirect immunofluorescence. The sera were positive for IgG1, IgG3, and IgG4 subclasses. The presence of IgG4 subclass in normal individuals is suggestive that they may be in the preclinical stage and therefore are at higher risk to develop the PV disease.

Conclusion: The study proved the presence of anti-Dsg3 antibodies in normal Egyptians with significant relation to some environmental factors. Follow-up of those individuals is necessary to determine who will develop the disease and the triggering factors.

Medicine Sector

874. Are Normolipidaemic Patients with Xanthelasma Prone to Atherosclerosis?

S. Esmat, M. R. E. Abdel-Halim, M. M. Fawzy, S. Nassef, S. Esmat, T. Ramzy and E. S. El Fouly

Background.When patients with xanthelasma are found to have normal lipid levels, dermatologists usually proceed with their treatment without further investigations. However, there is some evidence that normolipidaemic patients with xanthelasma (NPX) have a similar cardiovascular risk to hyperlipidaemic patients with xanthelasma (HPX). Aim. To evaluate the risk of atherosclerosis in Egyptian NPX compared with HPX and controls.
Methods. In total, 20 NPX, 20 HPX and 40 normolipidaemic controls were enrolled. All participants were matched for age and sex. Diabetes was an exclusion factor. Carotid ultrasonography was used to measure intima–media thickness (IMT). Other risk factors of atherosclerosis such as high blood pressure, obesity and smoking were also assessed, as well as atherosclerotic markers, including total leucocytic count (TLC), C-reactive protein and lipoprotein a.
Results. Although still within the normal range, total cholesterol and triglycerides were significantly higher in NPX compared with controls. IMT was significantly higher in NPX compared with controls, but lower than that of HPX. The increased IMT in NPX was not related to any of the studied risk factors. Apart from significantly higher body mass index and TLC, NPX showed no significant differences from controls for other risk factors of atherosclerosis or for atherosclerotic markers.
Conclusion. NPX seem to have a higher risk of atherosclerosis independent of lipid concentrations, and should therefore be fully investigated in order to allow detection and early management of such risk.
Keywords: Xanthelasma; Atherosclerosis.

875. Kallin Syndrome Associated with Vitiligo

M. A. El Darouti, M. S. El Hawary and R. M. Abdel Hay

Kallin syndrome (KS) is a variant of epidermolysis bullosa simplex (EBS), which, in addition to the classic features of EBS, also presents with deafness, alopecia, hypodontia and nail dystrophy. We report the case of a 17-year-old boy who presented to our clinic with trauma-induced skin blistering, alopecia, deafness, dental caries, nail dystrophy and vitiliginous areas. The skin blisters had been appearing since birth, and healed without scarring. The vitiliginous areas were unrelated to the sites of the blisters. Electron microscopy of the skin blisters was diagnostic of EBS, and the depigmented lesions were similar to those of vitiligo. An association of vitiligo with EBS has not been reported previously. Multiple genetic findings have confirmed a role for keratin in regulating skin pigmentation. Apoptosis of melanosome-bearing keratinocytes may participate in the reduction of melanin density and result in depigmentation. Further studies on the defective proteins in KS may clarify the mechanism underlying the association with vitiligo.

876. Reduction in Tissue Plasmin: A New Mechanism of Action of Narrowband Ultraviolet B in Psoriasis

D. Metwally, K. Sayed, R. Abdel Hay and L. Rashed

Background Plasmin (PL) is a potent inflammatory cell activator, and ultraviolet (UV)B has immunomodulatory effects on cutaneous inflammatory responses. There are no previous studies comparing the effect of narrowband (NB)-UVB on tissue PL levels in psoriasis. Aim To estimate the possible role of PL in the pathogenesis of psoriasis, and to evaluate the effect of NB-UVB on tissue PL in psoriasis.
Methods This case–control study enrolled 21 patients with psoriasis and 20 clinically healthy volunteers matched for age and sex. Patients underwent 24 sessions of NB-UVB radiation. Biopsy samples using a 4 mm punch were taken from all patients before and after treatment and from the controls for estimation of tissue PL level by ELISA.
Results Tissue PL was significantly upregulated in psoriasis before treatment (mean $\pm$ SD 1.73 $\pm$ 1.23 ng/mg protein) compared with controls (0.21 $\pm$ 0.15 ng/mg protein) (P < 0.001). A statistically significant positive correlation (P = 0.02) was found between the tissue PL before treatment and the Psoriasis Area and Severity Index. Patients received 24 sessions of NB-UVB, with a mean cumulative dose of 23.25 $\pm$ 8.14 mJ/cm2. Tissue PL levels were reduced by a mean of 30.3% post-treatment compared with baseline (P < 0.001). The reduction in Pl levels was significantly correlated with the cumulative dose of NB-UVB, and with the percentage reduction in PASI (P < 0.001).
Conclusions Our study highlights the possible role played by tissue PL level in the pathogenesis of psoriasis. PL level appears to reflect disease severity, and is a possible marker of therapeutic efficacy of NB-UVB on psoriatic skin.

877. Intralesional Botulinum Toxin Type A Equally Effective and Better Tolerated Than Intralesional Steroid in the Treatment of Keloids: A Randomized Controlled Trial

Eman Shaarawy, Rehab A. Hegazy and Rania M. Abdel Hay

Intralesional (IL) corticosteroid therapy is a treatment for keloids. IL botulinum toxin type A (BTA) has been postulated in such an indication with controversial reports. To compare efficacy and safety of IL BTA to the IL corticosteroid therapy in treatment of keloids. Twenty-four patients with keloids were randomly divided into two equal groups: receiving IL steroid repeated every 4 weeks for six sessions (group A) and IL BTA 5 IU/cm3 repeated every 8 weeks for three sessions (group B). Objective parameters (hardness, elevation, and redness), subjective complaints (itching,

pain, and tenderness), patient satisfaction, and side effects were evaluated. There was a significant decrease in the volume of the lesions after treatment (P < 0.01), with a volume reduction of 82.7% and 79.2%, respectively, in both groups. A significant softening of lesions vs. baseline was observed (P < 0.01), with statistically significant improvement in softening in group A (P < 0.01). There was a significant decrease in height of lesions and in redness score compared with baseline (P < 0.01) with no significant difference in between both groups. All patients mentioned a significant reduction of their subjective complaints (P < 0.01) that were more significant in group B. Skin atrophy and telangiectasia were evident in three patients of group A. The efficacy and safety of the IL BTA were clearly evident in the current work from the rapid significant amelioration of the subjective complaints and the comparable significant improvement of the objective parameters as well as the volume of the keloids in comparison with the IL corticosteroids.

Keywords: Botulinum toxin; Intralesional steroids; Off-label indication; Scar.

878. Crude Coal Tar and Ultraviolet (UV) A Radiation (Modified Goeckerman Technique) in Treatment of Psoriasis

Mohamed A. EL Darouti, Heba I. Gawdat, Rehab A. Hegazy, Amira El Tawdy, Marwa M. Fawzy and Dalia M. AbdelHalim

Psoriasis is a chronic inflammatory dermatosis that has a substantial impact on the quality of life. Goeckerman's technique (GT) has been implemented for the treatment of psoriasis with high clearance rates and long periods of remission. The objective of this article was to evaluate the efficacy and safety of modified GT (crude coal tar 2.5% plus UVA) as an alternative therapeutic modality for psoriatic patients with skin types III-V. Twenty two patients with moderate, severe, and erythrodermic psoriasis were included in this study. All patients received modified GT (crude coal tar 2.5% plus UVA) six days per week for a period of 3 months. Assessment of the rate of reduction of psoriasis area severity index (PASI) was performed, as well as photographic documentation of each patient at baseline and after completion of therapy. There was a significant reduction in PASI scores after therapy in all patients (P=0.001). The rate of PASI reduction after therapy was >50% in 63.6% of patients; 27.3% of patients achieved >75% reduction and 9.1% of patients achieved 26-50% reduction. No serious side effects were reported in any of the patients. Modified GT is a safe and effective therapeutic option for patients with moderate and severe psoriasis.

Keywords: Psoriasis; Modified goeckerman'S technique; Efficacy; Safety.

Dept. of Diagnostic Radiology

879. Diagnostic Value of Combined Static-Excretory MR Urography in Children with Hydronephrosis

Sally Emad-Eldin, Omar Abdelaziz and Tarek A. El-Diasty

The aim of this study was to determine the feasibility, accuracy and diagnostic potential of com- bined static-excretory MR Urography in children with sonographically detected hydronephro- sis. We prospectively evaluated 28 children (11 girls and 17 boys), mean age 8.3 years (range 2 months–16 years). Static-excretory MR Urography was performed in all cases. The Results of MR Urography were compared with the Results of other imaging modalities, cystoscopy and surgery. In 28 children, 61 renal units were evaluated by MR Urography (the renal unit is the kidney and its draining ureter). The final diagnoses included: normal renal units (n = 23); uretropelvic junction obstruction (n = 14); megaureter (n = 8); midureteric stricture (n = 1), complicated duplicated systems (n = 5), post ESWL non-obstructive dilation (n = 2), extrarenal pelvis (n = 4), dysplastic kidney (n = 4). Complex pathology and more than one disease entity in were found in 7 children. The MRI diagnosis correlated with the final diagnosis in 57 units, with diagnostic accuracy 93.4%. In Conclusions static and excretory MRU give both morphological and functional information in a single examination without exposure to ionizing radiation and iodinated contrast agent. It is a valuable imaging technique for children with upper urinary tract dilatation; especially in cases of complex congenital pathologies and severely hydronephrotic kidney.

Keywords: Static MRU; Excretory MRU; Pediatrics; Dilated urinary tract.

880. Anatomical-based Model for Simulation of HIFU-Induced Lesions in Atherosclerotic Plaques

Mohamed K. Almekkaway, Islam A. Shehata and Emad S. Ebbini

Purpose: The aim of this study was to simulate the effect of high intensity focused ultrasound (HIFU) in non-homogenous medium for targeting atherosclerotic plaques in vivo.

Materials and Methods: A finite-difference time-domain heterogeneous model for acoustic and thermal tissue response in the treatment region was derived from ultrasound images of the treatment region. A 3.5 MHz dual mode ultrasound array suitable for targeting peripheral vessels was used. The array has a lateral and elevation focus at 40 mm with fenestration in its centre through which a 7.5 MHz diagnostic transducer can be placed. Two cases were simulated where seven adjacent HIFU shots (~5000 W/cm2, 2-s exposure time) were targeted on the plaque tissue within the femoral artery. The transient bioheat equation with a convective term to account for blood flow was used to predict the thermal dose. The Results of the simulation model were then validated against the histology data.

Results: The simulation model predicted the HIFU-induced damage for both cases, and correlated well with the histology data. For the first case thermal damage was detected within the targeted plaque, while for the second case thermal damage was detected in the pre-focal region.

Conclusion: The Results suggest that a realistic, image-based acoustic and thermal model of the treatment region is capable of predicting the extent of thermal damage to target plaque tissue. The model considered the effect of the wall thickness of large arteries and the heat-sink effect of flowing blood. The model is used for predicting the size and pattern of HIFU damage in vivo.

Keywords: Atherosclerosis; HIFU; Numerical simulation; Therapeutic ultrasound; Thermal ablation.

Medicine Sector

881. Contrast-Enhanced Spectral Mammography: Impact of the Qualitativemorphology Descriptors on the Diagnosis of Breast Lesions

Rasha Mohamed Kamal, Maha Hussien Helal, Rasha Wessam, Sahar Mahmoud Mansour, Iman Godda and Nelly Alieldin

Objective To analyze the morphology and enhancement characteristics of breast lesions on contrast-enhanced spectral mammography (CESM) and to assess their impact on the differentiation between benign and malignant lesions. Materials and method: This ethics committee approved study included 168 consecutive patients with211 breast lesions over 18 months. Lesions classified as non-enhancing and enhancing and then thelatter group was subdivided into mass and non-mass. Mass lesions descriptors included: shape, margins,pattern and degree of internal enhancement. Non-mass lesions descriptors included: distribution, pattern and degree of internal enhancement. The impact of each descriptor on diagnosis individually assessed using Chi test and the validity compared in both benign and malignant lesions. The overall performance of CESM were also calculated. **Results**: The study included 102 benign (48.3%) and 109 malignant (51.7%) lesions. Enhancement was encountered in 145/211 (68.7%) lesions. They further classified into enhancing mass (99/145, 68.3%) and non-mass lesions (46/145, 31.7%). Contrast uptake was significantly more frequent in malignant breast lesions (p value =0.001). Irregular mass lesions with intense and heterogeneous enhancement patterns correlated with a malignant pathology (p value =0.001). CESM showed an overall sensitivity of 88.99%and specificity of 83.33%. The positive and negative likelihood ratios were 5.34 and 0.13 respectively. **Conclusion**: The assessment of the morphology and enhancement characteristics of breast lesions onCESM enhances the performance of digital mammography in the differentiation between benign andmalignant breast lesions. **Keywords**: Digital mammography; Contrast-enhanced spectral mammography; Breast lesions; Morphology lexicon.

882. Semi-quantitative Contrast-enhanced MR Analysis of Indeterminate Ovarian Tumours: When to Say Malignancy?

S. M. Mansour, S. Saraya and Y. El-Faissal

Objective To evaluate the ability of dynamic post-contrast sequence to specify indeterminate ovarian masses with inconclusive MR features of malignancy. Since management is dramatically different, special focus on the ability to differentiate borderline from invasivemalignancywas considered. **Methods**: 150 ovarian masses were detected by pelvic ultrasound in 124 patients. Masses had been considered for dynamic post-contrast MRI. We expressed the kinetic parameters (i.e. enhancement amplitude, time peak of maximal uptake and maximal slope) in the form of maximum relative enhancement percentage (MRE%), time of maximal peak of contrast uptake (Tmax) and slope enhancement ratio (SER) curves. Histological findings were the gold standard of reference. **Results**: Malignant ovarian masses showed higher MRE% than benign and borderline masses (p,0.001). Tmax was shorter for

malignant than benign (p,0.01) and borderline (p,0.001) ovarian masses. SER curves were the most suggestive of malignancy with a specificity and accuracy of 85.7% and 84.7%, respectively. **Conclusion**: Dynamic contrast-enhanced MRI could be a specific sequence to differentiate ovarian masses with indeterminate MR morphology with a special discrimination for low potential from invasive ovarian malignancy. **Advances in knowledge**: The study evaluated the diagnostic performance of the individual parameters of dynamic post-contrast MR sequence in evaluating ovarian masses. Management divert between benign, borderline and invasive malignant masses; our work presented a cut-off value for the peak of contrast uptake of 120%, which helped in the differentiation between benign and malignant tumours; the SER curves with Type III (early washout) pattern that was indicative of invasive malignancy was more specific than borderline malignancy.

883. Intra-operative Ultrasound-Guided Thrombectomy and Thrombolysis for Post-Operative Portal Vein Thrombosis in Living Liver Donors

O. Abdelaziz, K. Hosny, O. Elmalt, S. Emad-Eldin and A. Hosny

There are few reports of portal vein thrombosis among living donor liver transplant donors and no published data on the management of this event. In this report, we present our experience in the diagnosis and management of this rare complication in two living donor liver transplantation donors who developed post-operative portal vein thrombosis. Both cases were successfully managed with intra-operative ultrasound-guided thrombectomy, vein patch venoplasty, and catheter-directed thrombolysis. The two donors are symptom-free two years after the event. **Keywords**: Liver transplant; Living donor; Portal vein; Postoperative complications; Thrombectomy; Thrombolytic therapy; Venoplasty.

884. Residual Breast Cancer or Post Operative Changes: Can Diffusion-weighted Magnetic Resonance Imaging Solve the Case?

Sahar M. Mansour and Noha Behairy

Objective To evaluate the ability of Diffusion weighted MR imaging (DWI), as a noninvasive sequence to differentiate between accepted post operative sequel and residual malignancy in breast cancer patients following different surgical procedures. **Patients and Methods**: DWI in addition to the routine post contrast MRI was performed for follow up of 170 post operative breasts (6–24 months). DWI acquired using b values: 0, 850, 1000 and 1500. Analysis considered signal intensity (SI) at b 1000 and the ADC map and the mean ADC values. **Results**: Post operative changes were: Edema (n=17, 10%), skin thickening (n= 25, 15.9%), seroma (n= 17, 10%), hematoma (n=5, 3%), fat necrosis (n =13, 7.6%), fibrosis (n=8, 4.7%), and

combined (n= 83, 48.8%). Residual malignancy found in 16.5% (n =28) of cases. No significant difference was noted between DWI SI at b 850 versus 1000 and b 1000 versus 1500 (P >0.05). Also no difference (P > 0.05) was noted between the mean ADC values of residual malignant masses and post operative sequel of fibrosis and fat necrosis. ADC map showed low SI in 30% of cases. Statistical analysis yielded sensitivity, specificity and accuracy of 92.8%, 75.6% and 78% for contrast MRI and 92.8%, 82.6% and 83.4% for DWI respectively.

Conclusion: DWI enhanced the diagnostic performance of MRI in differentiating residual malignancy from post operative changes.

Keywords: Diffusion imaging; MRI; Post operative; Breast cancer.

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885. Diffusion-weighted Magnetic Resonance Imaging in the Assessment of Ovarian Masses with Suspicious Features: Strengths and Challenges

Sahar Mansour, Rasha Wessam and Mariam Raafat

Objective To evaluate diagnostic performance of diffusion weighted imaging (DWI) in evaluating ovarian masses with suspicious features on magnetic resonance imaging (MRI).

Patients and Methods: Pelvic MRI and DWI assessed 235 complex and solid ovarian masses of suspicious MRI features. On DWI, scanning acquired by b values: 0, 500, 1000 and 1500. Analysis considered signal intensity (SI) at b1000 and the mean ADC values for the solid components of the masses.

Results: Included masses proved benign in 75(32%), borderline (low potential malignancy) in 55(23.4%) and malignant in 105(44.6%). Restricted diffusion was observed in all of the invasive malignancy (57.1%, n =105/184). Benign and borderline tumors with high DWI SI presented 15.2% and 27.7% respectively (P<0.05). The mean ADC value was 1.2+0.34 · 103 mm2/s, 1.1+ 0.06 · 103 mm2/s, and 0.83 + 0.15 · 103 mm2/s for benign, borderline and malignant masses respectively. The ADC values of malignant masses and benign masses with fibrous components showed no significant difference (P =0.333). Significant difference was detected in those with fatty tissue (P =0.002).

Conclusion: DWI supported by conventional MRI data can confirm or exclude malignancy in suspicious ovarian masses. The combined analysis of quantitative and qualitative criteria and knowledge of the sequence pitfalls are required.

Keywords: Diffusion-weighted; MR imaging; Ovarian tumors; ADC value.

Dept. of Ear Nose & Throat

886. Furlow Palatoplasty for Previously Repaired Cleft Palate with Velopharyngeal Insufficiency

Mosaad Abdel-Aziz, Ahmed Nassar, Mohammed Rashed, Nader Naguib and Abdel-Rahman El-Tahan

Velopharyngeal insufficiency (VPI) is a common complication after cleft palate repair, it may be due to lack of levator sling reconstruction and/or palatal shortening. Furlow palatoplasty has the advantages of retro-positioning of levator palati muscles and palatal lengthening. The aim of this study was to assess the efficacy of Furlow palatoplasty in the treatment of VPI in patients who undergone previous palatoplasty.

Methods Twenty-three children with post-palatoplasty VPI were included in the study. Furlow technique which was not used in the primary repair, has been used as a secondary corrective surgery. Preoperative and postoperative evaluation of velopharyngeal function was performed, using auditory perceptual assessment (APA) and nasometry for speech, and flexible nasopharyngoscopy for velopharyngeal closure.

Results Significant improvement of APA and nasalance score for oral and nasal sentences was achieved. Flexible nasopharyngoscopy showed complete velopharyngeal closure in 19 patients (82%) postoperatively.

Conclusion Furlow palatoplasty is considered a useful treatment option for VPI in patients with previously repaired cleft palate, it improves the speech and velopharyngeal closure.

Keywords: Furlow palatoplasty; Velopharyngeal insufficiency; Cleft palate; Hypernasality.

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887. The Association of Varicella Zoster Virus Reactivation with Bell''s Palsy in Children

Mosaad Abdel-Aziz, Noha A. Azab, Badwy Khalifa, Mohammed Rashed and Nader Naguib

Objectives: Bell's palsy is considered the most common cause of facial nerve paralysis in children. Although different theories have been postulated for its diagnosis, reactivation of the Varicella zoster virus (VZV) has been implicated as one of the causes of Bell's palsy. The aim of the study was to evaluate the association of Varicella-zoster virus infection with Bell's palsy and its outcome in children.

Methods: A total of 30 children with Bell's palsy were recruited and were assayed for evidence of VZV infection. The severity of facial nerve dysfunction and the recovery rate were evaluated according to House–Brackmann Facial Nerve Grading Scale (HB FGS). Paired whole blood samples from all patients were obtained at their initial visit and 3 weeks later, and serum samples were analyzed for VZV IgG and IgM antibodies using ELISA.

Results: A significantly higher percentage of Bell's palsy patients were seropositive for VZV IgM antibodies than controls (36.6% of patients vs 10% of controls) while for VZV IgG antibodies the difference was statistically nonsignificant. HB FGS in Bell's palsy patients with serologic evidence of VZV recent infection or reactivation showed a statistiacally significant less cure rate than other patients.

Conclusions: VZV reactivation may be an important cause of acute peripheral facial paralysis in children. The appropriate diagnosis of VZV reactivation should be done to improve the outcome and the cure rate by the early use of antiviral treatment.

Keywords: Facial paralysis; Bell's palsy; Zoster sine herpete;Varicella zoster virus.

Medicine Sector

Dept. of Endemic

888. Sofosbuvir Plus Ribavirin for Treating Egyptian Patients with Hepatitis C Genotype 4

Wahid Doss, Gamal Shiha, Mohamed Hassany, Reham Soliman, Rabab Fouad, Marwa Khairy, Waleed Samir, Radi Hammad, Kathryn Kersey, Deyuan Jiang, Brian Doehle, Steven J. Knox, Benedetta Massetto, John G. McHutchison and Gamal Esmat

Background and Aims: Egypt has the highest prevalence of chronic hepatitis C virus (HCV) infection in the world, and more than 90% of patients are infected with genotype 4 virus. We evaluated the efficacy and safety of the HCV polymerase inhibitor sofosbuvir in combination with ribavirin in HCV genotype 4 patients in Egypt.
Methods: Treatment-naïve or treatment-experienced patients with genotype 4 HCV infection (n = 103) were randomly assigned to receive either 12 or 24 weeks of sofosbuvir 400 mg and ribavirin 1000–1200 mg daily. Randomization was stratified by prior treatment experience and by presence or absence of cirrhosis. The primary endpoint was the percentage of patients with HCV RNA <25 IU/ml 12 weeks after therapy (SVR12).
Results: Among all patients, 52% had received prior HCV treatment and 17% had cirrhosis at baseline. SVR12 rates were 90% (46/51) with 24 weeks and 77% (40/52) with 12 weeks of sofosbuvir and ribavirin therapy. Patients with cirrhosis at baseline had lower rates of SVR12 (63% 12 weeks, 78% 24 weeks) than those without cirrhosis (80% 12 weeks, 93% 24 weeks). The most common adverse events were fatigue, headache, insomnia, and anemia. Two patients experienced serious adverse events (cerebral ischemia, dyspnea). No adverse events resulted in treatment discontinuation.
Conclusion: Sofosbuvir plus ribavirin for 12 or 24 weeks is effective in treating both treatment-naïve and treatment-experienced Egyptian patients with genotype 4 HCV.
Keywords: Antiviral agents; Polymerase inhibitor; Hepatitis C; Sofosbuvir.

889. How to Optimize Hepatitis C Virus Treatment Impact on Life Years Saved in Resource-Constrained Countries

Dorothée Obach, Yazdan Yazdanpanah, Gamal Esmat, Anchalee Avihingsanon, Sahar Dewedar, Nicolas Durier, Alain Attia, Wagida A. Anwar, Anthony Cousien, Pisit Tangkijvanich, Serge Paul Eholié, Wahid Doss, Aya Mostafa, Arnaud Fontanet, Mostafa K. Mohamed and Sylvie Deuffic-Burban

In resource-constrained countries where the prevalence of hepatitis C virus (HCV) disease is usually high, it is important to know which population should be treated first in order to increase treatment effectiveness. The aim was to estimate the effectiveness of different HCV treatment eligibility scenarios in three different countries. Using a Markov model, we estimated the number of life-years saved (LYS) with different treatment eligibility scenarios according to fibrosis stage (F1-F4 or F3-4), compared to base case (F2-F4), at a constant treatment rate, of patients between 18 and 60 years of age, at stages F0/F1 to F4, without liver complications or coinfections, chronically infected by HCV, and treated with pegylated interferon (IFN)/ribavirin or more-efficacious therapies (i.e. IFN free). We conducted the analysis in Egypt (prevalence=14.7%; 45,000 patients treated/year), Thailand (prevalence = 2.2%; 1,000 patients treated/year), and Côte d'Ivoire (prevalence = 3%; 150 patients treated/year). In Egypt, treating F1 patients in addition to ≥F2 patients (SE1 vs. SE0) decreased LYS by 3.9%. Focusing treatment only on F3-F4 patients increased LYS by 6.7% (SE2 vs. SE0). In Thailand and Côte d'Ivoire, focusing treatment only on F3-F4 patients increased LYS by 15.3% and 11.0%, respectively, compared to treating patients ≥F2 (ST0 and SC0, respectively). Treatment only for patients at stages F3-F4 with IFN-free therapies would increase LYS by 16.7% versus SE0 in Egypt, 22.0% versus ST0 in Thailand, and 13.1% versus SC0 in Côte d'Ivoire. In this study, we did not take into account the yearly new infections and the impact of treatment on HCV transmission. *Conclusion*: Our model-based analysis demonstrates that prioritizing treatment in F3-F4 patients in resource-constrained countries is the most effective scenario in terms of LYS, regardless of treatment considered.

890. Comparison of Liver Biopsy and Noninvasive Techniques for Liver Fibrosis Assessment in Patients Infected with HCV-Genotype 4 in Egypt

P. Bonnard, A. Elsharkawy, K. Zalata, E. Delarocque Astagneau, L. Biard, L. Le Fouler, A. B. Hassan, M. Abdel-Hamid, M. El-Daly, M. E. Gamal, M. El Kassas, P. Bedossa, F. Carrat, A. Fontanet and G. Esmat

In Egypt, as elsewhere, liver biopsy (LB) remains the gold standard to assess liver fibrosis in chronic hepatitis C (CHC) and is required to decide whether a treatment should be proposed. Many of its disadvantages have led to develop noninvasive Methods to replace LB. These new Methods should be evaluated in Egypt, where circulating virus genotype 4 (G4), increased body mass index and co-infection with schistosomiasis may interfere with liver fibrosis assessment. Egyptian CHC-infected patients with G4 underwent a LB, an elastometry measurement (Fibroscan(©)), and serum markers (APRI, Fib4 and Fibrotest(©)). Patients had to have a LB =15 mm length or =10 portal tracts with two pathologists blinded readings to be included in the analysis. Patients with hepatitis B virus co-infection were excluded. Three hundred and twelve patients are reported. The performance of each technique for distinguishing F0F1 vs F2F3F4 was compared. The area under receiver operating characteristic curves was 0.70, 0.76, 0.71 and 0.75 for APRI, Fib-4, Fibrotest© and Fibroscan©, respectively (no influence of schistosomiasis was noticed). An algorithm using the Fib4 for identifying patients with F2 stage or more reduced by nearly 90% the number of liver biopsies. Our Results demonstrated that noninvasive techniques were feasible in Egypt, for CHC G4-infected patients. Because of its validity and its easiness to perform, we believe that Fib4 may be used to assess the F2 threshold, which decides whether treatment should be proposed or delayed.
Keywords: Egypt; Hepatic elastography; Hepatitis C virus; Liver biopsy; Liver fibrosis; Serum markers.

891. miR-1275: A Single MicroRNA That Targets the Three IGF2-mRNA-Binding Proteins Hindering Tumor Growth in Hepatocellular Carcinoma

Injie Omar Fawzy, Mohammed Tarif Hamza, Karim Adel Hosny, Gamal Esmat, Hend Mohamed El Tayebi and Ahmed Ihab Abdelaziz

This study aimed to identify a single miRNA or miR (microRNA) which regulates the three insulin-like growth factor-2-mRNA-binding proteins (IGF2BP1, 2 and 3). Bioinformatics predicted miR-1275 to simultaneously target the three IGF2BPs, and screening revealed miR-1275 to be underexpressed in hepatocellular carcinoma (HCC) tissues. Transfection of HuH-7 cells with miR-1275 suppressed IGF2BPs expression and all three IGF2BPs were confirmed as targets of miR-1275. Ectopic expression of miR-1275 and knockdown of IGF2BPs inhibited malignant cell behaviors, and also reduced IGF1R protein and mRNA. Finally IGF1R was validated as a direct target of miR-1275. These findings indicate that the tumor-suppressor miR-1275 can control HCC tumor growth partially through simultaneously regulating the oncogenic IGF2BPs and IGF1R.

Keywords: Hepatocellular carcinoma; Insulin-like growth factor 1 receptor (IGF1R); Insulin-like growth factor-2-mrna-binding protein (IGF2BP or IMP); Posttranscriptional regulation; Mir-1275; mirna or mir.

892. Epigenetic Harnessing of HCV Via Modulating the Lipid Droplet-Protein, TIP47, in HCV Cell Models

Nada M. El-Ekiaby, Radwa Y. Mekky, Shereen A. El Sobky, Noha M. Elemam, Mohammed El-Sayed, Gamal Esmat and Ahmed I. Abdelaziz

This study aimed at identifying potential microRNAs that modulate hepatic lipid droplets (LD) through targeting the Tail interacting protein of 47 kDa (TIP47) in HCV infection. Bioinformatics analysis revealed that miR-148a and miR-30a potentially target TIP47. Expression profiling showed that both microRNAs were downregulated, while TIP47 was upregulated in liver biopsies of HCV-infected patients. Forcing the expression of both microRNAs in JFH-I infected, oleic acid-treated Huh7 cells, significantly suppressed TIP47 expression and reduced cellular LDs with marked decrease in viral RNA. This study shows that miR-148a and miR-30a, regulate TIP47 expression and LDs in HCV infected cells.

Keywords: miR-148a; miR-30a; Tail interacting protein of 47kDa; Lipid droplets; HCV.

893. New Era for Management of Chronic Hepatitis C Virus Using Direct Antiviral Agents: A Review

Tamer Elbaz, Mohamed El-Kassas and Gamal Esmat

The pegylated interferon regimen has long been the lone effective management of chronic hepatitis C with modest response. The first appearance of protease inhibitors included boceprevir and telaprevir. However, their efficacy was limited to genotype 1. Recently, direct antiviral agents opened the gate for a real effective management of HCV, certainly after FDA approval of some compounds that further paved the way for the appearance of enormous potent direct antiviral agents that may achieve successful eradication of HCV

Keywords: Hcv; Direct antiviral agents (DAA); Protease inhibitors; Polymerase inhibitors.

894. Value of Egy-score in Diagnosis of Significant, Advanced Hepatic Fibrosis and Cirrhosis Compared to Aspartate Aminotransferase-to-platelet Ratio Index, Fib-4 and Forns'Index in Chronic Hepatitis C Virus

Mohamed Alboraie, Marwa Khairy, Marwa Elsharkawy, Noha Asem, Aisha Elsharkawy and Gamal Esmat

Aim: Serum markers and developed scores are of rising importance in non-invasive diagnosis of hepatic fibrosis. Aspartate aminotransferase-to-platelet ratio index (APRI), FIB-4 and Forns' index are validated scores used for diagnosis of liver fibrosis. The Egy-Score is a newly developed score for detection of hepatic fibrosis with promising results.We aimed to assess the accuracy of the Egy-Score in the diagnosis of significant fibrosis, advanced fibrosis and cirrhosis compared to APRI, FIB-4 and Forns' in chronic hepatitis C virus (HCV) patients.

Methods: A retrospective study including 100 chronic hepatitis C naïve Egyptian patients was performed. Patients were classified according to stages of fibrosis into three groups: significant fibrosis ($\geq$ F2), advanced fibrosis ($\geq$ F3) and cirrhosis (F4). Egy-Score, APRI, FIB-4 and Forns' index were calculated. Regression analysis and receiver–operator curves were plotted to assess the sensitivity, specificity and predictive values for the significant scores with the best cut-off for diagnosis.

Results: An Egy-Score of 3.28 or more was superior to APRI, FIB-4 and Forns' index for detecting advanced fibrosis with a sensitivity of 91% and specificity of 78%. An Egy-Score of 3.67 or more was superior to APRI, FIB-4 and Forns' index for detecting cirrhosis with a sensitivity of 82% and specificity of 87%. Forns' index was superior to Egy-Score, FIB-4 and APRI for detecting significant fibrosis.

Conclusion: The Egy-Score is a promising, accurate, easily calculated, cost-effective score in the prediction of hepatic fibrosis in chronic HCV patients with superiority over APRI, FIB-4 and Forns' index in advanced hepatic fibrosis and cirrhosis.

Keywords: Aspartate aminotransferase-to-platelet ratio index; Chronic hepatitis C virus; Egy-score; fib-4; forns'; Hepatic fibrosis.

895. Interferon-γ and Interleukin-10 Gene Polymorphisms are Not Predictors of Chronic Hepatitis C (Genotype-4) Disease Progression

Nermine Ahmed Bahgat, Manal Mohamed Kamal, Ashraf Omar Abdelaziz, Mohamed Ahmed Mohye, Hend Ibrahim Shousha, Mae Mohamed ahmed,Tamer Mahmoud Elbaz and Mohamed Mahmoud Nabil

Medicine Sector

Immunoregulatory cytokines have an influence on hepatitis C virus (HCV) infection outcome. This study aimed to determine whether single nucleotide polymorphisms (SNP) in IFN-γ and IL-10 genes are associated with susceptibility and/or are markers of prognosis regarding chronic hepatitis C outcomes. IFNγ (+874T/A) and IL-10 (-1082G/A) genotypes were determined in 75 HCV genotype 4 patients with different disease severities (chronic hepatitis, n=25, liver cirrhosis and hepatocellular carcinoma (HCC) on top of liver cirrhosis, n=50) and 25 healthy participants using allele-specific polymerase chain reaction. No statistical differences in allele or genotype distributions of IFNγ and IL-10 genes were detected between patients and controls or between patientgroups. No significant difference in the frequency of IL-10 SNP at position -1082 or IFN-γ at position +874T/A was found between chronic HCV genotype 4 and with progression of disease severity in liver cirrhosis or HCC. In Conclusion; interferon-γ and interleukin-10 gene polymorphisms are not predictors of disease progression in patients with chronic hepatitis C (Genotype-4).

Keywords: Chronic hepatitis C; Single nucleotide polymorphism; IFN-γ; IL-10; HCV genotype 4.

896. Application of Data Mining Techniques to Explore Predictors of HCC in Egyptian Patients with HCV-related Chronic Liver Disease

Dalia Abd El Hamid Omran, AbuBakr Hussein Awad, Mahasen Abd El Rahman Mabrouk, Ahmad Fouad Soliman and Ashraf Omar Abdel Aziz

Background: Hepatocellular carcinoma (HCC) is the second most common malignancy in Egypt. Data mining is a method of predictive analysis which can explore tremendous volumes of information to discover hidden patterns and relationships. Our aim here was to develop a non-invasive algorithm for prediction of HCC. Such an algorithm should be economical, reliable, easy to apply and acceptable by domain experts.
Methods: This cross-sectional study enrolled 315 patients with hepatitis C virus (HCV) related chronic liver disease (CLD); 135 HCC, 116 cirrhotic patients without HCC and 64 patients with chronic hepatitis C. Using data mining analysis, we constructed a decision tree learning algorithm to predict HCC.
Results: The decision tree algorithm was able to predict HCC with recall (sensitivity) of 83.5% and precession (specificity) of 83.3% using only routine data. The correctly classified instances were 259 (82.2%), and the incorrectly classified instances were 56 (17.8%). Out of 29 attributes, serum alpha fetoprotein (AFP), with an optimal cutoff value of =50.3 ng/ml was selected as the best predictor of HCC. To a lesser extent, male sex, presence of cirrhosis, AST>64U/L, and ascites were variables associated with HCC.
Conclusion: Data mining analysis allows discovery of hidden patterns and enables the development of models to predict HCC, utilizing routine data as an alternative to CT and liver biopsy. This study has highlighted a new cutoff for AFP (=50.3 ng/ml). Presence of a score of >2 risk variables (out of 5) can successfully predict HCC with a sensitivity of 96% and specificity of 82%.
Keywords: HCC; HCV-related chronic liver disease; Data mining; Decision tree; Prediction; AFP.

897. Functional and Morphological Myocardial Changes in Hepatitis C Virus Patients with End-Stage Liver Disease

Dalia A. Omran, Noha Hosam E.L. Din Behairy, Khaled Serag Zakaria, Mohamed Mahmoud Nabil and Karim Said

Background and Objectives: Cardiovascular complications are common in liver transplant recipient. This study aims to evaluate functionaland morphological myocardial changes in hepatitis C virus (HCV) patients with end-stage liver disease (ESLD) by cardiac magnetic resonance (CMR).
Methods: This cross-sectional study included 84 patients with HCV-related ESLD. They were subjected to 2D-echocardiography and CMR. The presence, distribution, and percentage of delayed myocardial enhancement (DME) were estimated.
Results: The mean Model for End-Stage Liver Disease score was 21.5 ± 6.3. In CMR, all patients showed good global left ventricular (LV) systolic function (mean ejection fraction = 66.5 ± 8.6%; range: 55-80) with normal wall thickness and motion. Left ventricle was mildly dilated in 25 patients(30%). Grade I and grade II diastolic dysfunction was detected in 81 patients (96.4%) with dilated left atrium in 25 patients (30%). Variable degrees of DME were detected in 70 patients (83.3%) with mean percentage of DME (%DME) being 19.5 ± 16% (range: 4-52). A significant negative correlation was found between %DME and LV ejection fraction (r = -0.7; p < 0.001), cardiac output (r = -0.5; p = 0.013), cardiac index (r = -0.5; p = 0.02), and serum albumin level (r = -0.5; p = 0.01). The %DME =19% was associated with 85.7% sensitivity and 85.7% specificity for detection of LV ejection fraction <60% as assessed by echocardiography (area under curve = 0.89; p = 0.001).
Conclusion: DME with CMR is a common finding among patients with HCV-related ESLD. The extent of DME is significantly associated with global LV systolic function.
Keywords: Cardiomyopathies; Echocardiography; End-stage liver disease; Magnetic resonance imaging.

898. Microwave Ablation Versus Transarterial Chemoembolization in Large Hepatocellular Carcinoma: Prospective Analysis

Abdelaziz AO, Nabeel MM, Elbaz TM, Shousha HI, Hassan EM, Mahmoud SH, Rashed NA, Ibrahim MM and Abdelmaksoud AH.

Objective Limited therapies are offered for large hepatocellular carcinoma (HCC). It carries dismal prognosis and efforts tried changing its management from a palliative to a curative mode. Transarterial chemoembolization (TACE) is a palliative procedure that may have survival benefit if compared to non-management of large lesions. Microwave ablation (MWA) has emerged as a relatively new technique with promise of larger and faster ablation. We aim to evaluate the efficacy and safety of percutaneous MWA versus TACE for large tumors (5-7 cm) and to assess their effects on local tumor progression and survival.
Patients and Methods: Sixty-four patients with large lesions are managed in our multidisciplinary HCC clinic and were divided into two groups treated either by MWA or TACE. Complete

response rate, local recurrence, de novo lesions, and overall survival analysis are compared between both procedures.

Results: Both groups were comparable as regards the demographic and ultrasonographic features. MWA showed higher rates of complete ablation (75%) with fewer sessions, lower incidence of tumor recurrence (p = 0.02), development of de novo lesions (p = 0.03), occurrence of post-treatment ascites (p = 0.003), and higher survival rates (p = 0.04). The mean survival of the microwave group was 21.7 months with actuarial probability of survival at 12 and 18 months 78.2% and 68.4%, respectively. The mean survival of the TACE group was 13.7 months with actuarial probability of survival at 12 and 18 months being 52.4% and 28.6%, respectively.

Conclusion: MWA showed better Results than TACE in the management of large HCC lesions.

Keywords: Hepatocellular carcinoma; Microwave ablation; Survival; Transarterial chemoembolization.

899. Hepatitis C Virus Acquisition Among Egyptians: Analysis of A 10-Year Surveillance of Acute Hepatitis C

Amira Mohsen, Adeline Bernier, Lenaig LeFouler, Elisabeth Delarocque-Astagneau, Mai El-Daly, Sherif El-Kafrawy, Salwa El-Mango, Mohamed Abdel-Hamid, Mohsen Gadallah, Gamal Esmat, Mostafa K. Mohamed and Arnaud Fontanet

Objective To identify current risk factors for hepatitis C virus (HCV) acquisition among Egyptians.

Methods: Patients with acute HCV were identified through a surveillance system of acute hepatitis in four fever hospitals in Egypt between 2002 and 2012. Case-control analysis was conducted, cases being incident acute symptomatic HCV and controls being acute hepatitis A identified at the same hospitals. The questionnaire covered iatrogenic, community and household exposures to HCV in the 1-6 months prior to onset of symptoms. Multivariate models were built to identify risk factors associated with HCV acquisition among non-drug users and drug users separately.

Results: Among non-drug users, hospital admission was independently associated with acute HCV infection (OR = 4.2, 95% CI = 1.7-10.5). Several iatrogenic procedures, for example admission in a surgery unit, sutures, IV injections and IV infusions, highly correlated with hospital admission, were also associated with acute HCV infection and could have been used in the final model instead of hospital admission. Among drug users, identified risk factors were multiple sexual relations (OR = 4.0, 95% CI = 1.1-14.7), intravenous drug use (OR = 3.9, 95% CI = 1.2-13.0) and shaving at the barbershops (OR = 8.7, 95% CI = 2.4-31.4). Illiteracy and marriage were significant risk factors in both groups.

Conclusion: Invasive medical procedures are still a major risk for acquiring new HCV infections in Egypt, as is illicit drug use in spreading HCV infection.

Keywords: Egipto; Egypt; Egypte; Acute hepatitis C; Epidemiology; Epidemiología; facteurs de risque; Factores de riesgo; Hepatitis C aguda; Hépatite C aiguë; Risk factors; Épidémiologie.

900. Repressing PU.1 By miR-29a* in NK Cells of HCV Patients, Diminishes its Cytolytic Effect on HCV Infected Cell Models

Noha Mousaad Elemam, Radwa Yehia Mekky, Nada Magdy El-Ekiaby, Shereen Ahmed El Sobky, Mohammad Ahmad Mohey El Din, Gamal Esmat and Ahmed Ihab Abdelaziz

Objectives: Natural killer cells are immune safeguards against HCV infection. PU.1 is a pivotal transcription factor in the development of NK cells. This study aimed at studying the regulatory effect of miRNAs on both development and function of NK cells isolated from HCV patients.

Methods: NK cells were isolated from 17 chronic HCV patients and 12 healthy controls; after which miRNA and mRNA were quantified using qRT-PCR. Manipulating miRNA expression using mimics and antagomirs, was performed followed by investigating downstream targets as well as viral abundance.

Results: PU.1 expression levels were upregulated in NK cells of HCV patients. In silico analysis revealed PU.1 to be a potential downstream target of miR-29a(*), where miR-29a(*) overexpression in NK cells caused a significant downregulation in PU.1 mRNA. Forcing miR-29a(*) caused a downregulation of the cytotoxicity determinant NK activating receptor (NKG2D) via upregulation of miR-155. Moreover, perforin-1 mRNA was found to be downregulated upon forcing the expression of miR-29a(*) in NK cells of HCV patients. This decrease in NK cytolytic function was accompanied by an 80% viral load increase in cocultured HCVcc cell models.

Conclusions: This study showed that HCV infection might abrogate NK cytotoxic potential through altering PU.1, NKG2D receptor and perforin molecules.

Keywords: Hcv; Natural killer cells; Pu.1; Mirnas

901. Serum Soluble CD14 in Egyptian Patients with Chronic Hepatitis C: Its Relationship to Disease Progression and Response to Treatment

Eman Medhat, Hosny Salama, Hanan Fouad, Hanan Abd El Haleem, Mohamad Said, Saeed M. El-Nahaas and Dalia Omran

Hepatitis C virus (HCV) is a major public health problem. Soluble CD14 (sCD14) level was shown to be associated with HCV infection. In this study, we aimed to investigate the relationship between sCD14 concentration and disease progression, as well as the response to pegylated interferon/ribavirin (peg-IFN/RBV) therapy in Egyptian patients with chronic hepatitis C (CHC). The ELISA technique was used to test 80 patients with CHC and 20 healthy control persons for serum levels of sCD14 (pretreatment and after 12 weeks of treatment). CHC patients were 65 males and 15 females. Normal healthy controls included 20 age- and sexmatched volunteers. The mean age of the CHC patients was 39.94 years, while that of the controls was 39.2 years The serum sCD14 level was significantly higher in chronic HCV-infected patients (3.6 – 0.18 mg/mL) compared to healthy control subjects (3.1 – 0.18 mg/mL). The serum sCD14 level was significantly directly correlated with the hepatic fibrosis score (r = 0.24, P = 0.03), histological activity index (r = 0.26, P = 0.02), and serum aminotransferases [r = 0.28,

P = 0.005 for alanine aminotransferase (ALT) and r = 0.30, P = 0.003 for aspartate aminotransferase (AST)]. The pretreatment sCD14 level was not significantly correlated to the treatment response, but it increased after 12 weeks of peg-IFN/RBV therapy and values were significantly higher in nonresponders (P = 0.02). The pretreatment sCD14 level cannot predict the treatment response in chronic HCV patients receiving peg-IFN/RBV therapy. However, the serum sCD14 level after 12 weeks of treatment can serve as a negative predictor of treatment response.
Keywords: Soluble Cd14; Hepatis C; Egyptian patients.

902. Impact of Vitamin D Supplementation on Sustained Virological Response in Chronic Hepatitis C Genotype 4 Patients Treated by Pegylated Interferon/ribavirin

Gamal Esmat, Maissa El Raziky, Aisha Elsharkawy, Dina Sabry, Mohamed Hassany, Amal Ahmed, Noha Assem, Mohamad El Kassas and Wahid Doss

The current standard of care therapy (SOC) for chronic HCV is pegylated interferon/ribavirin (Peg-IFN/RBV). Many reports showed the possible role of vitamin D supplementation in augmenting the response to SOC. The aim of this study was to assess the role of vitamin D supplementation on the response to treatment in chronic HCV genotype 4 patients. One hundred and one chronic HCV patients were classified into two groups (Group 1): 51 patients received the SOC therapy consisting of Peg-interferon alfa-2b plus ribavirin, (Group 2): 50 patients received the SOC therapy+vitamin D3 (Cholecalciferol) in a dose of 15,000IU/week during the treatment course. Vitamin D deficiency was found in 95% of patients. No correlation was found between vitamin D levels and stage of fibrosis in the whole population. Vitamin D supplementation had no positive impact on treatment outcome where sustained virological response (SVR) was achieved in 51.2% in group 2 and 71.4% in group 1 by per-protocol analysis and in 44% in group 2 and in 68.6% in group 1 by intention to treat analysis (P value 0.22 and 0.220 respectively). Despite its role in other genotypes, vitamin D supplementation has no significant impact on SVR in HCV Genotype 4 patient. No correlation was found between vitamin D levels and stage of liver fibrosis.
Keywords: HCV; Vit D- SVR- Liver Fibrosis

903. IP-10 Serum Level in Chronic Hepatitis C Virus Patients: Relation to Fibrosis and Response to Combined Interferon/ribavirin Therapy

Maissa El Raziky, Aisha Elsharkawy, Salma E. Said, Sahar Abdelatty, Wafaa El Akel, Omnia Tantawy, Hadeel Gamal Eldeen and Mahasen Mabrouk

Despite the appearance of the direct acting antiviral drugs, pegylated interferon/ribavirin (PEG-IFN/RBV) still has a place in the standard of care (SOC) therapy for chronic HCV4. Studies were conducted to find an accurate prediction in response to SOC therapy. Pretreatment serum interferon-g-inducible protein-10 (IP-10) is an independent predictive factor of sustained virological response (SVR) in HCV1-infected patients. To assess whether the pretreatment serum level of IP-10 influences hepatic fibrosis and PEG-IFN/RBV therapy response, a study was conducted on 88 chronic Hepatitis C virus (HCV) patients who received PEG-IFN/RBV. Patients were subjected to a pretreatment routine laboratory evaluation, liver biopsy, and serum IP-10 assessment. They were followed up for 6 months after cessation of therapy (week 72). Patients were classified into 3 groups according to their response; nonresponders, relapsers, or sustained virological responders. The relation of pretreatment IP-10 with fibrosis and response was assessed. The studied groups were matched regarding their demographic data. There was no statistically significant association between the pretreatment IP-10 level and fibrosis (P = 0.86) and no relation to response was found at week 12, 24, 48, and 72 (P = 0.58, 0.8, 0.47, and 0.43, respectively). Pretreatment IP-10 could not predict either fibrosis or response to PEG-IFN/RIB therapy in chronic HCV Egyptian patients.

904. Value of Microwave Ablation in Treatment of Large Lesions of Hepatocellular Carcinoma

Eman Medhat, Ashraf Abdel Aziz, Mohammed Nabeel, Tamer Elbaz, Zeinab Zakaria, Hend Shousha, Ayman Amer, Waleed Fouad Fathalah, Rabab Maher and Shereif Musa

Objective Thermal ablative therapies continue to acquire to be Favored as a safe and treatment for patients with non resectable hepatocellular carcinoma (HCC). Percutaneous microwave ablative therapy which is a relatively new technique has the advantage in providing faster ablation of larger tumors. This study aimed to evaluate microwave ablation in treatment of large HCC (5-7cm) and to assess its effect on local tumor progression, prognostic outcome and patient's survival.
Methods: In all, 26 patients with large HCC lesions (5-7cm) were managed in the multidisciplinary clinic of Kasr Al Ainy University hospital using microwave ablation. The treatment was performed with the patient under conscious sedation and analgesia and ultrasonography guided using HS AMICA microwave machine, operating at frequency of 2450 MHz and a power up to 100 W. Multiple needle insertions in one or two sessions according to the size of the lesion. Complete ablation rate, local tumor progression and patients, overall survival were analyzed, and the efficacy and safety of MWA were evaluated.
Results: Complete ablation was achieved in 19/ 26 (73.1%) of the lesions. Local tumor progression was recorded in five treated lesions (19.2%). Distant tumor progression within the liver was recorded in six patients (23.1%), with a mean survival of 21.5 months. No procedure related major complications or deaths were observed.
Conclusion: Percutaneous microwave ablation by percutaneous approach is safe and effective in the treatment of large HCC tumors. Patients, survival and local tumor control were acceptable.
Keywords: Hepatocellular (HCC) Carcinoma; Percutaneous microwave ablation (MWA); Survival; Multidisciplinary HCC clinic.

905. Evaluation of microRNAs-29A, 92A and 145 in Colorectal Carcinoma as Candidate Diagnostic Markers: an Egyptian Pilot Study

Iman Ramzy, Maha Hasaballah, Raghda Marzaban, Olfat Shaker and Zienab A. Soliman

Background: Colorectal cancer (CRC) is one of the most common malignant neoplasms in Egypt, and interestingly in young age. Adenomatous polyps and inflammatory bowel diseases (IBD) are considered the commonest pre-malignant lesions for CRC. A possible diagnostic role for different microRNAs on CRC has been suggested by numerous studies. Aim of work: to assess the serum expression of 3 microRNA markers (miR-29a, miR-92a and miR-145) in pre-malignant & malignant colorectal lesions.
Patients and Methods: The 60 patients studied were divided into 4groups; CRC group (25patients), IBD group (11patients), adenomatous polyps group (14 patients) and control group (10 patients). The serum expression of the 3 markers (miR-29a, miR-92a and miR-145) has been assessed by RT-PCR.
Results: All CRC were sporadic cases. Significant down regulation of miR-145 in CRC group was reported at all levels i.e when compared to normal, among the 3 studied groups, and when compared between CRC and non CRC groups. Significant up regulation of miR-29a in CRC was reported when compared to normal, but no significant difference existed either among the 3 studied groups or between CRC and the other 2 groups. All 3 miRNAs studied were positively inter-correlated.
Conclusions: miR-145 may be considered a promising non invasive reliable diagnostic marker in CRC. Extended studies are needed to ascertain the diagnostic role of miRNAs in CRC.
Keywords: Colorectal carcinoma (CRC); Microrna (MIR-); Adenomatous polyps; Inflammatory bowel disease (IBD)

906. Transcriptional Activation of the IGF-II/IGF-1R Axis and Inhibition of IGFBP-3 by miR-155 in Hepatocellular Carcinoma

Hend M. El Tayebi, Amr A. Waly, Reem A. Assal, Karim A. Hosny, Gamal Esmat and Ahmed I. Abdelaziz

Hepatocellular carcinoma (HCC) is characterized by the aberrant expression of a number of genes that govern crucial signaling pathways. The insulin-like growth factor (IGF) axis is important in this context, and the precise regulation of expression of members of this axis is known to be lost in HCC. miR-155 is a well-established oncogene in numerous types of cancer. However, to the best of our knowledge, its effect on the regulation of the IGF axis has not been investigated to date. The present study aimed to elucidate the interactions between miR-155 and key components of the IGF axis, in addition to examining its effect on HCC development. Reverse transcription-quantitative polymerase chain reaction was used to measure the expression of miR-155 in HCC and cirrhotic tissues, in addition to HCC cell lines. Furthermore, the effect of the induction of miR-155 expression on the expression of three members of the IGF axis [IGF II, IGF type-1 receptor (IGF-1R) and IGF-binding protein 3 (IGFBP-3)], was analyzed. Finally, the effect of miR-155 on HCC cell proliferation, migration and clonogenicity was also examined. Quantification of the expression of miR-155 demonstrated that it is upregulated in HCC. Induction of the expression of miR-155 in HCC cell lines led to the upregulation of IGF-II and IGF-IR, and the downregulation of IGFBP-3. In addition, the proliferation, migration and clonogenicity of HCC was increased following induction of miR-155 expression. miR-155 is an oncomiR, which upregulates the oncogenes, IGF-II and IGF-IR, and downregulates the tumor suppressor, IGFBP-3, thereby resulting in increased HCC cell carcinogenicity. Therefore, miR-155 may be a therapeutic target in HCC.
Keywords: Hepatocellular carcinoma; Insulin-like growth factor Ii; Insulin-like growth factor type-1 receptor; Insulin-like growth factor-binding protein 3; Microrna-155.

907. Different Score Systems to Predict Mortality in Living Donor Liver Transplantation: Which is the Winner? the Experience of an Egyptian Center for Living Donor Liver Transplantation

M. El Amir, H. Gamal Eldeen, S. Mogawer, G. Esmat, M. El-Shazly, N. El-Garem, M.S. Abdelaziz, A. Salah and A. Hosny

Introduction: Many scoring systems have been proposed to predict the outcome of deceased donor liver transplantation. However, their impact on the outcome in living donor liver transplantation (LDLT) has not yet been elucidated. This study sought to assess performance of preoperative Model for End-Stage Liver Disease (MELD) score in predicting postoperative mortality in LDLT and to compare it with other scores: MELDNa, United Kingdom End-Stage Liver Disease (UKELD), MELD to serum sodium ratio (MESO), updated MELD, donor age-MELD (D-MELD) and integrated MELD (iMELD).
Methods: We retrospectively analyzed data from 86 adult Egyptian patients who underwent LDLT in a single center. Preoperative MELD, MELDNa, MESO, UKELD, updated MELD, D-MELD, and iMELD were calculated. Receiver-operator characteristic (ROC) curves and area under the curve (AUC) were used to assess the performance of MELD and other scores in predicting postoperative mortality at 3 months (early) and 12 months.
Results: Among the 86 patients, mean age 48 ± 7 years, 76 (88%) were of male sex and 27 (31.4%) had died. Preoperative MELD failed to predict early mortality (AUC = 0.63; P = .066). Comparing preoperative MELD with other scores, all other scores had better predictive ability (P < .05), with D-MELD on the top of the list (AUC = 0.68, P = .016), followed closely by UKELD (AUC = 0.67, P = .025). After that were iMELD, MESO, and MELDNa with the same predictive performance (AUC = 0.65; P < .05); updated MELD had the lowest prediction (AUC = 0.640; P = .04). Moreover, all scores failed to predict mortality at 12 months (P > .05).
Conclusions: Preoperative MELD failed to predict either early or 1-year mortality after LDLT. D-MELD, UKELD, MELDNa, iMELD, and MESO could be used as better predictors of early mortality than MELD; however, we need to develop an effective score system to predict mortality after LDLT.
Keywords: Prediction; Ldlt; Score systems; Mortality.

Medicine Sector

908. Evaluation of Fluvastatin in Combination with the Standard of Care Therapy (PEG-IFN/Ribavirin) in Egyptian Patients with Hepatitis C Virus

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Background/Aims: Cholesterol biosynthesis suppresses the replication of HCV-1b replicons, thus influencing hepatitis C virus (HCV) natural history. This study aimed at comparing the efficacy and safety of fluvastatin (FLV) as an adjuvant therapy to the standard of care (SOC) therapy, i.e., pegylated interferon (PEG-IFN) and ribavirin, for the treatment of HCV patients.
Materials and Methods: Sixty HCV patients were enrolled and allocated to either group I, who received the triple therapy (fluvastatin + SOC), or group II, who received SOC; the duration for both treatments was 48 weeks. All patients were subjected to pretreatment liver biopsy and monthly biochemical tests (liver profile, CBC), and quantitative HCV-RNA test was performed at weeks 0, 4, 12, 48, and 72.
Results: All virological responses were higher in group I than in group II, with no statistical difference. Group I showed no manifestations of hepatotoxicity.
Conclusion: Fluvastatin yielded a borderline, significantly higher complete early virological response than SOC; therefore, it is a safe adjuvant to the SOC therapy.
Keywords: Hepatitis C virus; Standard of care; Fluvastatin; Rapid virological response; Early virological response; Sustained virological response.

909. Diagnostic Value of Vascular Endothelial Growth Factor and Interleukin-17 in Association with Molecular Diagnosis of Wuchereria Bancrofti Infection

Dalia Abdelhamid Omran, Mayssa Mohamed Zaki, Salwa Fayez Hasan and Hend Ibrahim Shousha

Objective To explore effective diagnosis of Wuchereria bancrofti through DNA-based techniques followed by assessment of vascular endothelial growth factor concentration (VEGF-C) and interleukin 17 (IL-17) as indicators for lymphatic endothelial cell activation, proliferation and massive tissue reaction that may be a good indicator for ongoing lymphatic filariasis.
Methods: Blood samples were collected from 38 patients: 23 males (60.5%) and 15 females (39.5%) with filariasis and from controls (60 from a non-endemic and 22 from endemic areas). PCR was used to prove infection. A specific and sensitive ELISA was used to determine serum IL-17 and VEGF-C.
Results: A total of 28 patients (46.7%) were positive by PCR, while 10 patients (16.7%) were negative by PCR. Serum level of vascular endothelial growth factor was significantly high in acute cases [(2 147.00 ± 556.00) pg/mL] and in cases of early elephantiasis [(1 950.00 ± 638.00) pg/mL] and lowest in cases of late elephantiasis, endemic and non endemic controls [(1 238.00 ± 443.00), (807.11 ± 6.20) and (857.00 ± 91.50) pg/mL respectively]. Serum IL-17 was found to be significantly high in acute cases, early elephantiasis and late elephantiasis cases [(8

601 ± 1131), (7 867 ± 473) and (6 593 ± 378) pg/mL respectively] when compared to endemic controls [(3 194 ± 1 500 pg/mL)] and non endemic controls [(3 416 ± 1 101) pg/mL].
Conclusions: VEGF-C and its inducing factor IL-17 are expected to gain more importance in filariasis. Targeting such factors might ameliorate the pathology in chronic filariasis
Keywords: Lymphatic Filariasis Dna-Based Diagnosis Vascular Endothelial Growth Factor Interleukin-17.

910. Epstein–Barr virus and Interleukin-28B polymorphism in the prediction of response to interferon therapy in hepatitis C patients

Abdel-Rahman N. Zekri, Dina Abdullah, Ahmed Osman, Mahmoud N. El-Rouby, Naglaa Zayed, Gamal Esmat, Wafaa Elakel and Hanan Abdel Hafez

Background and study aims: In chronic hepatitis C virus (HCV), viral and host factors are known to be predictors for anti-viral therapy. IL-28B genotype strongly influences treatment outcome, while Epstein–Barr virus (EBV) co-infection could accelerate the course of chronic HCV infection. This study was conducted to assess whether EBV co-infection adds to the predictive value of IL-28B.
Patients and methods: A total of 105 patients with chronic HCV were classified according to their response to treatment into two groups: 38 sustained virological responders (SVRs) and 67 nonresponders (NRs). Collected sera at baseline and follow-up (FUP) were used for assessing EBV antibodies by enzymelinked immunosorbent assay (ELISA) and the expression of EBV genes (BNLF-1, BZLF-1, and EBER-2) by polymerase chain reaction (PCR). Collected peripheral blood was used for detecting IL-28B rs.12979860 single-nucleotide polymorphism.
Results: Regarding IL-28B genotype frequencies, a significant difference (p = 0.003) was observed between SVRs (C/C = 51.4%, C/T = 48.6%, T/T = 0%) and NRs (C/C = 25%, C/T = 55%, T/T = 20%).
On assessing EBV infection at baseline and FUP, it was found that 61% and 55% were positive, respectively, with no significant difference between SVRs and NRs. As for anti-viral capsid antigen (VCA) antibodies, the NRs had significantly higher baseline anti-VCA immunoglobulin M (IgM) levels than SVRs (p = 0.01). While FUP anti-Epstein–Barr nuclear antigen-1 (EBNA-1) IgG reported a significant decline within SVR patients (p = 0.02), neither baseline nor FUP anti-VCA IgG levels showed a statistically significant viral response. Finally, on comparing EBV markers with CC versus CT and TT genotypes, it was found that FUP anti- VCA IgG levels were significantly increased in CC genotype (p = 0.003).
Conclusion: Interleukin-28B polymorphism could be a possible predictor of response to pegylated interferon/ribavirin therapy (PEG-IFN/RBV). Furthermore, co-infection with EBV did not affect the response to IFN-based therapy in HCV-infected patients.
Keywords: Epstein-barr virus; Interleukin-28B; HCV; SVR; NR; Co-infection.

Dept. of Forensic & Toxicology

911. Paraoxonase 1 and Cytochrome P450 Polymorphisms in Susceptibility to Acute Organophosphorus Poisoning in Egyptians

Abeer Ahmed Zayed, Asmaa Ismail Ahmed, Amr Mohamed Tawfik Khattab, Alaa Abde Hamid Mekdad and Aly Gamaleldin Abdel Aal

Background: Organophosphates are the basis of many insecticides, herbicides, and nerve agents. They were listed as highly acutely toxic agents. Findings in knockout mice suggest that paraoxonase 1 may modulate the toxicity resulting from exposure to organophosphorus compounds. In human, there is no enough data about genetic modulation of acute organophosphorus intoxication. CYP2D6 is involved in the metabolism of about 30% of xenobiotics. Prompt accurate management of OP acute intoxication can promote patient's survival.
Design and Methods: Forty acute organophosphorus intoxicated patients were divided according to presence of clinical toxicity manifestations and serum level of pseudo-cholinesterase into two groups of acute symptomatic and acute asymptomatic patients. A third group of 29 healthy volunteers served as control. Paraoxonase 1 Q192R and CYP2D6 G1934A polymorphisms, (QQ, QR, and RR for PON1) and (GG, GA, and AA for CYP2D6), were studied using polymerase chain reaction-restriction fragment length polymorphism technique. Serum paraoxonase 1 and pseudo-cholinesterase activities were measured spectrophotometrically.
Results: Serum pseudo-cholinesterase was significantly reduced in both acute intoxication groups compared to the controls (p = 0.000). Paraoxonase 1 was significantly reduced in the symptomatic acute intoxication patients in comparison to the asymptomatic group (p = 0.002). There was a significant increase in paraoxonase 1 192 RR genotype and R allele in the symptomatic patients in comparison to the controls and asymptomatic patients (p = 0.006 and p = 0.01, respectively). For CYP2D6 G1934A genotypes and alleles, no significant difference was found between groups (p = 0.3 and p = 0.18, respectively). However, one case of the two recorded fatalities was for a symptomatic female patient with the only traced AA genotype. The combination of both single nucleotide polymorphisms revealed a significant distribution difference between groups, with QQ + GG genotypes being more represented in the controls, while RR + GA genotypes were exclusively present in the group of symptomatic patients (p = 0.04), none of the participants was found to have RR + AA genotypes. Some nicotinic (fasciculation and weakness), and muscarinic symptoms (bronchospasm, salivation, lacrimation, and diarrhea), increased with high significance in the symptomatic group compared to the asymptomatic one (p < 0.001 for all). Convulsions also showed significant increase (p = 0.02).
Conclusion: Paraoxonase 1 Q192R modulates patient's response, and CYP2D6 may be related to the acute organophosphorus intoxication in the context of other genetic-environmental factors. Paraoxonase 1 enzyme level is related to symptom severity in acute OP poisoning, while pseudo-cholinesterase level indicates exposure to OP rather than severity of clinical manifestations.
Keywords: Paraoxonase1; CYP2D6; Acute organophosphorus intoxication.

Dept. of Histology

912. Intrathecal Transplantation of Autologous Adherent Bone Marrow Cells Induces Functional Neurological Recovery in A Canine Model of Spinal Cord Injury

Hala Gabr, Wael Abo El-kheir, Haithem A. M. A. Farghali, Zeinab M. K. Ismail, Maha B. Zickri, Zeinab M. El Maadawi, Nirmeen A. Kishk and Hatem E. Sabaawy

Spinal cord injury (SCI) Results in demyelination of surviving axons, loss of oligodendrocytes, and impairment of motor and sensory functions. We have developed a clinical strategy of cell therapy for SCI through the use of autologous bone marrow cells for transplantation to augment remyelination and enhance neurological repair. In a preclinical large mammalian model of SCI, experimental dogs were subjected to a clipping contusion of the spinal cord. Two weeks after the injury, GFP-labeled autologous minimally manipulated adherent bone marrow cells (ABMCs) were transplanted intrathecally to investigate the safety and efficacy of autologous ABMC therapy. The effects of ABMC transplantation in dogs with SCI were determined using functional neurological scoring, and the integration of ABMCs into the injured cords was determined using histopathological and immunohistochemical investigations and electron microscopic analyses of sections from control and transplanted spinal cords. Our data demonstrate the presence of GFP-labeled cells in the injured spinal cord for up to 16 weeks after transplantation in the subacute SCI stage. GFP-labeled cells homed to the site of injury and were detected around white matter tracts and surviving axons. ABMC therapy in the canine SCI model enhanced remyelination and augmented neural regeneration, resulting in improved neurological functions. Therefore, autologous ABMC therapy appears to be a safe and promising therapy for spinal cord injuries.
Keywords: Autologous adherent bone marrow-derived cell therapy; Spinal cord injury (SCI); Canine; Intrathecal; Remyelination.

Dept. of Internal Medicine

913. Plasma Adiponectin and Carotid Intima–media Thickness in Non-obese Patients with Type 2 Diabetes

Aasem Saif, Alaa Abdelhamid, Maha Assem and Shrook Mousa

Aim We assessed the correlation between plasma adiponectin levels and carotid intima media thickness (IMT), as a marker of atherosclerosis, in non-obese patients with type 2 diabetes.
Methods The study group included 112 (60 males and 52 females) non-obese Egyptian patients with type 2 diabetes. Fasting plasma adiponectin was measured using ELISA technique. Carotid IMT was assessed using high-resolution color-coded Doppler ultrasonography. Forty age, sex and weight matched normal Egyptian subjects were included in the study as a control group.

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Results A non-significant inverse correlation was found between plasma adiponectin levels and carotid IMT in the study group (p = 0.054). Multiple regression analysis revealed that plasma adiponectin was not a determinant of carotid IMT in the study group (p = 0.061).

Conclusion The inverse relation between plasma adiponectin and carotid IMT in type 2 diabetes could be explained, at least partially, by obesity.

Keywords: Adiponectin, Carotid intima–media thickness; Type 2 diabetes; Atherosclerosis; Doppler ultrasonography.

914. Retinopathy is A Strong Determinant of Atherosclerosis in Type 2 Diabetes: Correlation with Carotid Intima Media Thicknes

Aasem Saif, Sherif Karawya and Alaa Abdelhamid

Endocrine Practice, 21: 226-230 (2015) IF: 2.811

Objective We investigated the correlation between the severity of diabetic retinopathy (DR) and carotid intima media thickness (IMT) as a marker of atherosclerosis in patients with type 2 diabetes.

Methods: The study group consisted of 140 normotensive Egyptian patients (68 males and 72 females) with type 2 diabetes and DR. Carotid IMT was evaluated using high-resolution B-mode ultrasonography. DR was assessed and graded using colored fundus photography and fundus fluorescein angiography, as either nonproliferative DR (NPDR) or proliferative DR (PDR).

Results: Carotid IMT was greater in patients with PDR compared to those with NPDR (1.094 ± 0.142 mm vs. 0.842 ± 0.134 mm; P<.001). Carotid IMT showed positive correlation with diabetes duration (P<.01), systolic blood pressure (P<.001), diastolic blood pressure (P<.01), fasting blood glucose (P<.01), postprandial blood glucose (PPBG) (P<.001), glycated hemoglobin (P<.01), total cholesterol (P<.01), triglycerides (TGs) (P<.001), and DR (P<.0001). No significant difference was found between males and females in any of the studied parameters. Multiple regression analysis revealed that the determinants of carotid IMT in the studied group were age (P<.01), PPBG (P<.01), TGs (P<.001), and DR (P<.0001).

Conclusion: Our study proves that both NPDR and PDR are strong determinants of carotid IMT and atherosclerosis in patients with type 2 diabetes.

Keywords: Diabetic retinopathy; Carotid intima-media thickness; Atherosclerosis; Type 2 diabetes.

915. Low-Density Lipoprotein Receptor Genetic Polymorphism in Chronic Hepatitis C Virus Egyptian Patients Affects Treatment Response

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World Journal of Gastroenterology, 21: 11141-11151 (2015) IF: 2.369

Aim: To correlate a genetic polymorphism of the low-density lipoprotein (LDL) receptor with antiviral responses in Egyptian chronic hepatitis C virus (HCV) patients.

Methods: Our study included 657 HCV-infected patients with genotype 4 who received interferon-based combination therapy.

Patients were divided into two groups based on their response to therapy: 356 were responders, and 301 were non-responders. Patients were compared to 160 healthy controls. All patients and controls underwent a thorough physical examination, measurement of body mass index (BMI) and the following laboratory tests: serum alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase, albumin, total bilirubin, direct bilirubin, prothrombin time, prothrombin concentration, INR, complete blood count, serum creatinine, fasting blood sugar, HCV antibody, and hepatitis B surface antigen. All HCV patients were further subjected to the following laboratory tests: HCV-RNA using quantitative polymerase chain reaction (PCR), antinuclear antibodies, thyroid-stimulating hormone, an LDL receptor (LDLR) genotype study of LDLR exon8c.1171G>A and exon10c.1413G>A using real-time PCR-based assays, abdominal ultrasonography, ultrasonographic-guided liver biopsy, and histopathological examination of liver biopsies. Correlations of LDL receptor polymorphisms with HAI, METAVIR score, presence of steatosis, and BMI were performed in all cases.

Results: There were no statistically significant differences in response rates between the different types of interferon used or LDLR exon10c.1413G>A. However, there was a significant difference in the frequency of the LDL receptor exon8c.1171G>A genotype between cases (AA: 25.9%, GA: 22.2%, GG: 51.9%) and controls (AA: 3.8%, GA: 53.1% and GG: 43.1%) (P < 0.001). There was a statistically significant difference in the frequency of the LDLR exon 8C:1171 G>A polymorphism between responders (AA: 3.6%, GA: 15.2%, GG: 81.2%) and non-responders (AA: 52.2%, GA: 30.6%, GG: 17.2%) (P < 0.001). The G allele of LDL receptor exon8c.1171G>A predominated in cases and controls over the A allele, and a statistically significant association with response to interferon was observed. The frequency of the LDLR exon8c.1171G>A allele in non-responders was: A: 67.4% and G: 32.6 vs A: 11.2% and G: 88.8% in responders (P < 0.001). Therefore, carriers of the A allele exhibited a 16.4 times greater risk for non-response. There was a significant association between LDL receptors exon8 c.1171G>A and HAI (P < 0.011). There was a significant association between LDL receptors exon8c.1171G>A and BMI. The mean BMI level was highest in patients carrying the AA genotype (28.7 ± 4.7 kg/m2) followed by the GA genotype (28.1 ± 4.8 kg/m2). The lowest BMI was the GG genotype (26.6 ± 4.3 kg/m2) (P < 0.001). The only significant associations were found between LDL receptors exon8 c.1171G>A and METAVIR score or steatosis (P < 0.001).

Conclusion: LDL receptor gene polymorphisms play a role in the treatment response of HCV and the modulation of disease progression in Egyptians infected with chronic HCV.

Keywords: Hepatitis C virus; Genetic polymorphisms; Low-density lipoprotein receptor; Egypt; Hepatitis C virus response to treatment.

916. Evidence of Association of Interleukin-23 Receptor Gene Polymorphisms with Egyptian Rheumatoid Arthritis Patients

Gehan Hamdy, Hanan Darweesh, Enas A. Khattab, Samar Fawzy, Esmat Fawzy and Marwa Sheta

Human Immunology, 76: 417-420 (2015) IF: 2.138

Background: The identification of additional genetic risk factor is an on-going process that will aid in the understanding of rheumatoid arthritis (RA) aetiology. A genome-wide association

scan in Crohn's (CD) disease highlighted the interleukin-23 receptor (IL23R) gene as a susceptibility factor. Since the IL-23/IL-17 pathway is known to associate with other autoimmune disease, including rheumatoid arthritis and systemic sclerosis, we hypothesised that IL23R could be a shared susceptibility gene. The rare allele of IL23R single nucleotide polymorphism (SNP) rs11209026 (Arg381Gln) confers strong protection against CD. Our aim was to analyse IL23R SNP (rs11209026, rs2201841, and rs10889677) and to detect its association with RA in Egyptian patients.

Methods: A group of Egyptian patients with RA (n = 120) and apparently healthy persons as controls (n = 120) was genotyped for rs11209026, rs2201841 and rs10889677 by real time/polymerase chain reaction (real-time/PCR) for the first SNP and restriction fragment length polymorphism/PCR (RFLP/ PCR) in the last two SNPs.

Results: Our data emphasise that the AA genotype of rs11209026 (Arg381Gln) was significantly associated with RA patients compared to the controls (P value = 0.001).We did not find any significant association between either rs2201841 or rs10889677 and the development of rheumatoid arthritis (P value = 1.000 & 0.562 respectively).

Conclusion: Our **Results** suggest that IL23 receptor AA genotype variant of rs11209026 would contribute to RA aetiology; consequently, it might be a genetic marker for RA. We need to address the subgroup of patients who will benefit from the selective suppression of the IL23 signalling which would represent new perspectives toward a personalized therapy of RA patients by further studies.

Keywords: IL23; IL23 Gene polymorphism; Rheumatoid arthritis.

917. Tissue Inhibitors of Metalloproteinase-1 and 2 and Obesity Related Non-alcoholic Fatty Liver Disease: is There A Relationship?

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Digestion, 92: 130-137 (2015) IF: 2.097

Background/Aims: Non-alcoholic fatty liver disease is a spectrum of clinical conditions, including simple steatosis and non-alcoholic steatohepatitis (NASH). The aim of the study is to evaluate the tissue inhibitors of metalloproteinase- 1 and 2 (TIMPs) as noninvasive predictors of NASH.

Methods: Three groups were included in the study. Obese patients (n = 30) with normal liver enzymes were included in group I and obese patients (n = 30) with elevated liver enzymes with liver biopsy–based diagnosis of NASH were included in group II. Age-matched subjects (n = 30) formed the control as group III. The lipid profile, liver enzyme levels and levels of TIMPs were compared among all the patients and subjects

Results: Comparison of groups I and II showed significantly elevated levels of TIMP-1 and TIMP-2 in group II as compared to group I (p < 0.05). Similarly, comparison between groups II and III showed significantly increased levels of TIMP-1 and TIMP-2 in group II as compared to group III (p < 0.05). TIMP-1 (sensitivity 96.7%, specificity 100%) and TIMP-2 (sensitivity 93.3%, specificity 100%) showed high accuracy in NASH diagnosis.

Conclusion: TIMP-1 and TIMP-2 may be considered noninvasive markers for the diagnosis of NASH.

Keywords: Noninvasive diagnosis of nash; Tissue inhibitors of metalloproteinase; NAFLD; NASH.

918. Disease Characteristics of Systemic Sclerosis Among Egyptian Patients

Mohamed El Basel and Noha Khalil

Kasr Al Aini Medical Journal, 21: 41-46 (2015) IF: 2

Introduction Scleroderma, or systemic sclerosis (SSc), is a chronic connective tissue disease that has been classifi ed as one of the autoimmune rheumatic diseases. The usual hallmarks of SSc are autoimmunity, infl ammation, widespread small-vessel vasculopathy affecting multiple vascular beds, and progressive interstitial and vascular fi brosis in the skin and internal organs. Aim of the work The aim of the study was to determine the disease characteristics and frequency of different clinical manifestations among Egyptian patients.

Patients and Methods Seventy-fi ve patients with SSc, all fulfi lling the criteria of the American College of Rheumatology for classifi cation of scleroderma, were selected for this study. They were being followed up in Cairo University Internal Medicine department. The patients' data were collected by a review of their medical records. We compared the frequency of symptoms in scleroderma patients with both diffuse cutaneous and limited cutaneous sclerosis (dcSSc and lcSSc).

Results Fourteen patients out of 75 (18.7%) had dcSSc and 61/75 (81.3%) had lcSSc. We found that within the limited subtype 11/61 (18%) were male and 50/61 (82%) were female, with a male to female ratio of 1: 4.6. Within the diffuse subtype, 3/14 (21.4%) were male and 11/14 (78.6%) were female, with a male to female ratio of 1: 3.7. Raynaud's phenomenon was the fi rst presenting manifestation (in 77.3%), followed by arthritis (in 12%) and skin tightness (in 9.3%).

Conclusion SSc is more common in the female population than in the male population. lcSSc is more common than dcSSc.

Keywords: Diffuse cutaneous systemic sclerosis; Limited cutaneous systemic sclerosis; Systemic sclerosis.

919. Diagnostic Usefulness of the Random Urine Na/K Ratio in Predicting Therapeutic Response for Diuretics in Cirrhotic Patients with Ascites

Mohamed El Basel, Ahmed El Mazny, Ahmed Emama and Amal El Shehaby

Kasr Al Ainy Medical Journal, 21: 60-65 (2015) IF: 2

Ascites is a major complication of liver cirrhosis which carries a poor prognosis. Diuretics are used in treatment of ascites in addition to salt restriction. Monitoring of diuretic response can be achieved by measurement of 24 hours urinary sodium. The aim of this study is to evaluate the accuracy of using spot urinary sodium/potassium ratio as a reliable alternative to 24 hours urinary sodium in assessment of dietary sodium compliance in patients with liver cirrhosis receiving diuretics. This study was carried out on 60 patients presenting with liver cirrhosis and ascites, admitted at Cairo University Hospitals. All the patients were subjected to full history taking, clinical examination, laboratory investigations including liver function tests, renal function tests, 24 hours urine sample (for measuring of sodium) and spot urine sample (for sodium and potassium). The studied

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patients were divided into 2 groups: diuretic resistant groups (those with 24 hours urinary sodium < 78 mEq) and diuretic sensitive group (with 24 hours urinary sodium > 78 mEq). Patients in diuretic resistant group were 18 patients (30%) and those in diuretic sensitive group were 42 patients (70%). The present study revealed that spot urine Na/K ratio was significantly lower in patients in the diuretic resistant group (2.4±2.2) than in the sensitive group (4.7± 2.3) (P<0.05). The cut off point of Na/K ratio that showed highest accuracy was 3.0. The present study showed also more deterioration of liver function in diuretic resistant patients compared to diuretic sensitive patients. This was noticed in the form of higher Child Pugh score, higher INR, higher billirubin, and lower serum albumin. Conclusion this study revealed highly significant correlation between 24 hours urinary sodium and spot urine sodium/potassium ratio with sensitivity 75%, specificity 91.67% at cutoff point of 3.

Keywords: Urine Na/K ratio; Diuretics in cirrhotic patients; Ascites.

920. Plasma Osteopontin Level in Chronic Liver Disease and Hepatocellular Carcinoma

Shawky A. Fouad

Background: Osteopontin (OPN) is a secreted glycoprotein and is frequently associated with various tumors. Objectives: We sought to investigate the clinical usefulness of the level of plasma OPN, compared to a-fetoprotein (AFP), as a biomarker for hepatocellular carcinoma (HCC) and to evaluate its diagnostic value in nonalcoholic fatty liver disease (NAFLD) and its relationship with clinical and laboratory features of HCC and Nafld.

Patients and Methods: The study was performed on 120 subjects classified into 5 groups: Group I included 25 chronic non-cirrhotic hepatitis C virus (HCV)-infected patients; Group II encompassed 25 patients with chronic HCV infection with liver cirrhosis; Group III comprised 25 patients with chronic HCV with liver cirrhosis and HCC; Group IV was comprised of 25 patients with NAFLD; and Group V consisted of 20 healthy age- and sex-matched controls. All the participants were subjected to history taking and clinical and abdominal ultrasonographic examinations as well as the following laboratory investigations: liver function tests, complete blood count, blood sugar, hepatitis B surface antigen, hepatitis C virus antibodies, HCV-RNA by qualitative polymerase chain reaction (for Groups I, II, and III) and serum AFP and plasma OPN levels.

Results: There were statistically significant differences in plasma OPN levels between the HCC group (401 ± 72 ng/mL) and the other groups, between the cirrhotic group (258.3 ± 35 ng/mL) and the non-cirrhotic group (HCV group, 168.7 ± 41 ng/mL; fatty liver group, 106.7 ± 35 ng/mL), and between the chronic non-cirrhotic HCV group and the fatty liver group (I and IV) and the controls (35.1 ± 6 ng/mL). In the HCC group, the diagnostic value of OPN was comparable to that of AFP at a cutoff value of 280 ng/mL, achieving sensitivity, specificity, and overall accuracy of 100%, 98%, and 96%, respectively. Regarding the validity of plasma OPN as a predictor of fatty change, our Results revealed a diagnostic accuracy of 50% with 70% sensitivity, 45% specificity, 50% positive predictive value, and 75% negative predictive value at a cutoff value of 134 ng/mL.

Conclusions: Plasma OPN is comparable to AFP as a diagnostic marker and is related to the severity of liver involvement in HCC patients. Plasma OPN is of diagnostic potential value in NAFLD.
Keywords: Osteopontin; Hepatocellular carcinoma; Fatty liver.

921. Relation Between Glutathione S-transferase Genes (GSTM1, GSTT1, and GSTP1) Polymorphisms and Clinical Manifestations of Sickle Cell Disease in Egyptian Patients

Hend N. Ellithy, Sherif Yousri and Gehan H. Shahin

Objectives: Clinical manifestations of sickle cell disease (SCD) result from sickling of Hb S due to oxidation, which is augmented by accumulation of oxygen-free radicals. Deficiencies in normal antioxidant protective mechanism might lead to clinical manifestations of SCD like vaso-occlusive crisis (VOC) and acute chest syndrome (ACS). The glutathione system plays an important role in the removal of endogenous products of peroxidation of lipids, thus protecting cells and tissue against damage from oxidative stress. Impairment of the glutathione system due to genetic polymorphisms of glutathione S-transferase (GST) genes is expected to increase the severity of SCD manifestations. This report describes a case control study aimed at studying the ethnic-dependent variation in the frequency of GST gene polymorphisms among participants selected from the Egyptian population and to find out the association between GST gene polymorphisms and the severity of SCD manifestations.
Methods: We measured the frequency distribution of the three GSTs gene polymorphisms in 100 Egyptian adult SCD patients and 80 corresponding controls. GSTM1 and GSTT1 genotypes were determined by multiplex polymerase chain reaction (PCR). GSTP1 genotyping was conducted with a PCR-restriction fragment length polymorphism assay.
Results: The GSTM1 null genotype was significantly associated with ACS and VOC (P= 0.03 and 0.01, respectively). The GSTT1 null genotype was associated with significantly increased requirement of blood transfusion (P= 0.01). Absence of both GSTM1 and GSTT1 genes was significantly associated with pulmonary hypertension (P = 0.04). The non-wild-type GSTP1 polymorphism was not associated with clinical manifestations of SCD. Discussion: Some GST gene polymorphisms were significantly associated with the worsening of the clinical manifestations of SCD.
Keywords: Sickle cell disease; Glutathione s-transferase genes polymorphisms; Acute chest syndrome; Vaso-occlusive crisis.

922. Comparison of Different Scoring Systems in Predicting Short-Term Mortality after Liver Transplantation

Elsayed F G, Sholkamy A A, Elshazli M, Elshafie M and Naguib M

Background: Many scoring systems have been used in predicting the outcomes of liver transplantations. The aim of this study was to compare between 4 scoring systems-Sequential Organ Failure Assessment (SOFA), Model for End-Stage Liver Disease, Acute Physiology and Chronic Health Evaluation II, and

Child Turcotte-Pugh -among patients who underwent living-donor liver transplantation (LDLT) seeking to evaluate the best system to correlate with post-operative outcomes.

Methods: This study retrospectively reviewed the medical records of 53 patients who had received LDLT in a tertiary care hospital from January 2005 to December 2010. Demographic, clinical, and laboratory data were recorded. Each patient was assessed by use of 4 scoring systems before transplantation and on post-operative days 1 to 7 and at 3 months.

Results: The overall 3-month survival rate was 64%. The pre-transplant SOFA score had the best discriminatory power; moreover, the SOFA score on post-operative day 7 had the best Youden index (.875). The survival rate at 3-month follow-up after liver transplantation differed significantly (P = .00023, highest area under the receiver operator characteristic curve = .952) between patients who had SOFA scores <8 and those had SOFA score >8 on post-liver transplant day 7. This study also demonstrated that respiratory rate (P = .017) and serum bilirubin level (P = .048) and duration of intensive care unit stay (P = .04) are significant risk factors related to early mortality after LDLT.

Conclusions: The pre-transplant SOFA score was a statistically significant predictor of 3-month mortality; SOFA score on post-liver transplant day 7 had the best discriminative power for predicting 3-month mortality.

923. Serum Fetuin A Levels: are They A Reliable Marker for Hepatic Steatosis and Regional Adiposity in Renal Transplant Recipients?

A. Roshdy, H. Okash, A. Soliman, H. Maamoun, O. Shaker, M.A. Soliman and A. Hamdy

Background Fetuin A is a protein expressed in the liver and it is an important inhibitor of ectopic calcification. High levels of fetuin A correlate with insulin resistance, hepatic steatosis, and regional adiposity in the general population. The association between hepatic steatosis and fetuin A level in renal transplant recipients (RTRs) remains unclear. Aim The aim of this study was to explore the relationships between fetuin A, hepatic steatosis, and regional adiposity in RTRs.

Methods Data from 44 patients with normal renal functions were included, all subjected to history taking for clinical data, assessment of central obesity and regional adiposity, assessment of hepatic steatosis using abdominal ultrasound (US), and measurements of serum fetuin A concentration using enzyme-linked immunosorbent assay (ELISA) kits.

Results Our study included 20 females (45.4%) and 24 males (54.6%) with mean age of 41.26 ± 11.2 years. Twenty-four subjects had hepatic steatosis. Fetuin A level in RTRs with hepatic steatosis with a mean of 1642.92 ± 358.91 is significantly higher (P < .001) than those without hepatic steatosis with a mean of 711.74 ± 57.85. Serum fetuin A level was positively correlated with regional adiposity (P = .021) and hepatic steatosis grade (P = .017). Fetuin A level increased with increased duration after renal transplantation (P < .001). The best cutoff value for detecting entrance into phase 3 or 4 steatosis is fetuin of 1862 with sensitivity of 88.9% and specificity of 87.7%.

Conclusions Fetuin A is positively correlated with hepatic steatosis and regional adiposity in RTRs. Fetuin increases with increased duration after renal transplantation. Accordingly it may

be used as a marker for hepatic steatosis and regional adiposity in these patients.

Keywords: Fetuin A; Renal transplant: Hepatic steatosis.

924. Doppler Assessment of Renal Hemodynamic Alterations in Homozygous Sickle Cell Disease and Sickle β-thalassemia

Aasem Saif, Neveen Soliman and Alaa Abdelhamid

We evaluated the renal vascular indices in children and adolescents with sickle cell disease (SCD) using Doppler ultrasonography. We also assessed the renal hemodynamics alterations in patients with homozygous SCD and sickle beta-thalassemia (sickle β-thalassemia). We studied 75 patients (age range = 3-20 years; M = 9.95 ± 4.15) with SCD: 42 patients suffering from homozygous SCD and 33 patients diagnosed with sickle β-thalassemia. Thirty, age- and sex-matched, normal subjects were also included as a control group. Both patients and control groups had Doppler assessment of pulsatility (PI) and resistivity (RI) indices of main renal, segmental, interlobar, and arcuate arteries. Both PIs and RIs were significantly higher in SCD patients, compared with the control group. Among patients, PIs and RIs in the main renal, segmental, interlobar, and arcuate arteries were significantly higher in patients with homozygous SCD as compared with those with sickle β-thalassemia (p values <0.01, <0.001, <0.001, and <0.001 for PIs and <0.001, <0.001, <0.001, and <0.01 for RIs, respectively). We concluded that renal vascular resistance is raised in children and adolescents with SCD. This is more pronounced in patients with homozygous SCD as compared with those with sickle β-thalassemia.

Keywords: Doppler ultrasonography; Renal arteries; Resistivity index; Pulsatility index; Sickle cell disease; Sickle β-Thalassemia.

925. The Skin Microcirculatory Changes in the Normal and Hypertensive Elderly

M.S. El Nahid and A. El Ashmaui

cardiac. Several studies aimed to study the functional and structural changes in the skin microcirculation of the elderly population. Controversies rose from whether the encountered changes were due to ageing or due to associated diseases. We, therefore, aimed at studying the skin microcirculation in a group of elderly subjects away from disease states that are known to affect the microcirculatory status. We also studied a group of elderly hypertensive patients for comparison. Both groups were compared to young healthy adults.

Methods: The study population included 145 subjects, divided into three groups: group A: 50 healthy elderly subjects free from diabetes, hypertension and hypercholesterolemia, group B: 60 elderly patients with long standing essential hypertension and group C: 35 young healthy subjects. The microcirculation was assessed by means of the Laser Doppler Fluxmetry (LDF). The provocative test used was the reactive hyperemia test (RH). Further evaluation of the apparent structural abnormalities in skin microvascular structure was done using the capillaroscope.

Results: Results showed no statistically significant difference in the RH measurements between the normal elderly group and the

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control group with a statistically significant difference in the capillary density by capillaroscopy. The hypertensive group revealed different Results.

Conclusion: The study of the microcirculatory changes in normal elderly subjects revealed the presence of structural abnormalities. These changes are independent of any disease state.

Keywords: Capillaroscope; Geriatric; Laser doppler fluxmetry; Microcirculation; Reactive hyperemia.

926. Eight Year Outcomes of the Cairo Kidney Centre Sequential Protocol

Tarek Fayad, Emad William, Nasr Tawfik, Boulos Habashy, Hazem S. Abou-Youssef, Sameh Shokry, Soha Khalil, Ahmed Morsy and Rashad Barsoum

Experimental and Clinical Transplantation, 13 supp1: 23-29 (2015) IF: 0.622

Objectives: To describe the long-term Results of a previously developed a sirolimus-based sequential immunosuppression protocol for kidney transplant comprising 2 phases: sirolimus + cyclosporine + prednisolone for 3 months followed by sirolimus + prednisolone + mycophenolate mofetil with steroid minimization the first year. Two-year outcomes of patients on this protocol (group A) showed equivalent patient and graft survival, yet with significantly better function, compared with those on cyclosporine + mycophenolate mofetil + prednisolone (group B).

Materials and Methods: We report the 8-year outcomes in the same cohort (76 patients in group A and 37 in group B).

Results: 42% switched from group A to B versus 43% switching from B to A. Intent-to-treat patient survivals at 5 and 8 years were 88% and 85.5% for group A, and 78% and 73% for group B. Death-censored graft survivals were 93% for group A and 95% for group B. Graft function was significantly better at 8 years, with 91% of group A patients compared with 50% in group B having estimated glomerular filtration rates > 45 mL/min/1.73 m2, and a significantly lower incidence of chronic allograft nephropathy in the former. Secondary parameters including blood pressure control, new onset diabetes mellitus, proteinuria and other drug-related adverse events showed no significant differences between the groups.

Conclusions: The sirolimus-based sequential immunosuppression protocol was well tolerated in 58% of patients. The intent-to-treat and patients-ontherapy analyses revealed that it was equivalent to the widely used cyclosporine + mycophenolate mofetil + prednisolone protocol regarding patient and graft survival. It is associated with better graft function and lower incidence of chronic allograft nephropathy in 8 years' follow-up. The incidence of drug-related adverse reactions was not statistically different from those in the comparator.

Keywords: Kidney transplant; Sirolimus; Sequential immunosuppression; Calcineurin inhibitor toxicity.

927. Assessment of Premature Coronary Atherosclerosis in Patients with Systemic Lupus Erythematosus Disease

Tarek S. Heshmat, Noha M. Khalil, Huda Abd Elhamid, Safa Labib and Mamdoh Mahfouz

The Egyptian Rheumatologist, 37: 43-47 (2015)

Introduction Systemic lupus erythematosus (SLE) is a chronic inflammatory autoimmune disease that affects mainly young women. The incidence of myocardial infarction is 5 times higher in SLE patients than in the general population. Aim of the work The aim of our study was to assess the frequency and extent of coronary artery calcification as measured by multidetector computed tomography (CT) in SLE patients and to identify the associated variables.

Patients and Methods Thirty SLE patients and 30 matched healthy controls were included in the study. Patients were not known to have atherosclerosis. Patients and controls were subjected to full history taking, clinical examination, laboratory investigations including complete blood count, urine analysis, serum urea, creatinine, homocysteine, triglycerides, total cholesterol, high and low density lipoproteins. Multi detector CT study of the coronaries was performed.

Results Coronary calcification was detected in 4 (13.3%) of the patients and none of the control. The homocysteine level was significantly higher in the patients (13.42 ± 5.33 µmol/L) compared to the control (9.39 ± 1.48 µmol/L) ($p = 0.002$). The calcium score was 42 ± 111.09 in the patients and zero in the control. The calcification score of the 4 patients was between 101 and 400. Patients with calcification had significantly higher cholesterol, triglycerides and homocysteine levels ($p < 0.0001$, $p = 0.032$ and $p = 0.002$, respectively). The calcium score significantly correlated with the serum cholesterol ($r = 0.54$, $p = 0.002$) and homocysteine level ($r = 0.78$, $p = 0.001$).

Conclusion Premature coronary artery calcification is more common in SLE patients than in the general population. Subclinical atherosclerosis in SLE is associated with traditional risk factors like hypercholesterolemia and hypertriglyceridemia as well as increased homocysteine level.

Keywords: Systemic lupus; Erythematosus; Coronary atherosclerosis; Coronary calcification; Multidetector Ct.

928. Assessment of Left Ventricular Function in Systemic Lupus Erythematosus Patients by Speckle Tracking Echocardiography: Relation to Circulating Endothelial Progenitor Cells

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The Egyptian Rheumatologist, 37: 33-41 (2015)

Background Systemic lupus erythematosus is an autoimmune disease associated with reduced number and impaired function of endothelial progenitor cells (EPCs) responsible for vascular regeneration. Aim of the work to assess left ventricular (LV) function of SLE patients using relatively new speckle tracking echocardiography (STE) and examine the relation of any detected abnormalities with peripheral circulating EPC level. Patients and **Methods** Fifty SLE patients and 25 healthy controls were subjected to quantification of peripheral circulating Cluster of differentiation133+/vascular endothelial growth factor receptor2+(CD133+/VEGFR2+) and CD34+/VEGFR2+ EPCs, transthoracic echocardiography (TTE), tissue Doppler imaging (TDI) and STE.

Results Patients showed a significantly lower CD133+/VEGFR2+ EPCs ($p = 0.009$) and CD34+/VEGFR2+ EPC counts ($p = 0.0001$) compared to controls. TTE/TDI revealed a significantly lower LV ejection fraction (EF) ($p = 0.007$), higher LV end systolic dimensions ($p = 0.02$), myocardial performance

index (MPI) (p = 0.0001) and mitral flow E/lateral annulus E' ratio (p = 0.002) in patients compared to controls. STE showed a significantly lower global longitudinal strain (GLS) (p < 0.001), global circumferential strain (GCS) (p < 0.001) and global strain rate during isovolumic relaxation period (GSRivr) (p = 0.01) in patients compared to controls. By multiple logistic regression analysis, the independent variables affecting GCS and GSRivr were the prednisolone dose and the LVEF respectively. (95% CI = -0.46 to -0.03; p = 0.03 and 95% CI = 0.001–0.01; p = 0.021; respectively). There was no significant correlation of the GLS, GCS or GSRivr with the EPCs.

Conclusion   STE detected subclinical systolic and diastolic abnormalities of LV function in SLE patients. These abnormalities of LV function did not show however any relation with the significantly lower EPC count detected in patients.

Keywords: Systemic lupus erythematosus; Endothelial progenitor cells; Left ventricular function; Speckle tracking echocardiography.

929. Primary Hyperparathyroidism Presenting with Acute Pancreatitis and Asymptomatic Bone Involvement

Aasem Saif

A 15-year-old female patient presented to the emergency room with vomiting and abdominal pain. She had two similar attacks in the previous three months both of them were diagnosed as pancreatitis in two different hospitals. On admission, her serum calcium and parathyroid hormone levels were very high. CT scan revealed left inferior parathyroid adenoma. Investigations to rule out possible multiple endocrine neoplasia were all negative. The patient was managed by intravenous fluids and furosemide to lower her serum calcium level. Then, left inferior parathyroidectomy was done. Postoperatively, the patient had hungry bone syndrome with severe hypocalcaemia and was managed by intravenous calcium infusion for five days in the intensive care unit. Later, she was kept on oral calcium and vitamin D supplementation. She became symptom-free and her serum calcium improved gradually.

Keywords: Acute pancreatitis; Hungry bone syndrome; Hypercalcemia; Primary hyperparathyroidism.

930. SDF-1(CXCL12) Polymorphisms in Egyptian Patients with Systemic Lupus Erythematosus (SLE): A Pilot Study

Sherif Yousry, Gehan Shahin, Doaa El Demerdash and Noha EL Husseiny

SDF-1(CXCL12) is a chemokine that plays an important role in the regulation of migration, proliferation, and differentiation of hematopoietic cells, as well as being involved in the homeostatic and inflammatory traffic of leukocytes. It was suggested that CXCL12 is a key molecule in the development of autoimmunity in the murine model of lupus. It has been demonstrated that SDF-1 has a G801A transition at position 801 in the 3'-untranslated region of the transcript, known as SDF-1-3'G801A. This polymorphism may have an important regulatory function via an increase in the biosynthesis of SDF-1 protein and has been reported in association with autoimmune diseases, such as type 1 diabetes and systemic sclerosis. We investigated the prevalence of SDF-1-3'G801A genotype in Egyptian patients with systemic lupus erythematosus (SLE) (n = 50) and healthy controls (HC) (n = 50) and its relation to SLE manifestations. We found a significant correlation between the SDF-1-3'G801A genotype and the following SLE features: photosensitivity, nephritis, serositis, and vasculitis, and also anticardiolipin antibodies. Our observations suggest that the SDF-1-3'-G801A genotype may be associated with some clinical and laboratory manifestations in patients with SLE.

Keywords: SDF-1(CXCL12); SLE; Chemokines; Polymorphism.

Dept. of Medical Biochemistry and Molecular Biology

931. Evaluation of the Amyloid Beta-GFP Fusion Protein as A Model of Amyloid Beta Peptides-Mediated Aggregation: A Study of DNAJP6 Chaperone

Rasha M. Hussein, Reem M. Hashem and Laila A. Rashed

Alzheimer's disease (AD) is a progressive neurodegenerative disease characterized by the accumulation and aggregation of extracellular amyloid b (Ab) peptides and intracellular aggregation of hyper-phosphorylated tau protein. Recent evidence indicates that accumulation and aggregation of intracellular amyloid b peptides may also play a role in disease pathogenesis. This would suggest that intracellular Heat Shock Proteins (HSP) that maintain cellular protein homeostasis might be candidates for disease amelioration. We recently found that DNAJB6, a member of DNAJ family of heat shock proteins, effectively prevented the aggregation of short aggregation-prone peptides containing large poly glutamines (associated with CAG repeat diseases) both in vitro and in cells. Moreover, recent in vitro data showed that DNAJB6 can delay the aggregation of Ab42 peptides. In this study, we investigated the ability of DNAJB6 to prevent the aggregation of extracellular and intracellular Ab peptides using transfection of human embryonic kidney 293 (HEK293) cells with Ab-green fluorescent protein (GFP) fusion construct and performing western blotting and immunofluorescence techniques. We found that DNAJB6 indeed suppresses Ab- GFP aggregation, but not seeded aggregation initiated by extracellular Ab peptides. Unexpectedly and unlike what we found for peptide-mediated aggregation, DNAJB6 required interaction with HSP70 to prevent the aggregation of the Ab-GFP fusion protein and its J-domain was crucial for its anti-aggregation effect. In addition, other DNAJ proteins as well as HSPA1a overexpression also suppressed Ab-GFP aggregation efficiently. Our findings suggest that Ab aggregation differs from poly glutamine (Poly Q) peptide induced aggregation in terms of chaperone handling and sheds doubt on the usage of Ab-GFP fusion construct for studying Ab peptide aggregation in cells.

Keywords: AB-GFP; Heat shock proteins; Amyloid beta aggregation; Alzheimer'S disease; Chaperones; DNAJB6

932. Endothelial Progenitor Cells Regenerate Infracted Myocardium with Neovascularisation Development

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Journal of Advanced Research, 6: 133-144 (2015) IF: 3

We achieved possibility of isolation, characterization human umbilical cord blood endothelial progenitor cells (EPCs), examination potency of EPCs to form new blood vessels and differentiation into cardiomyocytes in canines with acute myocardial infarction (AMI). EPCs were separated and cultured from umbilical cord blood. Their phenotypes were confirmed by uptake ofdouble stains dioctadecyl tetramethylindocarbocyanine-labeled acetylated LDL and FITClabeled Ulex europaeus agglutinin 1 (DILDL-UEA-1). EPCs of cord blood were counted. Human VEGFR-2 and eNOS from the cultured EPCs were assessed by qPCR. Human EPCs was transplanted intramyocardially in canines with AMI. ECG and cardiac enzymes (CK-MB and Troponin I) were measured to assess severity of cellular damage. Histopathology was done to assess neovascularisation. Immunostaining was done to detect EPCs transdifferentiation into cardiomyocytes in peri-infarct cardiac tissue. qPCR for human genes (hVEGFR-2, and eNOS) was done to assess homing and angiogenic function of transplanted EPCs. Cultured human cord blood exhibited an increased number of EPCs and significant high expression of hVEGFR-2 and eNOS genes in the culture cells. Histopathology showed increased neovascularization and immunostaining showed presence of EPCs newly differentiated into cardiomyocytelike cells. Our findings suggested that hEPCs can mediate angiogenesis and differentiate into cardiomyoctes in canines with AMI.

Keywords: Human EPCs; Neovascularization; Canine; Acute myocardial infarction.

933. Efficacy of A Novel Water-soluble Curcumin Derivative Versus Sildenafil Citrate in Mediating Erectile Function

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International Journal of Impotence Research, 27: 9-15 (2015) IF: 1.756

The present study was conducted to assess the efficacy of a novel curcumin derivative (NCD) versus sildenafil citrate in erectile signaling. The study was conducted on 10 control male rats and 50 diabetic male rats divided into the following groups: diabetic, curcumin, NCD, sildenafil and NCD combined with sildenafil. Cavernous tissue (CC) gene expression levels of heme oxygenase (HO)- 1, Nrf2, NF-kb and p38, enzyme activities of HO and nitric oxide synthase (NOS), cyclic guanosine monophosphate (cGMP) and intracavernosal pressure (ICP) were assessed. Results showed that 12 weeks after induction of diabetes, erectile dysfunction was confirmed by the significant decrease in ICP, a significant decrease in cGMP, NOS, HO enzyme activities, a significant decrease in HO-1 gene and a significant elevation of NF-kb, p38 genes. Administration of all therapeutic interventions led to a significant elevation in ICP, cGMP levels, a significant increase in HO-1 and NOS enzymes, a significant increase in HO-1 and

Nrf2 gene expression, and a significant decrease in NF-kb, p38 gene expression. NCD or its combination with sildenafil showed significant efficacy and more prolonged duration of action. In Conclusion, NCD could enhance erectile function with more efficacy and more prolonged duration of action.

Keywords: Curcumin; Sildenafil citrate; Erectile function; Nitric oxide synthase; Heme oxygenase; cGMP.

934. Molecular Signalling of A Novel Curcumin Derivative Versus Tadalafil in Erectile Dysfunction

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Andrologia, 47: 616-625 (2015) IF: 1.63

The efficacy of a novel curcumin derivative (NCD) versus tadalafil in erectile signalling was assessed. Ten control male rats and 50 diabetic male rats were used and divided into the following: diabetic (DM), curcumin (CURC), NCD, tadalafil and NCD combined with tadalafil rat groups. Cavernous tissue gene expression of heme oxygenase-1 (HO-1), Nrf2, NF-B and p38, enzyme activities of heme oxygenase (HO) and nitric oxide synthase (NOS), cGMP and intracavernosal pressure (ICP)/mean arterial pressure (MAP) were assessed. Results showed that 12 weeks after induction of diabetes, erectile dysfunction (ED) was confirmed by the significant decrease in ICP/MAP, a significant decrease in cGMP, NOS, HO enzyme activities, a significant decrease in HO-1 gene and a significant increase in NF- $\mathcal{K}\beta$, p38 genes. Administration of all therapeutic interventions led to a significant increase in ICP/MAP, cGMP levels, a significant increase in HO-1 and NOS enzymes, a significant increase in HO-1, and Nrf2 gene expression, and a significant decrease in NF-$\mathcal{K}\beta$, p38 gene expression. NCD or its combination with tadalafil showed significant superiority and more prolonged duration of action. In Conclusion, a tendency was observed that CURC and NCD have high efficacy and more prolonged duration of action in enhancing erectile function.

Keywords: Cgmp; Curcumin; Erectile dysfunction; Ho-1; Intracavernosal pressure; NOS.

935. Beneficial Effects of Bone Marrow-Derived Mesenchymal Stem Cell Transplantation in A Non-Immune Model of Demyelination

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Annals of Anatomy, 198: 11-20 (2015) IF: 1.483

Multiple sclerosis (MS) is an autoimmune disease characterized by demyelination and axonal loss throughout the central nervous system. Most of the previous studies that have been conducted to evaluate the efficacy of mesenchymal stem cells (MSCs) have utilized immune models such as experimental autoimmune encephalomyelitis (EAE). However, with this experimental setting, it is not clear whether the MSCs exert the functional improvement via an indirect consequence of MSC-mediated immunomodulation or via a direct replacement of the lost cells, paracrine actions, and/or an enhancement of endogenous repair. This study is the first to demonstrate the capability of intravenously injected bone marrow-derived MSCs (BM-MSCs) to migrate, engraft, and improve the demyelination in the non-immune cuprizone model of MS. The ultrastructural analysis

conducted in this study revealed that the observed histological improvement was due to both reduced demyelination and enhanced remyelination. However, the detected remyelination was not graft-derived as no differentiation of the transplanted cells towards the oligodendroglial phenotype was detected. In addition, the transplanted cells modulated the glial response and reduced apoptosis. These Results suggest that the therapeutic potential of BM-MSCs for MS is not only dependent on their immunosuppressive and immunomodulatory nature but also on their ability to enhance endogenous repair and induce oligo/neuroprotection. Proving the efficacy of BM-MSCs in a non-immune model of MS and evaluating the underlying mechanisms should enrich our knowledge of how these cells exert their beneficial effects and may eventually help us to enhance and maintain an efficacious and sustainable cell therapy for MS.

Keywords: Bone marrow-derived mesenchymal stem cells; Intravenous; Transplantation; Cuprizone; Demyelination.

936. The Role of Cyclooxygenase-2 and Prostaglandin E2 in the Pathogenesis of Cutaneous Lichen Planus

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Clinical and Experimental Dermatology, 40: 903-907 (2015) IF: 1.092

Background. Lichen planus (LP) is an inflammatory disease of the skin and mucous membranes. Autoimmunity has been suggested as a possible cause of this disease. The cyclooxygenase enzymes (COX-1, COX-2) are the key enzymes in the conversion of arachidonic acid into prostaglandins. Prostaglandin E2 (PGE2), a key product of COX-2, has an immunomodulatory role. Aim. To map levels of COX-2 and PGE2 in cutaneous LP lesions and evaluate their role in the pathogenesis of the disease.

Methods. In total, 31 patients with classic cutaneous LP and 30 age- and sexmatched healthy controls were enrolled. Skin biopsies were taken from the lesional and nonlesional skin of patients, and from the normal skin of controls. COX-2 mRNA expression was detected by real-time reverse transcription quantitative PCR, and PGE2 was detected by ELISA in skin biopsies from patients and controls.

Results. Our analysis revealed a significantly higher expression of COX-2 mRNA and PGE2 in the LP skin biopsies compared with the control biopsies (P < 0.001 and P < 0.001, respectively). Lesional biopsies showed significantly higher expression of COX-2 mRNA and PGE2 compared with nonlesional biopsies. The levels of COX-2 and PGE2 were not found to be correlated with age, sex or disease duration.

Conclusions. COX-2 and its product PGE2 are strongly expressed in LP skin lesions, indicating that they have a role in the pathogenesis of LP through their immunomodulatory effects.

Keywords: Cyclooxygenase; Prostaglandin; Lichen plannus.

937. Vitamin D Receptor Expression in Vitiligo

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Indian Journal of Dermatology, 6: 544-548 (2015)

Background: Vitiligo is a progressive depigmenting disorder characterized by loss of functional melanocytes from the

epidermis. The etiopathogenesis of vitiligo is still unclear. Vitamin D has stimulatory effects on melanocytes and acts through its nuclear Vitamin D receptor (VDR) on target cells. Aims and Objectives: The purpose of this study was to declare the role of Vitamin D in the pathogenesis of vitiligo. Materials and **Methods**: This case-control study included 30 vitiligo patients and 30 age, gender-matched healthy controls. Blood samples were withdrawn from the study subjects, and the serum 25(OH) D level was determined by an enzyme-linked immunosorbent assay technique. Serum 25(OH) D levels were divided into: Normal or sufficient (=30 ng/ml), insufficient (< 30–> 20 ng/ml), and deficient (=20 ng/ml) levels. Skin biopsies were obtained from the depigmented lesions and clinically normal skin of vitiligo patients and from the controls, and VDR gene expression was determined using real-time polymerase chain reaction.

Results: Only 10 patients with vitiligo (33.3%) had sufficient serum 25(OH) D levels (=30 ng/ml), 12 patients (40%) had insufficient levels, and 8 patients (26.7%) had deficient levels. On the other hand, most of the controls (96.7%) had sufficient levels. The mean serum 25(OH) D level in patients was significantly decreased compared to controls (P < 0.001). The VDR-mRNA expression was also significantly decreased in lesional and nonlesional skin of patients compared to controls (P < 0.001, P < 0.001, respectively).

Conclusion: Vitamin D deficiency influences the extent of vitiligo and could contribute to the pathogenesis of vitiligo through its immunomodulatory role and its role in melanogenesis.

Keywords: 25-hydroxy vitamin D; Enzyme-linked immunosorbent assay; Real-time polymerase chain reaction; Vitamin D receptor; Vitiligo.

Dept. of Neurology

938. Global, Regional, and National Disability-Adjusted Life Years (DALYS) for 306 Diseases and Injuries and Healthy Life Expectancy (HALE) for 188 Countries, 1990-2013: Quantifying the Epidemiological Transition

Foad Abd-Elmoniem Abd-Allah

The Lancet, 386: 2145-2191 (2015) IF: 45.217

The Global Burden of Disease Study 2013 (GBD 2013) aims to bring together all available epidemiological data using a coherent measurement framework, standardised estimation Methods, and transparent data sources to enable comparisons of health loss over time and across causes, age-sex groups, and countries. The GBD can be used to generate summary measures such as disability-adjusted life-years (DALYs) and healthy life expectancy (HALE) that make possible comparative assessments of broad epidemiological patterns across countries and time. These summary measures can also be used to quantify the component of variation in epidemiology that is related to sociodemographic development. We used the published GBD 2013 data for age-specific mortality, years of life lost due to premature mortality (YLLs), and years lived with disability (YLDs) to calculate DALYs and HALE for 1990, 1995, 2000, 2005, 2010, and 2013 for 188 countries. We calculated HALE using the Sullivan method; 95% uncertainty intervals (UIs) represent uncertainty in age-specific death rates and YLDs per person for each country, age, sex, and year. We estimated DALYs for 306 causes for each country as the sum of YLLs and YLDs; 95% UIs represent

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uncertainty in YLL and YLD rates. We quantified patterns of the epidemiological transition with a composite indicator of sociodemographic status, which we constructed from income per person, average years of schooling after age 15 years, and the total fertility rate and mean age of the population. We applied hierarchical regression to DALY rates by cause across countries to decompose variance related to the sociodemographic status variable, country, and time. Worldwide, from 1990 to 2013, life expectancy at birth rose by 6·2 years (95% UI 5·6-6·6), from 65·3 years (65·0-65·6) in 1990 to 71·5 years (71·0-71·9) in 2013, HALE at birth rose by 5·4 years (4·9-5·8), from 56·9 years (54·5-59·1) to 62·3 years (59·7-64·8), total DALYs fell by 3·6% (0·3-7·4), and age-standardised DALY rates per 100 000 people fell by 26·7% (24·6-29·1). For communicable, maternal, neonatal, and nutritional disorders, global DALY numbers, crude rates, and age-standardised rates have all declined between 1990 and 2013, whereas for non-communicable diseases, global DALYs have been increasing, DALY rates have remained nearly constant, and age-standardised DALY rates declined during the same period. From 2005 to 2013, the number of DALYs increased for most specific non-communicable diseases, including cardiovascular diseases and neoplasms, in addition to dengue, food-borne trematodes, and leishmaniasis; DALYs decreased for nearly all other causes. By 2013, the five leading causes of DALYs were ischaemic heart disease, lower respiratory infections, cerebrovascular disease, low back and neck pain, and road injuries. Sociodemographic status explained more than 50% of the variance between countries and over time for diarrhoea, lower respiratory infections, and other common infectious diseases; maternal disorders; neonatal disorders; nutritional deficiencies; other communicable, maternal, neonatal, and nutritional diseases; musculoskeletal disorders; and other non-communicable diseases. However, sociodemographic status explained less than 10% of the variance in DALY rates for cardiovascular diseases; chronic respiratory diseases; cirrhosis; diabetes, urogenital, blood, and endocrine diseases; unintentional injuries; and self-harm and interpersonal violence. Predictably, increased sociodemographic status was associated with a shift in burden from YLLs to YLDs, driven by declines in YLLs and increases in YLDs from musculoskeletal disorders, neurological disorders, and mental and substance use disorders. In most country-specific estimates, the increase in life expectancy was greater than that in HALE. Leading causes of DALYs are highly variable across countries. Global health is improving. Population growth and ageing have driven up numbers of DALYs, but crude rates have remained relatively constant, showing that progress in health does not mean fewer demands on health systems. The notion of an epidemiological transition-in which increasing sociodemographic status brings structured change in disease burden-is useful, but there is tremendous variation in burden of disease that is not associated with sociodemographic status. This further underscores the need for country-specific assessments of DALYs and HALE to appropriately inform health policy decisions and attendant actions.
Keywords: DALY; HALE; Global burden; Epidemiology.

939. Global, Regional, and National Age-Sex Specific All-Cause and Cause-Specific Mortality for 240 Causes of Death, 1990-2013: A Systematic Analysis for the Global Burden of Disease Study 2013

Foad Abd-Elmoniem Abd-Allah

Background: Up-to-date evidence on levels and trends for age-sex-specific all-cause and cause-specific mortality is essential for the formation of global, regional, and national health policies. In the Global Burden of Disease Study 2013 (GBD 2013) we estimated yearly deaths for 188 countries between 1990, and 2013. We used the Results to assess whether there is epidemiological convergence across countries.
Methods: We estimated age-sex-specific all-cause mortality using the GBD 2010 Methods with some refinements to improve accuracy applied to an updated database of vital registration, survey, and census data. We generally estimated cause of death as in the GBD 2010. Key improvements included the addition of more recent vital registration data for 72 countries, an updated verbal autopsy literature review, two new and detailed data systems for China, and more detail for Mexico, UK, Turkey, and Russia. We improved statistical models for garbage code redistribution. We used six different modelling strategies across the 240 causes; cause of death ensemble modelling (CODEm) was the dominant strategy for causes with sufficient information. Trends for Alzheimer's disease and other dementias were informed by meta-regression of prevalence studies. For pathogen-specific causes of diarrhoea and lower respiratory infections we used a counterfactual approach. We computed two measures of convergence (inequality) across countries: the average relative difference across all pairs of countries (Gini coefficient) and the average absolute difference across countries. To summarise broad findings, we used multiple decrement life-tables to decompose probabilities of death from birth to exact age 15 years, from exact age 15 years to exact age 50 years, and from exact age 50 years to exact age 75 years, and life expectancy at birth into major causes. For all quantities reported, we computed 95% uncertainty intervals (UIs). We constrained cause-specific fractions within each age-sex-country-year group to sum to all-cause mortality based on draws from the uncertainty distributions. FINDINGS: Global life expectancy for both sexes increased from 65.3 years (UI 65.0-65.6) in 1990, to 71.5 years (UI 71.0-71.9) in 2013, while the number of deaths increased from 47.5 million (UI 46.8-48.2) to 54.9 million (UI 53.6-56.3) over the same interval. Global progress masked variation by age and sex: for children, average absolute differences between countries decreased but relative differences increased. For women aged 25-39 years and older than 75 years and for men aged 20-49 years and 65 years and older, both absolute and relative differences increased. Decomposition of global and regional life expectancy showed the prominent role of reductions in age-standardised death rates for cardiovascular diseases and cancers in high-income regions, and reductions in child deaths from diarrhoea, lower respiratory infections, and neonatal causes in low-income regions. HIV/AIDS reduced life expectancy in southern sub-Saharan Africa. For most communicable causes of death both numbers of deaths and age-standardised death rates fell whereas for most non-communicable causes, demographic shifts have increased numbers of deaths but decreased age-standardised death rates. Global deaths from injury increased by 10.7%, from 4.3 million deaths in 1990 to 4.8 million in 2013; but age-standardised rates declined over the same period by 21%. For some causes of more than 100,000 deaths per year in 2013, age-standardised death rates increased between 1990 and 2013, including HIV/AIDS, pancreatic cancer, atrial fibrillation and flutter, drug use disorders, diabetes, chronic kidney disease, and sickle-cell anaemias. Diarrhoeal diseases, lower respiratory infections, neonatal causes, and malaria are still in the top five causes of death in children younger than 5 years. The most important pathogens are rotavirus for diarrhoea and

pneumococcus for lower respiratory infections. Country-specific probabilities of death over three phases of life were substantially varied between and within regions.

Interpretation: For most countries, the general pattern of reductions in age-sex specific mortality has been associated with a progressive shift towards a larger share of the remaining deaths caused by non-communicable disease and injuries. Assessing epidemiological convergence across countries depends on whether an absolute or relative measure of inequality is used. Nevertheless, age-standardised death rates for seven substantial causes are increasing, suggesting the potential for reversals in some countries. Important gaps exist in the empirical data for cause of death estimates for some countries; for example, no national data for India are available for the past decade.

Keywords: Mortality; Global burden of disease; Systematic analysis.

940. Global, Regional, and National Incidence, Prevalence, and Years Lived with Disability for 301 Acute and Chronic Diseases and Injuries in 188 Countries, 1990-2013: A Systematic Analysis for the Global Burden of Disease Study 2013

Foad Abd-Elmoniem Abd-Allah

The Lancet, 386: 743-800 (2015) IF: 45.217

Background Up-to-date evidence about levels and trends in disease and injury incidence, prevalence, and years lived with disability (YLDs) is an essential input into global, regional, and national health policies. In the Global Burden of Disease Study 2013 (GBD 2013), we estimated these quantities for acute and chronic diseases and injuries for 188 countries between 1990 and 2013.

Methods Estimates were calculated for disease and injury incidence, prevalence, and YLDs using GBD 2010 Methods with some important refinements.

Results for incidence of acute disorders and prevalence of chronic disorders are new additions to the analysis. Key improvements include expansion to the cause and sequelae list, updated systematic reviews, use of detailed injury codes, improvements to the Bayesian meta-regression method (DisMod-MR), and use of severity splits for various causes. An index of data representativeness, showing data availability, was calculated for each cause and impairment during three periods globally and at the country level for 2013. In total, 35 620 distinct sources of data were used and documented to calculated estimates for 301 diseases and injuries and 2337 sequelae. The comorbidity simulation provides estimates for the number of sequelae, concurrently, by individuals by country, year, age, and sex. Disability weights were updated with the addition of new population-based survey data from four countries. Findings Disease and injury were highly prevalent; only a small fraction of individuals had no sequelae. Comorbidity rose substantially with age and in absolute terms from 1990 to 2013. Incidence of acute sequelae were predominantly infectious diseases and short-term injuries, with over 2 billion cases of upper respiratory infections and diarrhoeal disease episodes in 2013, with the notable exception of tooth pain due to permanent caries with more than 200 million incident cases in 2013. Conversely, leading chronic sequelae were largely attributable to non-communicable diseases, with prevalence estimates for asymptomatic permanent caries and tension-type headache of 2·4 billion and 1·6 billion, respectively.

The distribution of the number of sequelae in populations varied widely across regions, with an expected relation between age and disease prevalence. YLDs for both sexes increased from 537·6 million in 1990 to 764·8 million in 2013 due to population growth and ageing, whereas the age-standardised rate decreased little from 114·87 per 1000 people to 110·31 per 1000 people between 1990 and 2013. Leading causes of YLDs included low back pain and major depressive disorder among the top ten causes of YLDs in every country. YLD rates per person, by major cause groups, indicated the main drivers of increases were due to musculoskeletal, mental, and substance use disorders, neurological disorders, and chronic respiratory diseases; however HIV/AIDS was a notable driver of increasing YLDs in sub-Saharan Africa. Also, the proportion of disability-adjusted life years due to YLDs increased globally from 21·1% in 1990 to 31·2% in 2013. Interpretation Ageing of the world's population is leading to a substantial increase in the numbers of individuals with sequelae of diseases and injuries. Rates of YLDs are declining much more slowly than mortality rates. The non-fatal dimensions of disease and injury will require more and more attention from health systems. The transition to non-fatal outcomes as the dominant source of burden of disease is occurring rapidly outside of sub-Saharan Africa. Our Results can guide future health initiatives through examination of epidemiological trends and a better understanding of variation across countries.

Keywords: Chronic diseases; Injuries; Global burden; Epidemiology.

941. Global, Regional, and National Comparative Risk Assessment of 79 Behavioural, Environmental and Occupational, and Metabolic Risks or Clusters of Risks in 188 Countries, 1990-2013: A Systematic Analysis for the Global Burden of Disease Study 2013

Foad Abd-Elmoniem Abd-Allah

The Lancet, 386: 2287-2323 (2015) IF: 45.217

Background The Global Burden of Disease, Injuries, and Risk Factor study 2013 (GBD 2013) is the first of a series of annual updates of the GBD. Risk factor quantification, particularly of modifiable risk factors, can help to identify emerging threats to population health and opportunities for prevention. The GBD 2013 provides a timely opportunity to update the comparative risk assessment with new data for exposure, relative risks, and evidence on the appropriate counterfactual risk distribution. Methods Attributable deaths, years of life lost, years lived with disability, and disability-adjusted life-years (DALYs) have been estimated for 79 risks or clusters of risks using the GBD 2010 **Methods**. Risk–outcome pairs meeting explicit evidence criteria were assessed for 188 countries for the period 1990–2013 by age and sex using three inputs: risk exposure, relative risks, and the theoretical minimum risk exposure level (TMREL). Risks are organised into a hierarchy with blocks of behavioural, environmental and occupational, and metabolic risks at the first level of the hierarchy. The next level in the hierarchy includes nine clusters of related risks and two individual risks, with more detail provided at levels 3 and 4 of the hierarchy. Compared with GBD 2010, six new risk factors have been added: handwashing practices, occupational exposure to trichloroethylene, childhood wasting, childhood stunting, unsafe sex, and low glomerular

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filtration rate. For most risks, data for exposure were synthesised with a Bayesian meta-regression method, DisMod-MR 2.0, or spatial-temporal Gaussian process regression. Relative risks were based on meta-regressions of published cohort and intervention studies. Attributable burden for clusters of risks and all risks combined took into account evidence on the mediation of some risks such as high body-mass index (BMI) through other risks such as high systolic blood pressure and high cholesterol. Findings All risks combined account for 57·2% (95% uncertainty interval [UI] 55·8–58·5) of deaths and 41·6% (40·1–43·0) of DALYs. Risks quantified account for 87·9% (86·5–89·3) of cardiovascular disease DALYs, ranging to a low of 0% for neonatal disorders and neglected tropical diseases and malaria. In terms of global DALYs in 2013, six risks or clusters of risks each caused more than 5% of DALYs: dietary risks accounting for 11·3 million deaths and 241·4 million DALYs, high systolic blood pressure for 10·4 million deaths and 208·1 million DALYs, child and maternal malnutrition for 1·7 million deaths and 176·9 million DALYs, tobacco smoke for 6·1 million deaths and 143·5 million DALYs, air pollution for 5·5 million deaths and 141·5 million DALYs, and high BMI for 4·4 million deaths and 134·0 million DALYs. Risk factor patterns vary across regions and countries and with time. In sub-Saharan Africa, the leading risk factors are child and maternal malnutrition, unsafe sex, and unsafe water, sanitation, and handwashing. In women, in nearly all countries in the Americas, north Africa, and the Middle East, and in many other high-income countries, high BMI is the leading risk factor, with high systolic blood pressure as the leading risk in most of Central and Eastern Europe and south and east Asia. For men, high systolic blood pressure or tobacco use are the leading risks in nearly all high-income countries, in north Africa and the Middle East, Europe, and Asia. For men and women, unsafe sex is the leading risk in a corridor from Kenya to South Africa. Interpretation Behavioural, environmental and occupational, and metabolic risks can explain half of global mortality and more than one-third of global DALYs providing many opportunities for prevention. Of the larger risks, the attributable burden of high BMI has increased in the past 23 years. In view of the prominence of behavioural risk factors, behavioural and social science research on interventions for these risks should be strengthened. Many prevention and primary care policy options are available now to act on key risks.

Keywords: Risk assessment; Systematic analysis; Global burden of disease.

942. Arbovirus Infections of the Nervous System: Current Trends and Future Threats

Mohammad Wasay, Ismail A. Khatri and Foad Abd-Allah

Systemic viral infections are common. Symptomatic involvement of the nervous system in viral infections is uncommon. Encephalitis is the most worrying manifestation of nervous system involvement by viruses. Arthropod-borne viruses (arboviruses) are among the most serious international infectious threats to the human nervous system.The neurologic diseases that may be transmitted by arthropods to humans include meningitis, encephalitis, myelitis, encephalomyelitis, neuritis (including anterior horn cells and dorsal root ganglia), and myositis.

Keywords: Arbovirus; Encephalitis; Infections.

943. New Strategy to Reduce the Global Burden of Stroke

Norberto Luiz Cabral, Man Mohan Mehndiratta, Dominique Cadilhac, Geoffrey A. Donnan and Foad Abd-Elmoniem Abd-Allah

The socioeconomic and health effect of stroke and other noncommunicable disorders (NCDs) that share many of the same risk factors with stroke, such as heart attack, dementia, and diabetes mellitus, is huge and increasing.1–4 Collectively, NCDs account for 34.5 million deaths (66% of deaths from all causes)3 and 1344 million disability-adjusted life years lost worldwide in 2010.2 The burden of NCDs is likely to burgeon given the aging of the world's population and the epidemiological transition currently observed in many low- to middle-income countries (LMICs).5,6 In addition, there is low awareness in the population about these NCDs and their risk factors,7–10 particularly in LMICs.11 These factors, coupled with underuse of strategies for primary prevention of stroke/NCDs on an individual level and the lack of accurate data on the prevalence and effect of risk factors in different countries and populations have been implicated in the ever-increasing worldwide burden of the NCDs.12–15 Of particular concern is a significant increase in the number of young adults (aged <65 years) affected by stroke,16 and the increasing epidemic of overweight/obesity17 and diabetes mellitus worldwide.18 If these trends continue, the burden of stroke and other major NCDs will increase even faster. The increasing burden of stroke and other major NCDs provide strong support for the notion that the currently used primary prevention strategies for stroke and other major NCDs (business as usual) are not sufficiently effective. The most pertinent solution to this problem is the implementation of new, effective, widely available, and cost-effective prevention and treatment strategies to reduce the incidence and severity distribution of stroke and other major NCDs.

Keywords: Global burden; Stroke; Riskometer.

944. Sex Differences in Stroke Incidence, Prevalence, Mortality and Disability-Adjusted Life Years: Results from the Global Burden of Disease Study 2013

Foad Abd-Allah

Background: Accurate information on stroke burden in men and women are important for evidence-based healthcare planning and resource allocation. Previously, limited research suggested that the absolute number of deaths from stroke in women was greater than in men, but the incidence and mortality rates were greater in men. However, sex differences in various metrics of stroke burden on a global scale have not been a subject of comprehensive and comparable assessment for most regions of the world, nor have sex differences in stroke burden been examined for trends over time.
Methods: Stroke incidence, prevalence, mortality, disability-adjusted life years (DALYs) and healthy years lost due to disability were estimated as part of the Global Burden of Disease (GBD) 2013 Study. Data inputs included all available information on stroke incidence, prevalence and death and case fatality rates.

Analysis was performed separately by sex and 5-year age categories for 188 countries. Statistical models were employed to produce globally comprehensive.

Results over time. All rates were age-standardized to a global population and 95% uncertainty intervals (UIs) were computed.
Findings: In 2013, global ischemic stroke (IS) and hemorrhagic stroke (HS) incidence (per 100,000) in men (IS 132.77 (95% UI 125.34-142.77); HS 64.89 (95% UI 59.82-68.85)) exceeded those of women (IS 98.85 (95% UI 92.11-106.62); HS 45.48 (95% UI 42.43-48.53)). IS incidence rates were lower in 2013 compared with 1990 rates for both sexes (1990 male IS incidence 147.40 (95% UI 137.87-157.66); 1990 female IS incidence 113.31 (95% UI 103.52-123.40)), but the only significant change in IS incidence was among women. Changes in global HS incidence were not statistically significant for males (1990 = 65.31 (95% UI 61.63-69.0), 2013 = 64.89 (95% UI 59.82-68.85)), but was significant for females (1990 = 64.892 (95% UI 59.82-68.85), 2013 = 45.48 (95% UI 42.427-48.53)). The number of DALYs related to IS rose from 1990 (male = 16.62 (95% UI 13.27-19.62), female = 17.53 (95% UI 14.08-20.33)) to 2013 (male = 25.22 (95% UI 20.57-29.13), female = 22.21 (95% UI 17.71-25.50)). The number of DALYs associated with HS also rose steadily and was higher than DALYs for IS at each time point (male 1990 = 29.91 (95% UI 25.66-34.54), male 2013 = 37.27 (95% UI 32.29-45.12); female 1990 = 26.05 (95% UI 21.70-30.90), female 2013 = 28.18 (95% UI 23.68-33.80)).

Interpretation: Globally, men continue to have a higher incidence of IS than women while significant sex differences in the incidence of HS were not observed. The total health loss due to stroke as measured by DALYs was similar for men and women for both stroke subtypes in 2013, with HS higher than IS. Both IS and HS DALYs show an increasing trend for both men and women since 1990, which is statistically significant only for IS among men. Ongoing monitoring of sex differences in the burden of stroke will be needed to determine if disease rates among men and women continue to diverge. Sex disparities related to stroke will have important clinical and policy implications that can guide funding and resource allocation for national, regional and global health programs.

Keywords: Sex differences; Stroke; Epidemiology; Burden; Global.

945. Stroke Prevalence, Mortality and Disability-Adjusted Life Years in Adults Aged 20–64 Years in 1990–2013: Data from the Global Burden of Disease 2013 Study

Foad Abd-Allah

Background: Recent evidence suggests that stroke is increasing as a cause of morbidity and mortality in younger adults, where it carries particular significance for working individuals. Accurate and up-to-date estimates of stroke burden are important for planning stroke prevention and management in younger adults.
Objectives: This study aims to estimate prevalence, mortality and disability-adjusted life years (DALYs) and their trends for total, ischemic stroke (IS) and hemorrhagic stroke (HS) in the world for 1990–2013 in adults aged 20–64 years.
Methodology: Stroke prevalence, mortality and DALYs were estimated using the Global Burden of Disease (GBD) 2013 methods. All available data on rates of stroke incidence, excess mortality, prevalence and death were collected. Statistical models were used along with country-level covariates to estimate country-specific stroke burden. Stroke-specific disability weights were used to compute years lived with disability and DALYs. Means and 95% uncertainty intervals (UIs) were calculated for prevalence, mortality and DALYs. The median of the percent change and 95% UI were determined for the period from 1990 to 2013.
Results: In 2013, in younger adults aged 20–64 years, the global prevalence of HS was 3,725,085 cases (95% UI 3,548,098–3,871,018) and IS was 7,258,216 cases (95% UI 6,996,272–7,569,403). Globally, between 1990 and 2013, there were significant increases in absolute numbers and prevalence rates of both HS and IS for younger adults. There were 1,483,707 (95% UI 1,340,579–1,658,929) stroke deaths globally among younger adults but the number of deaths from HS (1,047,735 (95% UI 945,087–1,184,192)) was significantly higher than the number of deaths from IS (435,972 (95% UI 354,018–504,656)). There was a 20.1% (95% UI –23.6 to –10.3) decline in the number of total stroke deaths among younger adults in developed countries but a 36.7% (95% UI 26.3–48.5) increase in developing countries. Death rates for all strokes among younger adults declined significantly in developing countries from 47 (95% UI 42.6–51.7) in 1990 to 39 (95% UI 35.0–43.8) in 2013. Death rates for all strokes among younger adults also declined significantly in developed countries from 33.3 (95% UI 29.8–37.0) in 1990 to 23.5 (95% UI 21.1–26.9) in 2013. A significant decrease in HS death rates for younger adults was seen only in developed countries between 1990 and 2013 (19.8 (95% UI 16.9–22.6) and 13.7 (95% UI 12.1–15.9)) per 100,000). No significant change was detected in IS death rates among younger adults. The total DALYs from all strokes in those aged 20–64 years was 51,429,440 (95% UI 46,561,382–57,320,085). Globally, there was a 24.4% (95% UI 16.6–33.8) increase in total DALY numbers for this age group, with a 20% (95% UI 11.7–31.1) and 37.3% (95% UI 23.4–52.2) increase in HS and IS numbers, respectively.

Conclusions: Between 1990 and 2013, there were significant increases in prevalent cases, total deaths and DALYs due to HS and IS in younger adults aged 20–64 years. Death and DALY rates declined in both developed and developing countries but a significant increase in absolute numbers of stroke deaths among younger adults was detected in developing countries. Most of the burden of stroke was in developing countries. In 2013, the greatest burden of stroke among younger adults was due to HS. While the trends in declining death and DALY rates in developing countries are encouraging, these regions still fall far behind those of developed regions of the world. A more aggressive approach toward primary prevention and increased access to adequate healthcare services for stroke is required to substantially narrow these disparities. Ed 31% of incident strokes globally [5] . A systematic review of literature on young stroke (between 20 and 44 years) suggests that stroke in those younger than 45 years is not as uncommon as previously perceived with standardized incidence rates ranging from 8.7 to 21.0 per 100,000 [6] . Evidence suggests that changes in unfavorable lifestyle factors such as unhealthy diets high in sugar, salt and processed foods, smoking, alcohol intake, drug use and reduced levels of physical activity have led to the increased exposure to stroke risk factors in the young [7,8] . A population-based study in the United States found an increase in the number of young people aged 18–54 years with stroke, and that over half of these were current smokers and 1 in 5 abused illegal drugs [9] . The long-term impact of stroke is large in younger adults due to the

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impactof lost healthy life years among working-age adults,given their contributions and responsibilities as wageearnersand care-givers. Therefore, estimating the extentof the burden and temporal trends in younger adults withstroke is of critical importance for measuring societal impactand for data-driven public health planning and resour ceallocation.

Keywords: Stroke; Ischemic; Hemorrhagic; Young adult; Global trends; Prevalence; Deaths; DALYs.

946. Stroke Prevalence, Mortality and Disability-Adjusted Life Years in Children and Youth Aged 0–19 Years: Data from the Global and Regional Burden of Stroke 2013

Foad Abd-Allah

Background: There is increasing recognition of stroke as an important contributor to childhood morbidity and mortality. Current estimates of global childhood stroke burden and its temporal trends are sparse. Accurate and up-to-date esti- 2013.

Methodology: Stroke prevalence, mortality and DALYs were estimated using the Global Burden of Disease 2013 methods. All available data on stroke-related incidence, prevalence, excess mortality and deaths were collected. Statistical models and country-level covariates were employed to produce comprehensive and consistent estimates of prevalence and mortality. Stroke-specific disability weights were used to estimate years lived with disability and DALYs. Means and 95% uncertainty intervals (UIs) were calculated for prevalence, mortality and DALYs. The median of the percent change and 95% UI were determined for the period from 1990 to 2013.

Results: In 2013, there were 97,792 (95% UI 90,564–106,016) prevalent cases of childhood IS and 67,621 (95% UI 62,899–72,214) prevalent cases of childhood HS, reflecting an increase of approximately 35% in the absolute numbers of prevalent childhood strokes since 1990.

There were 33,069 (95% UI 28,627–38,998) deaths and 2,615,118 (95% UI 2,265,801–3,090,822) DALYs due to childhood stroke in 2013 globally, reflecting an approximately 200% decrease in the absolute numbers of death and DALYs in childhood stroke since 1990. Between 1990 and 2013, there were significant increases in the global prevalence rates of childhood IS, as well as significant decreases in the global death rate and DALYs rate of all strokes in those of age 0–19 years. While prevalence rates for childhood IS and HS decreased significantly in developed countries, a decline was seen only in HS, with no change in prevalence rates of IS, in developing countries. The childhood stroke DALY rates in 2013 were 13.3 (95% UI 10.6–17.1) for IS and 92.7 (95% UI 80.5–109.7) for HS per 100,000. While the prevalence of childhood IS compared to childhood HS was similar globally, the death rate and DALY rate of HS was 6- to 7-fold higher than that of IS. In 2013, the prevalence rate of both childhood IS and HS was significantly higher in developed countries than in developing countries. Conversely, both death and DALY rates for all stroke types were significantly lower in developed countries than in developing countries in 2013.

Men showed a trend toward higher childhood stroke death rates (1.5 (1.3–1.8) per 100,000) than women (1.1 (0.9–1.5) per 100,000) and higher childhood stroke DALY rates (120.1 (100.8–143.4) per 100,000) than women (90.9 (74.6–122.4) per 100,000) globally in 2013.

Conclusions: Globally, between 1990 and 2013, there was a significant increase in the absolute number of prevalent childhood strokes, while absolute numbers and rates of both deaths and DALYs declined significantly. The gap in childhood stroke burden between developed and developing countries is closing; however, in 2013, childhood stroke burden in terms of absolute numbers of prevalent strokes, deaths and DALYs remained much higher in developing countries. There is an urgent need to address these disparities with both global and country-level initiatives targeting prevention as well as improved access to acute and chronic stroke care.

Keywords: Childhood stroke; Stroke epidemiology; Prevalence; Deaths; Disability-adjusted life years.

947. Update on the Global Burden of Ischemic and Hemorrhagic Stroke in 1990-2013: the GBD 2013 Study

Foad Abd-Allah

Background: Global stroke epidemiology is changing rapidly. Although age-standardized rates of stroke mortality have decreased worldwide in the past 2 decades, the absolute numbers of people who have a stroke every year, and live with the consequences of stroke or die from their stroke, are increasing. Regular updates on the current level of stroke burden are important for advancing our knowledge on stroke epidemiology and facilitate organization and planning of evidence-based stroke care.

Objectives: This study aims to estimate incidence, prevalence, mortality, disability-adjusted life years (DALYs) and years lived with disability (YLDs) and their trends for ischemic stroke (IS) and hemorrhagic stroke (HS) for 188 countries from 1990 to 2013.

Methodology: Stroke incidence, prevalence, mortality, DALYs and YLDs were estimated using all available data on mortality and stroke incidence, prevalence and excess mortality. Statistical models and country-level covariate data were employed, and all rates were age-standardized to a global population. All estimates were produced with 95% uncertainty intervals (UIs).

Results: In 2013, there were globally almost 25.7 million stroke survivors (71% with IS), 6.5 million deaths from stroke (51% died from IS), 113 million DALYs due to stroke (58% due to IS) and 10.3 million new strokes (67% IS). Over the 1990-2013 period, there was a significant increase in the absolute number of DALYs due to IS, and of deaths from IS and HS, survivors and incident events for both IS and HS. The preponderance of the burden of stroke continued to reside in developing countries, comprising 75.2% of deaths from stroke and 81.0% of stroke-related DALYs. Globally, the proportional contribution of stroke-related DALYs and deaths due to stroke compared to all diseases increased from 1990 (3.54% (95% UI 3.11-4.00) and 9.66% (95% UI 8.47-10.70), respectively) to 2013 (4.62% (95% UI 4.01-5.30) and 11.75% (95% UI 10.45-13.31), respectively), but there was a diverging trend in developed and developing countries with a significant increase in DALYs and deaths in developing countries, and no measurable change in the proportional contribution of DALYs and deaths from stroke in developed countries.

Conclusion: Global stroke burden continues to increase globally. More efficient stroke prevention and management strategies are

urgently needed to halt and eventually reverse the stroke pandemic, while universal access to organized stroke services should be a priority.

Keywords: Stroke, Ischemic stroke; Hemorrhagic stroke; Global burden; GBD 2013.

948. Atlas of the Global Burden of Stroke (1990–2013): the GBD 2013 Study

Foad Abd-Allah

Background: World mapping is an important tool to visualize stroke burden and its trends in various regions and countries.

Objectives: To show geographic patterns of incidence, prevalence, mortality, disability-adjusted life years (DALYs) and years lived with disability (YLDs) and their trends for ischemic stroke and hemorrhagic stroke in the world for1990–2013.

Methodology: Stroke incidence, prevalence, mortality, DALYs and YLDs were estimated following the general approach of the Global Burden of Disease (GBD) 2010 with several important improvements in methods.

Data were updated for mortality (through April 2014) and stroke incidence, prevalence, case fatality and severity through 2013. Death was estimated using an ensemble modeling approach. A new software package, DisMod-MR 2.0, was used as part of a custom modeling process to estimate YLDs. All rates were age-standardized to new GBD es- timates of global population. All estimates have been computed with 95% uncertainty intervals.

Results: Age-standardized incidence, mortality, prevalence and DALYs/YLDs declined over the period from 1990 to 2013. However, the absolute number of people affected by stroke has substantially increased across all countries in the world over the same time period, suggesting that the global stroke burden continues to increase. There were significant geographical (country and regional) differences in stroke burden in the world, with the majority of the burden borne by low- and middle-income countries.

Conclusions: Global burden of stroke has continued to increase in spite of dramatic declines in age-standardized incidence, prevalence, mortality rates and disability. Population growth and aging have played an important role in the observed increase in stroke burden.

Keywords: Stroke; Atlas; Burden; GBD 2013.

949. Arabic Cross Cultural Adaptation and Validation of the National Institutes of Health Stroke Scale

Tamer Emara, Foad Abd-Allah, Mohammad Farrag and Ramez Reda Moustafa

Introduction The National Institutes of Health Stroke Scale (NIHSS), the most commonly used tool to quantify neurological deficit in acute stroke, was initially developed in English. We present our experience in developing and validating an Arabic version of the NIHSS (arNIHSS).

Methods A)Scale development phase: 6 bilingual neurologists translated the scale to Arabic. Items 9 and 10 were modified to suit the Arabic language and culture. A panel of 11 Arab neurologists reviewed the final product and an Arabic language expert did final editing. B)Scale validation phase: 10 examiners (four neurology residents and six nurses), who had no experience with the NIHSS, were trained to use the arNIHSS. Patients with acute stroke were recruited at two academic institutions in Egypt. Each patient was examined on admission by 3 examiners using the arNIHSS and at 24 hours by one of the three examiners. The agreement between the first three examinations was used to calculate the interrater agreement. The agreement between the admission and the 24-hour arNIHSS performed by the same examiner was used to calculate the intrarater agreement. Construct validity was evaluated by correlating the arNIHSS on admission with the infarct volume on initial the diffusion weighted imaging (DWI) using the Alberta Stroke Program Early CT score (DWI-ASPECTS) and the functional outcome at 3 months assessed by the modified Rankin Scale (mRS).

Results In 6 months, 137 patients were recruited (mean age ± standard deviation 62 ± 12 years; 48 women). For interrater agreement, weighted kappa value ranged from 0.36 to 0.66 and intraclass correlation coefficient (ICC) for the whole scale was excellent at 0.95 (95% confidence interval [CI] 0.94–0.97). For intrarater agreement, weighted kappa ranged from 0.52 to 1.0 and the ICC was 0.94 (95% CI 0.87–0.98). The construct validity of the arNIHSS is demonstrated by its correlation with the DWI-ASPECT and the 3 months mRS score (Spearman correlation -0.46 and 0.58 respectively; $P < 0.001$ for both).

Conclusion We developed and validated a culturally adapted Arabic version of the NIHSS. Further validation in other Arab countries is recommended.

Keywords: Nihss; Cross-cultural; Translation; Arabic; Ischemic stroke; Neurological examination; Stroke scale; Stroke severity.

950. Corticobasal Degeneration: Clinical Characteristics and Multidisciplinary Therapeutic Approach in 26 Patients

Shehata HS, Shalaby NM, Esmail EH and Fahmy E.

Corticobasal syndrome (CBS) is a sporadic tauopathy that manifests by a various combination of motor and cognitive deficits, which makes its diagnosis challenging. Treatment of CBS is symptomatic and based on evidence from other similar disorders due to the lack of studies on CBS. The aim of the study was to investigate low-frequency repetitive transcranial magnetic stimulation (rTMS) as a therapeutic tool in CBS. Twenty-six patients with clinically evident CBS according to Cambridge criteria were followed for 12–18 months while receiving low-frequency rTMS combined with pharmacological, rehabilitation treatment and botulinum toxin injection. The majority of patients are manifested with akinetic-rigid syndrome and cognitive dysfunction. There was improvement of the UPDRS and quality of life after 3 months of therapeutic interventions ($P < 0.001$ and <0.05, respectively). No significant deterioration in cognitive functions was detected over the study period. There was a significant reduction of caregiver burden after 3 months of interventions ($P < 0.01$); this improvement was maintained up to 18 months. Cognitive dysfunction is a frequent manifestation of CBS. CBS patients can benefit from multidisciplinary therapeutic approach employing low-frequency rTMS.

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Keywords: Corticobasal syndrome; Akinetic rigid; Dementia; Repetitive transcranial magnetic stimulation.

951. Association of Serotonin Transporter Gene (5HTT) Polymorphism and Juvenile Myoclonic Epilepsy: A Case-control Study

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Serotonin levels might alter susceptibility to seizures. Serotonin transporter (5HTT) gene polymorphisms were found to be associated with some forms of epilepsy. Here, we attempted to examine an association between 5HTT VNTR allele variants in a serotonin transporter gene and epileptogenesis in juvenile myoclonic epilepsy (JME) cases. We conducted a case–control candidate gene study evaluating the frequencies of 5HTT VNTR allele variants using SYBR green real-time PCR with melting curve analysis in JME patients and healthy subjects. Forty patients with JME were selected from the Epilepsy Outpatient Clinic of Kasr Al Ainy Hospital, Cairo University, who had been classified according to the electroclinical classification of the ILAE. The control group consisted of 40 healthy Egyptian subjects. The less efficient transcriptional genotypes for 5-HTT polymorphisms were more frequent in JME patients (OR 9.33, CI 2.85–30.60; p value < 0.001). In our study we detected an association between the presence of 5-HTTVNTR with less transcriptional efficient genotypes and JME, which suggests that modulation of the serotoninergic system might be indicated in epileptogenesis in JME.
Keywords: JME; IGE; Serotonin; Epilepsy; Gene.

Dept. of Neuro Surgery

952. Traumatic Subarachnoid Hemorrhage in Developed and Developing Communities

El-Fiki M and El-Ghandour N

World Neurosurg, 83(2): 170-173 (2015) IF: 2.878

The presence of traumatic brain injury is a universal health problem. Its etiology varies among developed and developing communities, and it has a significant effect on survival as well as quality of life, with many patients experiencing disability that drains personal and community resources. These resources might be further stretched in developing countries, complicating and jeopardizing more the limited care these unfortunate patients may receive.
Keywords: Fall from height; Motor vehicle crash; Subarachnoid hemorrhage; Traumatic brain injury.

953. Infratentorial Complications Following Preresection CSF Diversion in Children with Posterior Fossa Tumors

Mohamed Ali El-Gaidi, Ashraf Hesham Abou El-Nasr and Ehab Mohamed Eissa

J Neurosurg Pediatr, 15: 4-11 (2015) IF: 1.482

Object This report presents the incidence, causes, and morbidity and mortality of infratentorial complications following CSF diversion before resection in children with posterior fossa tumors. Method s The medical records of 437 children admitted to Abo El-Reesh Pediatric University Hospital with a diagnosis of posterior fossa tumor between 2005 and 2012 were retrospectively reviewed. Seven children developed neurological deterioration following CSF diversion due to infratentorial complications. Computed tomography scans revealed intratumoral hemorrhage (ITH) in 5 cases, while upward transtentorial herniation (UTH), as evidenced by obliteration of the quadrigeminal and ambient cisterns, was diagnosed in 2 cases.
Results Hydrocephalus was noted in 381 patients, and 301 patients underwent CSF diversion before resection. A ventriculoperitoneal (VP) shunt was used in 214 patients, and 6 children (2.8% of shunted cases) deteriorated neurologically (4 due to ITH and 2 due to UTH). Endoscopic third ventriculostomy (ETV) was performed in 87 patients, 1 of whom developed ITH (1.1% of the patients undergoing ETV). Six patients deteriorated within 8 hours (85.7%), whereas 1 patient, the only survivor, deteriorated after 24 hours. The incidence of infratentorial complications between VP shunts and ETVs was not found to be significantly different (p = 0.659). There was a higher risk of such complications in large posterior fossa tumors (diameter = 4 cm) extending close to the tentorial incisura, especially in patients with severe hydrocephalus and significant peritumoral edema.
Conclusions Infratentorial complications (ITH and UTH) in children with posterior fossa tumors are not uncommon (2.3%) after preresection CSF diversion (VP shunt or ETV) and are associated with a very poor prognosis in most cases, even with surgical intervention.
Keywords: Intratumoral hemorrhage; Posterior fossa tumor; CSF diversion; Upward transtentorial herniation; Hydrocephalus.

954. Epidural Fibrosis after Lumbar Disc Surgery: Prevention and Outcome Evaluation

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Asian Spine Journal, 2015: 9 (3): 370-385 (2015)

Study Design: This is a prospective, randomized, controlled study designed and conducted over 10 years from 2002 to 2012.
Purpose: The study aimed to monitor the effect of suction drains (SD) on the incidence of epidural fibrosis (EF) and to test, if the use of SD alone, SD with local steroids application, SD combined with fat grafts and local steroids application, or SD combined with fat grafts and without local steroids application, would improve outcome.
Overview of Literature: EF contributes to significant unsatisfactory failed-back syndrome. Efforts have been tried to reduce postoperative EF, but none were ideal.
Methods: Between September 2002 and 2012, 290 patients with symptomatic unilateral or bilateral, single-level lumbar disc herniation were included in the study. Two groups were included, with 165 patients in group I (intervention group) and 125 patients in group II (control group). Group I was subdivided into four subgroups: group Ia (SD alone), group Ib (SD+fat graft), group Ic (SD+local steroids), and group Id (SD+fat graft+local steroids).
Results: The use of SD alone or combined with only fat grafts, fats grafts and local steroids application, or only local steroids application significantly improved patient outcome and

significantly reduced EF as measured by magnetic resonance imaging (MRI).

Conclusions: This study has clearly demonstrated the fact that the use of suction drainage alone or combined with only fat grafts, fats grafts and local steroids application, or only local steroids application significantly improved patient outcome with respect to pain relief and functional outcome and significantly reduced EF as measured by an MRI. A simple grading system of EF on MRI was described.

Keywords: Epidural fibrosis; Suction drain; Lumbar; Failed back; Prevention.

Dept. of Obstetrics and Gynecology

955. Culture Media for Human Pre-implantation Embryos in Assisted Reproductive Technology Cycles

Youssef M M A, Mantikou E, van Wely M, Van der Veen F, Al-Inany H G, Repping S and Mastenbroek S

Background: Many media are commercially available for culturing pre-implantation human embryos in assisted reproductive technology (ART) cycles. It is unknown which culture medium leads to the best success rates after ART. OBJECTIVES: To evaluate the safety and effectiveness of different human pre-implantation embryo culture media in used for in vitro fertilisation (IVF) and intracytoplasmic sperm injection (ICSI) cycles.

Search Methods: We searched the Cochrane Menstrual Disorders and Subfertility Group's Trials Register, Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, the National Research Register, the Medical Research Council's Clinical Trials Register and the NHS Center for Reviews and Dissemination databases from January 1985 to March 2015. We also examined the reference lists of all known primary studies, review articles, citation lists of relevant publications and abstracts of major scientific meetings.

Selection Criteria: We included all randomised controlled trials which randomised women, oocytes or embryos and compared any two commercially available culture media for human pre-implantation embryos in an IVF or ICSI programme.

Data Collection and Analysis: Two review authors independently selected the studies, assessed their risk of bias and extracted data. We sought additional information from the authors if necessary. We assessed the quality of the evidence using Grades of Recommendation, Assessment, Development and Evaluation (GRADE) Methods. The primary review outcome was live birth or ongoing pregnancy.

Main Results: We included 32 studies in this review. Seventeen studies randomised women (total 3666), three randomised cycles (total 1018) and twelve randomised oocytes (over 15,230). It was not possible to pool any of the data because each study compared different culture media.

Only seven studies reported live birth or ongoing pregnancy. Four of these studies found no evidence of a difference between the media compared, for either day three or day five embryo transfer. The data from the fifth study did not appear reliable.Six studies reported clinical pregnancy rate.

One of these found a difference between the media compared, suggesting that for cleavage-stage embryo transfer, Quinn's Advantage was associated with higher clinical pregnancy rates than G5 (odds ratio (OR) 1.56; 95% confidence interval (CI) 1.12 to 2.16; 692 women). This study was available only as an abstract and the quality of the evidence was low.With regards to adverse effects, three studies reported multiple pregnancies and six studies reported miscarriage. None of them found any evidence of a difference between the culture media used. None of the studies reported on the health of offspring.Most studies (22/32) failed to report their source of funding and none described their methodology in adequate detail. The overall quality of the evidence was rated as very low for nearly all comparisons, the main limitations being imprecision and poor reporting of study Methods.

Authors' Conclusions: An optimal embryo culture medium is important for embryonic development and subsequently the success of IVF or ICSI treatment. There has been much controversy about the most appropriate embryo culture medium. Numerous studies have been performed, but no two studies compared the same culture media and none of them found any evidence of a difference between the culture media used. We conclude that there is insufficient evidence to support or refute the use of any specific culture medium. Properly designed and executed randomised trials are necessary.

956. Calcium Infusion for the Prevention of Ovarian Hyperstimulation Syndrome: A Double-Blind Randomized Controlled Trial

Waleed El-Khayat and Mostafa Elsadek

Objective To evaluate the role of calcium infusion as a preventive strategy of ovarian hyperstimulation syndrome (OHSS) in women at high risk in in vitro fertilization (IVF)/intracytoplasmic sperm injection (ICSI) treatment cycles. DESIGN: Double-blinded randomized controlled trial. SETTING: University hospital department of obstetrics and gynecology and private IVF center.

Patient(S): Two hundred women at risk to develop OHSS undergoing IVF/ICSI treatment cycle.

Intervention(S): The intervention group (group 1; n = 100) received intravenous infusion of 10 mL 10% calcium gluconate in 100 mL 0.9% saline solution on the day of ovum pick-up (OPU) and days 1, 2, and 3 after, and the placebo group (group 2; n = 100) received 100 mL 0.9% saline solution on the day of OPU and days 1, 2, and 3 after.

Main Outcome Measure(S): Incidence of OHSS.

Result(S): OHSS incidence was significantly higher in the placebo group (group 2) than in the calcium infusion group (group 1): 23 (23%) vs. 7 (7%); moderate OHSS was significantly higher in group 2 than in group 1: 8 (8%) vs. 1 (1%); and severe OHSS was significantly higher in group 2 than in group 1: 4 (4%) vs. 0.

Conclusion(S): Intravenous calcium infusion effectively reduced the incidence of OHSS development without reduction in the pregnancy rate.

Keywords: Ohss; PCO; RCT; Calcium Infusion.

Medicine Sector

957. GnRH Agonist for Final Oocyte Maturation in GnRH Antagonist Co-Treated IVF/ICSI Treatment Cycles Systematic Review and Meta-Analysis

M.A.F. Youssef, Hatem I. Abdelmoty, Mohamed A.S. Ahmed and Maged Elmohamady

Journal of Advanced Research, 6: (2015) IF: 3

Final oocyte maturation in GnRH antagonist co-treated IVF/ICSI cycles can be triggered with HCG or a GnRH agonist. We conducted a systematic review and meta-analysis of randomized controlled trials to evaluate the efficacy and safety of the final oocyte maturation trigger in GnRH antagonist co-treated cycles. Outcome measures were ongoing pregnancy rate (OPR) and ovarian hyperstimulation syndrome (OHSS) incidence. Searches: were conducted in MEDLINE, EMBASE, Science Direct, Cochrane Library, and databases of abstracts. There was a statistically significant difference against the GnRH agonist for OPR in fresh autologous cycles (n = 1024) with an odd ratio (OR) of 0.69 (95% CI: 0.52-0.93). In oocyte-donor cycles (n = 342) there was no evidence of a difference (OR: 0.91; 95% CI: 0.59-1.40). There was a statistically significant difference in favour of GnRH agonist regarding the incidence of OHSS in fresh autologous cycles (OR: 0.06; 95% CI: 0.01-0.33) and donor cycles respectively (OR: 0.06; 95% CI: 0.01-0.27). In Conclusion GnRH agonist trigger for final oocyte maturation trigger in GnRH antagonist cycles is safer but less efficient than HCG

Keywords: HCG; GnRH agonist; GnRH antagonist; OHSS.

958. Gonadotropin-releasing Hormone Antagonists Versus Standard Androgen Suppression Therapy for Advanced Prostate Cancer A Systematic Review with Meta-Analysis

Frank Kunath, Hendrik Borgmann, Anette Blümle, Bastian Keck, Bernd Wullich, Christine Schmucker, Danijel Sikic, Catharina Roelle, Stefanie Schmidt, Amr Wahba and Joerg J Meerpohl

Bmj Open, 5: 1-16 (2015) IF: 2.271

Objectives: To evaluate efficacy and safety of gonadotropin-releasing hormone (GnRH) antagonists compared to standard androgen suppression therapy for advanced prostate cancer. SETTING: The international review team included methodologists of the German Cochrane Centre and clinical experts.
Participants: We searched CENTRAL, MEDLINE, Web of Science, EMBASE, trial registries and conference books for randomised controlled trials (RCT) for effectiveness data analysis, and randomised or non-randomised controlled studies (non-RCT) for safety data analysis (March 2015). Two authors independently screened identified articles, extracted data, evaluated risk of bias and rated quality of evidence according to GRADE.
Results: 13 studies (10 RCTs, 3 non-RCTs) were included. No study reported cancer-specific survival or clinical progression. There were no differences in overall mortality (RR 1.35, 95% CI 0.63 to 2.93), treatment failure (RR 0.91, 95% CI 0.70 to 1.17) or prostate-specific antigen progression (RR 0.83, 95% CI 0.64 to 1.06). While there was no difference in quality of life related to urinary symptoms, improved quality of life regarding prostate symptoms, measured with the International Prostate Symptom Score (IPSS), with the use of GnRH antagonists compared with

the use of standard androgen suppression therapy (mean score difference -0.40, 95% CI -0.94 to 0.14, and -1.84, 95% CI -3.00 to -0.69, respectively) was found. Quality of evidence for all assessed outcomes was rated low according to GRADE. The risk for injection-site events was increased, but cardiovascular events may occur less often by using GnRH antagonist. Available evidence is hampered by risk of bias, selective reporting and limited follow-up.
Conclusions: There is currently insufficient evidence to make firm conclusive statements on the efficacy of GnRH antagonist compared to standard androgen suppression therapy for advanced prostate cancer. There is need for further high-quality research on GnRH antagonists with long-term follow-up.
Keywords: Gnrh antagonist; Gnrh agonist; Advanced prostate cancer.

959. Delayed Start Versus Conventional Gnrh Antagonist Protocol in Poor Responders Pretreated with Estradiol in Luteal Phase: A Randomized Controlled Trial

Ahmed M. Maged, Adel M. Nada, Fouad Abohamila, Ahmed T. Hashem, Walaa AI Mostafa and Ahmed R. Elzayat

Reproductive Sciences, 22(12): 1627-1631 (2015) IF: 2.23

Objective To compare the new delayed start protocol against the conventional gonadotropin (Gn)-releasing hormone antagonist protocol in poor responders (PORs).
Study Design: A total of 160 women with poor response to previous in vitro fertilization (IVF) cycle were randomized either to start Gn then Cetrotide 0.25 subcutaneously (sc) added when leading follicle (DF) reach >12 mm or Cetrotide 0.25 mg sc started first from day 2 to day 8 then Gn therapy was added and Cetrotide restarted when DF reach >12 mm.
Results: There was a statistically significant difference between conventional and delayed start protocols regarding the needed dose of Gn for stimulation (4368 ± 643 and 3798 ± 515), level of estradiol (E2; 778 ± 371 and 1076 ± 453), and endometrial thickness at human chorionic gonadotropin triggering (8.6 ± 1.8 and 9.8 ± 1.9), the number of DF (3.4 ± 1.5 and 4.9 ± 2.1), the number of retrieved follicles (2.4 ± 2.1 and 4.3 ± 2.5), and successful embryo transfer (13 vs 16), respectively (P < .05). There was a highly statistically significant difference between the 2 study groups regarding the number of oocytes fertilized (1.2 ± 2.0 vs 3.3 ± 1.4), metaphase II oocytes (0.9 ± 1.0 vs 2.7 + 1.6), and grade I embryos (0.7 ± 0.9 vs 2.1 + 1.1; P < .001). The chemical pregnancy, clinical pregnancy, and abortion rate showed a statistically significant difference between the 2 study groups (P value .003 and .006, respectively).
Conclusion: Delayed start protocol significantly improved clinical pregnancy rate and IVF cycle parameters in PORs.
Keywords: Gnrh antagonist; Conventional protocol; Delayed start protocol; Poor responders.

960. The Diagnostic Accuracy of Two- Vs Three-Dimensional Sonohysterography for Evaluation of the Uterine Cavity in the Reproductive Age

Walid El-Sherbiny, Akmal El-Mazny, Nermeen Abou-Salem and Wael Sayed Mostafa

J. of Minimally Invasive Gynecology, 22: 127-131 (2015) IF: 1.83

Study Objective To compare 2-dimensional sonohysterography (2D SHG) vs 3-dimensional sonohysterography (3D SHG) using saline solution infusion, with outpatient hysteroscopy as the gold standard, for evaluation of the uterine cavity in women of reproductive age. DESIGN: Comparative observational cross-sectional study (Canadian Task Force classification II-2).

Setting: University hospital.

Patients: One hundred twenty women of reproductive age with abnormal uterine bleeding, infertility, or recurrent pregnancy loss and with clinically and/or ultrasongraphically suspected intrauterine lesions.

Interventions: All patients underwent 2D SHG and 3D SHG using saline solution infusion followed by outpatient hysteroscopy. Sonographic findings were compared with hysteroscopic findings.

Measurements and Main Results: For 2D SHG, sensitivity was 71.2%; specificity, 94.1%; positive predictive value, 90.2%; negative predictive value, 81.0%; and overall accuracy, 84.2%. For 3D SHG, sensitivity was 94.2%; specificity, 98.5%; positive predictive value, 98.0%; negative predictive value, 95.7%; and overall accuracy, 96.7%. Thus, 3D SHG was superior to 2D SHG (p = .02) and comparable with outpatient hysteroscopy (p = .12) for diagnosis of intrauterine lesions.

Conclusion: 3D SHG can be used in the initial evaluation of the uterine cavity in women of reproductive age, with accuracy comparable to that of hysteroscopy.

Keywords: 2D Ultrasound; 3D Ultrasound; Intrauterine lesions; Outpatient hysteroscopy; Sonohysterography.

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961. Hysteroscopic Myomectomy of Large Submucous Myomas in A 1-step Procedure Using Multiple Slicing Sessions Technique

Mohamed Zayed, Usama M. Fouda, Shereef M. Zayed, Khaled A. Elsetohy and Ahmed T. Hashem

Journal of Minimally Invasive Gynecology, 22 (7): 1196-1202 (2015) IF: 1.83

Objective To evaluate the feasibility and efficacy of our technique for resectoscopic removal of large symptomatic submucous myomas.

Design: Prospective study (Canadian Task Force classification II-3).

Setting: A university teaching hospital and a private hospital.

Patients: Forty-nine patients with submucous myomas = 4 cm in diameter complaining of abnormal uterine bleeding. Seventeen patients were also complaining of infertility.

Interventions: The intrauterine portion of submucous myomas was resected using the slicing technique. Slicing started at the site of the maximum bulge of the myoma and was continued down to the level of the endometrial surface. Each slicing session lasted for 5 to 10 minutes. After each slicing session, saline infusion was discontinued and restarted alternatively several times to induce rapid changes in the intrauterine pressure (hydromassage) to stimulate uterine contractions. The resectoscope was removed, and ovum forceps was used to extract the myoma fragments. Bimanual massage of the uterus was performed to induce extrusion of the intramural portion of the myoma into the uterine cavity. The same steps (slicing session lasting for 5-10 minutes to excise the portion of the myoma extruded into the uterine cavity, hydromassage, and uterine massage) were repeated several times until complete removal of the myoma.

Measurements and Main Results: The mean diameter of the principle myomas was 51.94 ± 5.58 mm. The rate of 1-step complete resection of myomas was 91.84% (45/49). Improvement of bleeding symptoms was observed in all patients with complete resection of myomas.

Nine of the 17 infertile women conceived after hysteroscopic myomectomy. One-step complete resection of myomas was more frequent in patients with myomas < 6 cm (43/44 [97.73%] vs 2/5 [40%], risk ratio [RR] = 2.44, p = .002), single myomas (39/40 [97.5%] vs 6/9 [66.67%], RR = 1.46, p = .016), principle myomas with a Lasmar score < 7 (32/32 [100%] vs 13/17 [76.47%], RR = 1.31, p = .011), and myomas with less than 50% extension into the myometrium (26/26 [100%] vs 19/23 [82.61%], RR = 1.21, p = .042). The rate of 1-step complete removal of myomas was 95% (19/20) for type II myomas < 6 cm and 0% (0/3) for type II myomas = 6 cm.

Conclusion: Our technique of hysteroscopic myomectomy is a safe and effective management for submucous myomas up to 6 cm in diameter.

Keywords: Hysteroscopy; Myomectomy; Submucous myoma.

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962. Comparing the Effect of Office Hysteroscopy with Endometrial Scratch Versus Office Hysteroscopy on Intrauterine Insemination Outcome: A Randomized Controlled Trial

Waleed El-Khayat, Mostafa Elsadek and Waleed Saber

European Journal of Obstetrics & Gynecology and Reproductive Biology, 194: 96-100 (2015) IF: 1.695

To evaluate the role of endometrial injury in the cycle preceding ovarian stimulation for intrauterine insemination (IUI) cycle on the clinical pregnancy rate.

Study Design: This was a prospective randomized controlled trial which included three hundred and thirty two infertile women with an indication for IUI. The subjects were randomly divided into two groups.

The intervention group (group A) (n=166) subjects underwent office hysteroscopy with endometrial injury using grasping forceps with teeth, while the control group (group B) (n=166) subjects underwent office hysteroscopy alone without endometrial injury. Primary outcome was clinical pregnancy rate.

Results: There were no significant differences in baseline or clinical characteristics between the groups. There were no significant differences in clinical pregnancy rate [13.8% (23/166) versus 12% (20/166); RR 1.15 (95% CI 0.66-2.01), p=0.62]. The abortion rate [4.3% (1/23) versus 15% (3/20); RR 0.29 (95% CI 0.03-2.57), p=0.27], the multiple pregnancy rate [13% (3/23) versus 15% (3/20); RR 0.87 (95% CI 0.20-3.83), p=0.85] and the live birth rate [13.6% (22/166) versus 10.4% (17/166); RR 1.28 (95% CI 0.71-2.32), p=0.42].

Conclusion: There is no evidence of significant difference on the clinical pregnancy rate when endometrial scratching during hysteroscopy is compared to only hysteroscopy in women undergoing IUI.

Keywords: Endometrial receptivity; Endometrial scratching; Intrauterine insemination; Office hysteroscopy.

Medicine Sector

963. Hysteroscopic Tubal Electrocoagulation Versus Laparoscopic Tubal Ligation for Patients with Hydrosalpinges Undergoing in Vitro Fertilization

Akmal El-Mazny, Nermeen Abou-Salem, Mohamed Hammam and Walid Saber

Objective To investigate the use and success rate of hysteroscopic tubal electrocoagulation for the treatment of hydrosalpinx-related infertility among patients undergoing in vitro fertilization (IVF) who have laparoscopic contraindications.
Methods: A prospective study was conducted among patients who had unilateral or bilateral hydrosalpinges identified on hysterosalpingography and vaginal ultrasonography, and who were undergoing IVF at a center in Cairo, Egypt, between January 1, 2013, and October 30, 2014. All patients who had contraindications for laparoscopy were scheduled for hysteroscopic tubal electrocoagulation (group 1); the other patients underwent laparoscopic tubal ligation (group 2). For all patients, hysterosalpingography was performed 3 months after their procedure to evaluate proximal tubal occlusion.
Results: Among 85 enrolled patients, 22 underwent hysteroscopic tubal electrocoagulation and 63 underwent laparoscopic tubal ligation. The procedure was successful in terms of tubal occlusion for 25 (93%) of 27 hydrosalpinges in group 1, and 78 (96%) of 81 hydrosalpinges in group 2 (P=0.597). No intraoperative or postoperative complications were reported.
Conclusion: Hysteroscopic tubal electrocoagulation was found to be a successful treatment for hydrosalpinges before IVF when laparoscopy is contraindicated.
Keywords: Hydrosalpinx; Hysteroscopy; Infertility; In vitro fertilization; Laparoscopy.

964. Addition of Growth Hormone to the Microflare Stimulation Protocol Among Women with Poor Ovarian Response

Yomna A. Bayoumi, Dina M.R. Dakhly, Yasmin A. Bassiouny and Nawara M. Hashish

Objective To assess the efficacy of adding growth hormone (GH) to the microflare stimulation protocol among women with poor ovarian response.
Methods: A parallel, open-label, randomized controlled trial was conducted among patients with poor ovarian response who attended a center in Cairo, Egypt, between July 10 and December 31, 2014. Participants were randomly assigned using a computer program (random block size of 4-8) to undergo the microflare protocol with or without GH. Primary outcomes were the mean numbers of mature oocytes retrieved and fertilized. Analyses were done per protocol: women with cycle cancellations were excluded.
Results: The analysis included 72 women in the GH group and 73 in the microflare only group. The mean number of oocytes collected was 7.2±1.5 in the GH group versus 4.7±1.2 in the microflare only group (P<0.001). The mean number of metaphase II oocytes was 5.2±1.2 in the GH group and 2.8±1.0 in the microflare only group (P<0.001). The mean number of fertilized

oocytes was higher in the GH group (4.2±1.1) than in the microflare only group (2.5±0.7; P<0.001).
Conclusion: Addition of GH to the microflare stimulation protocol provided some potential benefits to women with poor ovarian response. However, further studies are required before it could be recommended for routine clinical use.
Keywords: Growth hormone; In vitro fertilization; Intracytoplasmic sperm injection; Microflare stimulation protocol; Poor ovarian reserve; Poor ovarian response; Poor responders.

965. A Randomized Placebo-Controlled Trial of Preoperative Tranexamic Acid Among Women Undergoing Elective Cesarean Delivery

Ahmed M. Maged, Omneya M. Helal, Moutaz M. Elsherbini, Marwa M. Eid, Rasha O. Elkomy, Sherif Dahab and Maha H. Elsissy

Objective To study the efficacy and safety of preoperative intravenous tranexamic acid to reduce blood loss during and after elective lower-segment cesarean delivery.
Methods: A single-blind, randomized placebo-controlled study was undertaken of women undergoing elective lower-segment cesarean delivery of a full-term singleton pregnancy at a center in Cairo, Egypt, between November 2013 and November 2014. Patients were randomly assigned (1:1) using computer-generated random numbers to receive either 1g tranexamic acid or 5% glucose 15minutes before surgery. Preoperative and postoperative complete blood count, hematocrit values, and maternal weight were used to calculate the estimated blood loss (EBL) during cesarean, which was the primary outcome. Analyses included women who received their assigned treatment, whose surgery was 90minutes or less, and who completed follow-up.
Results: Analyses included 100 women in each group. Mean EBL was significantly higher in the placebo group (700.3±143.9mL) than in the tranexamic acid group (459.4±75.4mL; P<0.001). Only six women, all in the placebo group, experienced an EBL of more than 1000mL. There were no reports of thromboembolic events up to 4weeks postoperatively.
Conclusion: Preoperative administration of tranexamic acid safely reduces blood loss during elective lower-segment cesarean delivery.
Keywords: Blood loss; Elective cesarean delivery; Tranexamic acid.

966. Third-Trimester Uterine Artery Doppler Measurement and Maternal Postpartum Outcome Among Patients with Severe Pre-Eclampsia

Ahmed M. Maged, Noura ElNassery, Mona Fouad, Aly Abdelhafiz and Walaa Al Mostafa

Objective To evaluate the association between uterine artery Doppler measurements and maternal complications among women with severe pre-eclampsia.

Methods: As part of a cross-sectional study, women with a single intrauterine pregnancy of more than 28 weeks and a diagnosis of severe pre-eclampsia were enrolled at a unit in Cairo, Egypt, between December 2012 and September 2014. Uterine artery Doppler was evaluated and maternal complications were recorded.

Results: Among the 100 participants, 76 (76%) experienced maternal complications. There were significant differences in resistance index (RI) and pulsatility index (PI) between women who experienced no complications and those who had accidental hemorrhage, HELLP syndrome, and acute pulmonary edema (P<0.001 for all), and postpartum hemorrhage (P=0.004 and P<0.001, respectively). There was no significant difference in RI for women with postpartum fits (P=0.360). There was a statistically significant difference regarding RI (P<0.001) and PI (P=0.005) between cases presenting with complications and those without. There was a significant negative correlation between PI and gestational age (r=-0.988; P<0.001) and between RI and gestational age (r=-0. 854; P<0.001), but no significant correlation between PI or RI and age, systolic blood pressure, or diastolic blood pressure.

Conclusion: Increased uterine artery resistance in the third trimester of pregnancy could be used to predict postpartum maternal complications.

Keywords: Maternal complications; Severe pre-Eclampsia; Uterine artery doppler measurement.

967. Ultrasound Guided Aspiration of Hydrosalpinx Fluid Versus Salpingectomy in the Management of Patients with Ultrasound Visible Hydrosalpinx Undergoing IVF-ET: A Randomized Controlled Trial

Usama M Fouda, Ahmed M Sayed, Hatem I Abdelmoty and Khaled A Elsetohy

Background: The aim of this study was to compare the efficacy of ultrasound guided aspiration of hydrosalpinx fluid at the time of oocyte retrieval with salpingectomy in the management of patients with ultrasound visible hydrosalpinx undergoing IVF-ET.

Methods: One hundred and sixty patients with ultrasound visible hydrosalpinx were randomized into salpingectomy group and aspiration group using computer generated randomization list and sequentially numbered sealed envelopes containing allocation information written on a card.

Results: The clinical pregnancy rate per started cycle and the implantation rate were non- significantly higher in the salpingectomy group compared with the aspiration group [40% vs. 27.5% (p value = 0.132) and 18.95% vs. 12.82% (p value =0.124), respectively]. In the aspiration group, 34.21% of patients had rapid re-accumulation of the hydrosalpinx fluid (i.e. within first two weeks after embryo transfer). Whereas, the clinical pregnancy rate per transfer cycle and the implantation rate were significantly higher in salpingectomy group compared with the subgroup of patients with rapid re-accumulation of hydrosalpinx fluid [42.67% vs. 19.23% (pvalue = 0.036) and 18.95% vs. 7.58% (p value = 0.032), respectively], no significant differences were detected between the salpingectomy group and the subgroup of patients with no re-accumulation of hydrosalpinx fluid (42.67% vs. 34% (p value = 0.356) and 18.95% vs. 15.5% (p value = 0.457), respectively).

Conclusion: The small sample size could be the cause of failure of detecting significant increase in implantation and pregnancy rates in salpingectomy group compared with aspiration group. Further larger randomized controlled trials are needed to determine whether salpingectomy is more effective than aspiration of hydrosalpinx fluid or not. Moreover, the data presented in this study suggested that rapid re-accumulation of hydrosalpinx fluid is an obstacle against successful implantation and the cause of lower success rate with ultrasound guided aspiration of hydrosalpinx fluid compared with salpingectomy.

Keywords: Hydrosalpinx; Salpingectomy; IVF-ET; Infertility; Ultrasound.

968. Menstrual Patterns and Disorders Among Secondary School Adolescents in Egypt. A Cross-Sectional Survey

Hatem I. Abdelmoty, MA Youssef, Shimaa abdallah, Khaled Abdel-Malak, Nawara M. Hashish, Dalia Samir, Moutafa Abdelbar, Ahmed Naguib Hosni, Mohamed Abd-El Ghafar, Yasser Khamis and Mostafa Seleem

Background: To our knowledge, no large population – based studies have been performed on the topic of menstrual patterns among Egyptian adolescent in recent years. The aims of this study were to identify menstrual patterns and associated disorders as well as the sources of menstrual health knowledge among Egyptian adolescents.

Methods: A cross-sectional survey. A total of 800 questionnaires were administered to post-menarcheal Egyptian adolescents attending secondary schools in Giza, Egypt, from September 1, 2012, to December 1, 2013. Participants were asked to respond to a semi-structured questionnaire on menstrual health awareness. The questionnaire included items on girl's socio-demographic and menstrual pattern characteristics, concerning their age at menarche, menstrual cycle length and regularity, duration and amount of flow, type and severity of pain related to menstruation, need for analgesia; and symptoms suggestive of premenstrual syndrome (PMS) Main Outcome Measure: description of menstrual patterns, disorders and source of knowledge.

Results: Four hundred twelve (51.5 %) out of 800 adolescents completed the questionnaire.

The mean age of the girls was 14.67 ± 1.7 years. Mean age at menarche was 12.49 ± 1.20 years. 382 respondents reported various menstrual disorders, giving a prevalence rate of 95 %. Dysmenorrhea was the most prevalent (93 %) menstrual disorder in our sample, followed by PMS (65 %), and abnormal cycle lengths (43 %). Menstrual disorders interfered with social and academic life of 33 and 7.7 % of respondents respectively. Most participants lacked menstrual health knowledge and only 8.9 % of girls reported consulting a physician.

Conclusion: To the best of our knowledge, this is one of the largest studies on menstrual pattern and disorders among Egyptian adolescent girls.

Our Findings of the present study are consistent with other studies and reported higher than expected prevalence of menstrual disorders.

Keywords: Menstrual; Adolescents; Egypt.

Medicine Sector

969. Screening for Chlamydia Trachomatis in Egyptian Women with Unexplained Infertility, Comparing Real-time PCR Techniques to Standard Serology Tests: Case Control Study

Rana M. A. Abdella, Hatem I. Abdelmoaty, Rasha H. Elsherif, Ahmed Mahmoud Sayed, Nadine Alaa Sherif, Hisham M. Gouda, Ahmed El Lithy, Maged Almohamady, Mostafa Abdelbar, Ahmed Naguib Hosni,Ahmed Magdy and Youssef MA

Background: To study the prevalence of Chlamydia infection in women with primary and secondary unexplained infertility using ELISA technique for antibody detection and real time, fully automated PCR for antigen detection and to explore its association with circulating antisperm antibodies (ASA).

Methods: A total of 50 women with unexplained infertility enrolled in this case control study and a control group of 44 infertile women with a known cause of infertility. Endocervical specimens were collected for Chlamydia antigen detection using PCR and serum samples for antibodies detection. Circulating anti-sperm antibodies were detected using sperm antibody Latex Agglutination tests.

Results: The overall prevalence of Chlamydial infection in unexplained infertility cases as detected by both ELISA and PCR was 40 % (20/50). The prevalence of current Chlamydial genital infection as detected by real-time PCR was only 6.0 % (3/50); two of which were also IgM positive. Prevalence of ASA was 6.0 % (3/50); all were sero-negative for anti-C.trachomatis IgM and were PCR negative.

Conclusion: The incidence of Chlamydial infection in Egyptian patients with unexplained infertility is relatively high. In the setting of fertility investigations; screening for anti. C.trachomatis antibodies using ELISA, and treatment of positive cases should be considered. The presence of circulating ASA does not correlate with the presence of old or current Chlamydia infection in women with unexplained infertility.

Keywords: Unexplained infertility; Chlamydia trachomatis; PCR; Antisperm antibodies.

970. Salivary Progesterone and Cervical Length Measurement as Predictors of Spontaneous Preterm Birth

Ahmed M. Maged, Mohamed Mohesen, Ahmed Elhalwagy and Ali Abdelhafiz1

Objective To evaluate the efficacy of salivary progesterone, cervical length measurement in predicting preterm birth (PTB).

Methods: Prospective observational study included 240 pregnant women with gestational age (GA) 26-34 weeks classified into two equal groups; group one are high risk for PTB (those with symptoms of uterine contractions or history of one or more spontaneous preterm delivery or second trimester abortion) and group 2 are controls.

Results: There was a highly significant difference between the two study groups regarding GA at delivery (31.3 ± 3.75 in high risk versus 38.5 ± 1.3 in control), cervical length measured by transvaginal ultrasound (24.7 ± 8.6 in high risk versus 40.1 ± 4.67 in control) and salivary progesterone level (728.9 ± 222.3 in high risk versus 1099.9 ± 189.4 in control; p < 0.001). There was a statistically significant difference between levels of salivary progesterone at different GA among the high risk group (p value 0.035) but not in low risk group (p value 0.492). CL measurement showed a sensitivity of 71.5% with 100% specificity, 100% PPV, 69.97% NPV and accuracy of 83%, while salivary progesterone showed a sensitivity of 84% with 90% specificity, 89.8% PPV, 85.9% NPV and accuracy of 92.2%.

Conclusion: The measurement of both salivary progesterone and cervical length are good predictors for development of PTB.

Keywords: Cervical length; Preterm birth; Salivary progesterone.

971. Could 3D Placental Volume and Perfusion Indices Measured At 11–14 Weeks Predict Occurrence of Preeclampsia in High-risk Pregnant Women?

Nawara Hashish, Ayman Hassan, Aly El-Semary, Rovan Gohar and M. A. F. M.Youssef

Objective Preeclampsia (PE) is a known cause of maternal, fetal and neonatal morbidity and mortality. Thus, evaluation of the predicting value of combining the 3D assessment of placental volume with the assessment of placental perfusion indices through 3D power Doppler (3DPD) at 11-14 weeks in pregnant women at high risk to develop PE could be a suitable screening method.

Methods: 3D assessment of placental volume and 3DPD assessment of placental vascularization indices at 11-13 weeks and uterine artery Doppler scan (RI and PI) at 21-22 weeks were conducted in this prospective case-control study. Their predictive ability for PE was assessed.

Results: One-hundred pregnant women divided into two groups were enrolled in our study. High-risk group (n=50) and control group (n=50). Thirty-eight (76%) patients in the high-risk group and 6.0 (12%) patients in the control group developed PE, respectively. The mean values of placental volume (<0.001), vascularization index (<0.001), vascularization flow index (<0.002) were significantly lower in the high-risk group. Meanwhile, uterine artery RI (0.011) and PI (<0.001) was significantly higher in the study group. Uterine artery PI is negatively correlated with placental volume and vascularization indices (-0.36).

Conclusion: Our findings suggest that 3D placental volume measurement and 3DPD assessment of placental vascular indices in the first trimester has the potential to detect women at risk for subsequent development of PE.

Keywords: Doppler indices; placental volume; preeclampsia.

972. Routine Office Hysteroscopy Prior to ICSI Vs. ICSI Alone in Patients with Normal Transvaginal Ultrasound: A Randomized Controlled Trial

Khaled Ahmed Abdel Aziz Elsetohy, Ahmed H. Askalany, Mohamed Hassan and Zamam Dawood

Background Implantation failure represents a major cause of stress to both clinician and patient undergoing ICSI cycle. Even minor uterine cavity abnormalities, such as endometrial polyps, small submucous myomas, adhesions, and septa are considered to have a negative impact on the chance to conceive through ICSI. Aim This study aimed at assessing the role of using the office hysteroscopy as a routine investigation in improving ICSI pregnancy rates. Methodology ICSI was performed in two groups of infertile women with no abnormality detected in transvaginal ultrasonographic examination, group I: n = 97 and group II: n = 96, women in group I were subjected to hysteroscopic examination before ICSI while group II underwent ICSI without hysteroscopy. Then, ICSI was performed for all subjects of the two study groups with no statistically significant difference (p[0.05) regarding the number of oocytes retrieved and the number of embryo transfer. Then, all subjects were followed up for 3 weeks after embryo transfer for detection of pregnancy by ultrasound.

Results 43.3 % of group I showed abnormal hysteroscopic findings. Group I showed a significantly higher pregnancy rate (70.1 %) than that of group II (45.8 %) (p = 0.001). There is statistically significant association between the use of hysteroscopy prior to ICSI and the rate of pregnancy (OR 2.77, 95 % CI [1.53–5.00]). In addition, hysteroscopy had detected abnormalities in near half of cases whose ultrasound was normal.

Conclusion Routine office hysteroscopy is an essential step for infertility workup before ICSI even in patients with normal TV/US.

Keywords: Hysteroscopy ICSI Pregnancy Rate Intrauterine Complications.

973. The Adjuvant Effect of Metformin and N-Acetylcysteine to Clomiphene Citrate in Induction of Ovulation in Patients with Polycystic Ovary Syndrome

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Gynecological Endocrinology, 31(8): 635-638 (2015) IF: 1.333

Objectives: To assess the adjuvant effect of metformin and N-acetylcysteine (NAC) to clomiphene citrate (CC) in induction of ovulation in Polycystic Ovary Syndrome (PCOS) patients.

Study Design: 120 women with PCOS were randomly divided into three equal groups: group I received CC only, group II received CC plus NAC and group III received CC plus metformin.

Results: There was a significant difference between group II and other two groups regarding average number of ovulatory follicles >18mm (2.25 versus 1.75 and 1.89, respectively), but no significant difference between the three study groups regarding number of intermediate follicles 14-18mm (4, 10 and 4, respectively). There was no significant difference between the three study groups regarding occurrence and laterality of ovulation, pregnancy rate per cycle but a significant difference between group II and other two groups regarding pregnancy rate per patient (20% versus 10% and 10%, respectively, p value 0.05). There was a highly statistically significant difference between group II and other two groups regarding peak endometrial thickness (7.3± 1.1 versus 5.4±0.6 and 5.3±0.6, respectively).

Conclusions: NAC as an adjuvant to CC for induction of ovulation improves ovulation and pregnancy rates in PCOS patients with beneficial impacts on endometrial thickness.

Keywords: Clomiphene citrate; N-acetylcysteine; Polycystic ovary syndrome; Induction of ovulation; Metformin.

974. Oral Antioxidants Supplementation for Women with Unexplained Infertility Undergoing ICSI/IVF: Randomized Controlled Trial

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Human Fertility, 18: 38-42 (2015) IF: 0.909

Objective Good oocyte quality and maturity are important prerequisites for high fertilization and implantation rates in IVF/ICSI treatment cycles. Reactive oxygen species (ROS) are produced within ovarian follicles, especially during the ovulation process, and increased ROS activity may be a cause of impaired oocyte maturation and higher rate of failure of IVF/ICSI cycles.

Study Design: RCT evaluating the effect of antioxidant supplementation on ICSI/IVF outcomes. Two hundred and eighteen women with unexplained subfertility undergoing IVF/ICSI were randomized into two groups. The study group (n = 112) received daily oral antioxidants in the form of multivitamins and minerals (amino acid chelated) while the control group (n = 106) did not. Main outcomes were number of mature metaphase II (MII) oocytes and clinical pregnancy rate.

Results: There were no significant changes between the groups as regards age, BMI, basal FSH, number of mature (MII) oocytes (12.7 ± 9.4 vs. 13.2 ± 8.6, P = 0.7) and clinical pregnancy rate per woman randomized (38% vs. 34%; [OR = 1.2; 95% CI, 0.70-2.11].

Conclusion: Oral antioxidants in the form of a combination of multivitamins and minerals (amino acid chelated) did not improve oocyte quality and pregnancy rates in women with unexplained infertility undergoing IVF/ICSI treatment.

Keywords: Antioxidants; IVF/ICSI; Ovarian stimulation.

975. A Double-blind Randomized Controlled Trial of Two Different Doses of Misoprostol for Cervical Priming Prior to Office Hysteroscopy

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Middle East Fertility Society Journal, 20: 1-5 (2015)

Objective To evaluate and compare the effectiveness of 200 µg vaginal misoprostol vs. 400 µg vaginal misoprostol administrated 3 h prior to office hysteroscopy, in cervical priming. Design: Randomized controlled trial. Setting Outpatient clinic of the Cairo University Hospital, Cairo, Egypt.

Materials and Methods One hundred and thirty-two women scheduled for office hysteroscopy; were randomized into two groups. Patients were divided into two groups: group I; 66 patients received 200 µg vaginal misoprostol and group II; 66 patients received 400 µg vaginal misoprostol. Primary outcome

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was pain score (visual analogue scale). Major outcome measures 400 µg vaginal misoprostol significantly minimized pain score and procedure time, a significant increase in the ease of entry and the patient acceptability was observed in the 400 µg vaginal misoprostol group. Side effects of misoprostol were minor and transient with no statistically significant difference between both groups.

Major **Conclusion**s 400 µg vaginal misoprostol 3 h prior to office hysteroscopy appears to be more effective than 200 µg vaginal misoprostol in facilitating cervical ripening, minimizing pain score and procedure time, without any increase in side effect occurrence.

Keywords: Office hysteroscopy; Misoprostol; Cervical priming.

Dept. of Ophthalmology

976. Is Viscotrabeculotomy Superior to Conventional Trabeculotomy in the Management of Egyptian Infants with Congenital Glaucoma?

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Purpose: The aim of this study was to assess the efficacy of viscotrabeculotomy in the management of congenital glaucoma as compared to conventional trabeculotomy, in Egyptian infants.

Methods: This is a prospective interventional randomized comparative study in which patients with primary congenital glaucoma were randomly allocated to either group A or B; viscotrabeculotomy (VT); and trabeculotomy (T), respectively. Patients were followed up regarding intra-ocular pressure (IOP), cup/disc (C/D) ratio and horizontal corneal diameter (HCD) for 6 months. A probability value (p value) <0.05 was considered significant.

Results: Twenty-one eyes in group A and 20 eyes in group B were enrolled in the study. The mean preoperative IOP was 23.5 and 24.3 mmHg in the VT and T groups, respectively. Postoperatively, IOP dropped at six months to 14.7 and 17 mmHg in the VT and T groups, respectively. That was significant in either group when compared to preoperative IOP, but not significant between both groups at the same point of comparison.

Conclusions: Both techniques were equally effective in the reduction in IOP in the management of congenital glaucoma, but viscotrabeculotomy did not appear to add more benefit to the surgical outcome than classic trabeculotomy.

Keywords: Congenital glaucoma; Egypt; Trabeculotomy; Viscotrabeculectomy.

977. Spectral-domain Optical Coherence Tomography of Preclinical Chloroquine Maculopathy in Egyptian Rheumatoid Arthritis Patients

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Purpose. To evaluate the role of spectral-domain optical coherence tomography (SD-OCT) in early detection of Chloroquine maculopathy in rheumatoid arthritis (RA) patients.

Methods. 40 left eyes of 40 female rheumatoid arthritis patients who received treatment chloroquine for more than one year were recruited in the study. All patients had no symptoms or signs of Chloroquine retinopathy. They were evaluated using SD-OCT, where the Central Foveal Thickness (CFT), parafoveal thickness and perifoveal thickness, average Retinal Nerve Fiber Layer (RNFL) thickness, and Ganglion Cell Complex (GCC) measurements were measured and compared to 40 left eyes of 40 normal females.

Results. The mean CFT was found to be thinner in the Chloroquine group (238.15 μm $\pm$ 22.49) than the normal controls (248.2 μm $\pm$ 19.04), which was statistically significant (*p* value = 0.034). The mean parafoveal thickness was lesser in the Chloroquine group than the control group in all quadrants (*p* value < 0.05). The perifoveal thickness in both groups showed no statistically significant difference (*p* value > 0.05) in all quadrants. No significant difference was detected between the two groups regarding RNFL, GCC, or IS/OS junction.

Conclusions. Preclinical Chloroquine toxicity can lead to early thinning in the central fovea as well as the parafoveal regions that is detected by SD-OCT.

Keywords: Rheumatoid arthritis; Chloroquine; Spectral-domain Oct.

978. Short Term Outcome of Anterior Lamellar Reposition in Treating Trachomatous Trichiasis

Rania A. Ahmed and Sameh H. Abdelbaky

Purpose. To evaluate the outcome of anterior lamellar reposition (ALR) in treating trachomatous trichiasis.

Methods. Patients with trachomatous trichiasis or entropion with short tarsus were treated by ALR between February 2009 and November 2013. This included splitting of the lid margin behind the aberrant lash line to separate the lid lamellae. The anterior lamella was recessed and fixated using 4/0 silk sutures. The extra lashes and their routes were excised. Sutures were removed by the 3rd week and patients completed 6 months of follow-up. Recurrence of =5 lashes was treated by electrolysis.

Results. The study included 752 eyelids (445 patients; 58.4% females, 41.6% males), mean age 53.2 ± 6.9y. 179 (25.1%) lids had entropion while 287 (64.5%) patients had corneal affection. By the third week, 2.66% lid had trichiasis while 30.8% had no rubbing lashes. By the 6th month, 14.9% of lids showed recurrence while 66.1% were completely cured (CI = 0.63-0.69) and 19% had partial success (CI = 0.16-0.21). Abnormal lid appearance persisted in 2.66% and 12.9% required another surgery.

Conclusion. ALR is a good option for treating trachomatous trichiasis especially without cicatricial entropion. Excision of dysplastic lashes is thought to augment the surgical outcome.

Keywords: Trachoma; Trichiasis; Anterior lamellar recession.

979. Evaluation of the Lower Punctum Parameters and Morphology Using Spectral Domain Anterior Segment Optical Coherence Tomography

Riham S. H. M. Allam and Rania A. Ahmed

Purpose. To study features of the lower punctum in normal subjects using spectral domain anterior segment optical coherence tomography (SD AS-OCT).
Methods. Observational cross-sectional study that included 147 punctae (76 subjects). Punctae were evaluated clinically for appearance, position, and size. AS-OCT was used to evaluate the punctal shape, contents, and junction with the vertical canaliculus. Inner and outer diameters as well as depth were measured.
Results. 24 males and 52 females (mean age 44 ± 14.35 y) were included. Lower punctum was perceived by OCT to be an area with an outer diameter (mean 412.16 ± 163 µm), inner diameter (mean 233.67 ± 138.73 µm), and depth (mean 251.7 ± 126.58 µm). The OCT measured outer punctum diameter was significantly less than that measured clinically (*P*: 0.000). Seven major shapes were identified. The junction with the vertical canaliculus was detectable in 44%. Fluid was detected in 34%, one of which had an air bubble; however, 63% of punctae showed no contents and 4% had debris.
Conclusions. AS-OCT can be a useful tool in understanding the anatomy of the punctum and distal lacrimal system as well as tear drainage physiology. Measuring the punctum size may play a role in plugs fitting.
Keywords: Punctum; Anterior segment; Optical coherence tomography; Morphology; In vivo; Diameter.

980. Prevalence of Visual Impairment and Refractive Errors in Children of South Sinai, Egypt

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Ophthalmic Epidemiology, 22 (4): 246-252 (2015) IF: 1.148

Purpose: To assess the prevalence and causes of visual impairment in children of South Sinai, and to evaluate outcomes of rehabilitation programs.
Methods: Population-based, cross-sectional analysis of 2070 healthy school children screened for visual impairment from 2009 through 2010 in cities of South Sinai and their surrounding Bedouin settlements. Visual acuity (VA) was tested using Snellen charts followed by cycloplegic autorefractometry for cases with presenting VA ≤ 6/9. Appropriate eyeglasses were prescribed and VA re-evaluated.
Results: This study included 1047 boys and 1023 girls, mean age 10.7 ± 3.1 years. Visual impairment (uncorrected VA ≤ 6/9) was detected in 29.4% of children, while 2.0% had moderate–severe visual impairment (uncorrected VA ≤ 6/24). There were statistically significant differences in prevalence of visual impairment between the studied cities (p50.05), with the highest prevalence in Abu Redis. Prevalence of visual impairment was significantly higher among girls (p50.05) and those with positive consanguinity (p50.05). Bedouin children showed significantly lower prevalences of visual impairment. Only age was a reliable predictor of visual impairment (odds ratio 0.94, p50.0001). Ophthalmic examination revealed other disorders, e.g. dry eye (4.74%), squint (2.37%), exophthalmos (1.58%) and ptosis (0.79%). VA significantly improved in children who received spectacles (p50.001).
Conclusion: A total of 29.4% of South Sinai children had some form of visual impairment, 90.32% of which comprised refractive errors (mainly astigmatism) which were significantly corrected with eyeglasses. VA screening and correction of refractive errors

are of the utmost importance for ensuring better visual outcomes and improved school performance.
Keywords: Children; Prevalence; Refraction error; School; Visual impairment.

981. Evaluation of Sex Differences in Corneal Hysteresis

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European Journal of Ophthalmology, 25(5): 391-395 (2015) IF: 1.068

Purpose To study sex differences in corneal biomechanical parameters in Egypt as regards to corneal hysteresis (CH), corneal resistance factor (CRF), Goldmann-correlated intraocular pressure (IOPg), and corneal-compensated intraocular pressure (IOPcc).
Methods This is a cross-sectional observational study that includes 350 eyes of 350 normal subjects (175 men and 175 women) who were evaluated using the Reichert ocular response analyzer (ORA) to measure CH, CRF, IOPg, and IOPcc.
Results The mean CH in men was 9.69 ± 2.05 mm Hg (range 5.7-14.6 mm Hg) and in women 10.41 ± 1.65 mm Hg (range 7-14.4 mm Hg) with a p value of 0.00038. The mean CRF in men was 9.54 ± 2.16 mm Hg (range 4.9-14.4 mm Hg) and in women was 10.37 ± 1.71 mm Hg (range 7.3-15.5 mm Hg) with a p value of 0.00008. The mean IOPg in men was 14.78 ± 4.15 mm Hg (range 7.2-26.5 mm Hg) and in women was 15.44 ± 3.3 mm Hg (range 8.6-23.7 mm Hg) with a p value of 0.09. The mean IOPcc in men was 16.2 ± 4.08 mm Hg (range 10.9-28.9 mm Hg) and in women was 15.86 ± 3.41 (range 9.7-24.2 mm Hg) with a p value of 0.4. There was a statistically significant difference between men and women in CH and CRF while IOPg and IOPcc showed no statistically significant difference (p>0.05).
Conclusions There is a statistically significant difference between men and women in CH and CRF, where women show higher values, while no statistically significant difference exists between the groups in IOPg or IOPcc.
Keywords: Corneal-compensated IOP; Corneal hysteresis; Corneal resistance factor; Goldmann-correlated IOP; Sex difference.

982. Surgical Management of Monocular Elevation Deficiency Combined with Inferior Rectus Restriction

Ahmed Awadein and Dina El-Fayoumi

Journal of American Association of Pediatric Ophthalmology and Strabismus, 19: 316-321 (2015) IF: 1.003

Purpose To evaluate the Results of ipsilateral inferior rectus (IR) recession, when performed alone or in combination with contralateral superior rectus (SR) recession in patients with monocular elevation deficiency (MED) and IR tightness.
Methods The medical records of patients with MED and tight IR muscle were retrospectively reviewed. Patients underwent either ipsilateral IR recession alone (IR group) or combined with contralateral SR recession (IR1SR group). Pre- and postoperative ocular motility and alignment and fundus torsion were analyzed. Abnormal head posture was recorded. All patients were followed for at least 6 months.
Results A total of 23 patients were identified. Mean patient age at time of surgery was 9.8 8.7 years (range, 3-45 years). Ten patients underwnet ipsilateral IR recession 5–8 mm; 13 patients, 4 mm ipsilateral IR recession combined with 5–12 mm contralateral

SR recession. Both groups experienced marked improvement in ocular alignment in the primary position (P 5 0.34). However, there was a statistically better ocular alignment in both upgaze (P 5 0.03) and downgaze (P\0.01) in the IR1SR group, with a lower degree of fundus intorsion (P\0.01). An ipsilateral head tilt developed in 70% of patients in the IR group and in 54% of patients in the IR1SR group.

Conclusions In this patient cohort, combined contralateral SR recession with ipsilateral IR recession reduced postoperative IR underaction and achieved better ocular alignment in upgaze and downgaze.

Keywords: Monocular elevation deficiency; Superior rectus recession; Inferior rectus recession; Double levator palsy.

983. Predicting Postoperative Visual Outcomes in Cataract Patients with Maculopathy

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Purpose: To assess the accuracy of the potential acuity meter (PAM) in predicting postcataract surgery visual acuity outcome in patients with healed inactive maculopathies. Study Design: Prospective interventional clinical trial.

Patients and Methods: Patients scheduled for phacoemulsification had preoperative and 1 month postoperative best-corrected visual acuity (BCVA), PAM test, fluorescein angiography, and macular optical coherence tomography. Patients were grouped to following preoperative BCVA: PRE1: 0.29 and better, PRE2: 0.25–0.13, and PRE3: 0.1 or worse; age: G1 <60, G2 = 60–70, and G3 >70 years. PAM accuracy was divided into: Grade 1: Postoperative BCVA =1 or less line error of the PAM score, Grade 2: Between 1 and 2 lines error, and Grade 3: =3 lines or more error.

Results: This study enrolled 57 patients with a mean age of 71.05 ± 6.78 years where 34 were females. There were 21 (36.84%) patients with diabetic maculopathy and 36 (63.16%) with age-related macular degeneration. The mean preoperative BCVA was 0.198 ± 0.12 (0.1–0.5). The mean PAM score was 0.442 ± 0.24 (0.1–1.3). The mean postoperative BCVA was 0.4352 ± 0.19 (0.17–1.00). The PAM score was in Grade 1, 2, and 3 in 46 (80.7%), 54 (94.7%), and 56 (98.2), respectively. There was a highly significant correlation between the PAM score and the postoperative BCVA (P < 0.001, Chi-square test). There was no correlation between the PAM test accuracy and age, gender, diagnosis, and preoperative BCVA (P = 0.661, 0.667, 0. 0.991, 0.833, Chi-square test; respectively).

Conclusion: The PAM is an accurate method of predicting postoperative visual acuity for eyes with nuclear cataracts Grade I and II and inactive maculopathies.

Keywords: Age-related macular degeneration; Best-corrected visual acuity; Cataract surgery; Diabetic maculopathy; Potential acuity meter.

984. Femtosecond Laser-assisted Implantation of Complete Versus Incomplete Rings for Keratoconus Treatment

Mohamed Hosny, Esraa El–Mayah, Mohamed Karim Sidky and Mohamed Anis

Purpose: To compare complete versus incomplete ring implantation for keratoconus correction.

Methods: We investigated 25 eyes of keratoconic patients, of which 15 had femtosecond-assisted MyoRing corneal implantation (Group 1) and 10 had femtosecond-assisted Keraring segments (Group 2). Uncorrected distance visual acuity (UCVA), best corrected distance visual acuity (BCVA), mean K (K m), sphere, topographic cylinder, and corneal asphericity value (Q-value) were measured in all eyes preoperatively and at 4 weeks postoperatively (1 month).

Results: In Group 1, the K m change was -6.15±2.16 D, with a mean change in sphere of 4.45±2.18 D and a mean change in refractive cylinder of 2.32±3 D. UCVA change was -0.57±0.273 logarithm of the minimum angle of resolution (LogMAR), BCVA change was -0.2±0.27 (LogMAR), and the Q-value change was 0.43±2.6. In Group 2, the K m change was -3.15±1.68 D, UCVA change was -0.48±0.37 (LogMAR), BCVA change was -0.09±0.15 (LogMAR), and the Q-value change was 0.5±0.21. Changes in the means did not significantly differ between groups, except for the K m change, which was significantly greater in Group 1 than in Group 2 (P=0.05).

Conclusion: Both complete ring and ring segment implantation are effective for improving corneal and visual parameters in keratoconus. Complete ring implantation may have a greater flattening effect on the anterior corneal surface.

Keywords: Keraring; Myoring; Femtosecond; Keratoconus.

Dept. of Parasitology

985. Molecular Seasonal, Age and Gender Distributions of Cryptosporidium in Diarrhoeic Egyptians: Distinct Endemicity

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Cryptosporidiosis is a worldwide gastrointestinal disease caused by the protozoan Cryptosporidium parasite. It has a broad range of seasonal and age-related prevalence. We aimed to study the molecular prevalence and seasonality of Cryptosporidium over a period of 1 year in a cohort of Egyptian diarrhoeic patients. Stool samples were collected from 865 diarrhoeic patients attending outpatient clinics of Cairo University hospitals, from all age groups over a 12-month period, examined microscopically for faecal Cryptosporidium oocysts by the acid-fast staining method and for copro-DNA detection using nested polymerase chain reaction (nPCR) assays. PCR-positive samples were characterised molecularly by nPCR-restriction fragment length polymorphism (RFLP) to determine Cryptosporidium genotypes. Cryptosporidium copro-DNA was detected in 19.5 % of the collected samples throughout the year, with a major peak in summer (August) and a small rise in spring (April). Infection was mainly C. hominis (95.8 %) followed by C. parvum (3.0 %), affecting all age groups, with predominance in the pre-school age group, and decrease with age. There were statistically significant associations between the detection of Cryptosporidium and season, diarrhoea, patient age and drinking water, while gender, contact with animals and presence of mucus in stool showed no association. Cryptosporidium in diarrhoeic Egyptians was of distinct endemicity, with the bi-model mostly influenced by population dynamics, with a clear high prevalence in pre-school

children and predominating anthroponotic (C. hominis) transmission throughout the year. The obtained Results highlight Cryptosporidium as a water contaminant and an important cause of health problems in Egypt, necessitating further studies of the risk factors.

Keywords: Cryptosporidium; Molecular seasonality; Endimicity.

986. Genomic Instability in Complicated and Uncomplicated Egyptian Schistosomiasis Haematobium Patients

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Background Exploration of genetic changes during active Schistosoma infection is important for anticipation and prevention of chronic sequelae. This study aimed to explore the genomic instability in chromosomal and cellular kinetics in Egyptians suffering from uncomplicated active schistosomiasis haematobium infection in addition to chronic schistosomiasis haematobium cases complicated by bilharzial-associated bladder cancer (BAC).

Results This study was conducted on 46 schistosomiasis haemotobium cases, 22 were active (Viable S. haematobium eggs in urine samples as detected by microscopy) and 24 were chronic complicated with bladder cancer. Three cytogenetic techniques were applied; the first was quantitative nuclear-morphocytometry by means of which the Feulgen-stained nuclei were analyzed for parameters including shape, size, integrated optical-density and nuclear area. The second was Fluorescent In-Situ Hybridization (FISH) for specific p53gene-locus of chromosome 17 and the third technique was karyotyping. Concerning chronic complicated cases, the mea $\pm$ SD of DNA-content in urinary bladder tissue sections was 3.18 ± 0.65. Five samples (20.83%) of bladder tissue sections of chronic complicated cases showed diploid nuclei, 6 urinary bladder tissue samples (25%) were tetraploid, while 13 bladder samples (54.16%) were aneuploid. Epithelial cells of urine samples demonstrated aneuploidy (mean $\pm$ SD=3.74 ± 0.36).Nuclear contents showed high proliferative DNA index in all urinary epithelial cells. In the acute uncomplicated group, nuclear-DNA of urinary epithelial cells was found diploid with mean nuclear-DNA content of 2.2 ± 0.16SD. Half of these diploid smears had a high proliferation index. The difference between nuclear DNA-contents in acute and chronic cases was significant ($P = 0.0001$). FISH technique for specific p53gene-locus and karyotyping were done on urinary bladder tissue specimens and peripheral blood monocytes of 8 chronic cases respectively. Three samples (37.5%) with invasive BAC had a deletion of the p53 gene. Karyotyping showed three cases out of the 8 chronic schistosomiasis haematobium patients with chromosomal fragmentations.

Conclusions DNA morphometry was valuable in detection of gross genetic changes in urothelial tissues. It is an important prognostic factor in established schistosomiasis haematobium induced bladder malignancy. It has the great advantage of being applicable on urine cells making it suitable for the prediction of a tendency towards genetic instability in active schistosomiasis haematobium patients.

Keywords: Schistosomiasis haematobium; Chromosomal abnormalities; Morphocytometry; Fish; Karyotyping.

987. Kasr Al Ainy, the Story of A Palace That Became A Medical School

Nadia A. Eldib

Kasr Al Ainy, the palace built by Ahmed Ibn Al Ainy, in the years (A.D.1466-1468) by the Nile shore in the area known till now as Mouth of Khalig. This palace played an important part in the history of Cairo and Egypt which extends till now.

It was used as a governmental building, a Chateau, a military hospital and a primary school till the year 1837. Mohamed Ali Pasha introduced the European military system in Egypt and wanted to provide it with the medical aid. He assigned Dr. Clot Bey, from France to establish a medical school in Abu Za'abal to prepare doctors for the army in the year 1827. It was after 10 years that the medical school was transferred to Kasr Al Ainy as a medical school and hospital. Kasr Al Ainy witnessed all the changes that occurred in Egypt till now, serving all the Egyptians and non-Egyptians.

Keywords: Ahmed Ibn Al Ainy; Cairo University; Clot Bey; Faculty of Medicine; Kasr Al Ainy; Theodore Bilharse; Mohamed Ali Pasha.

988. Copro Prevalence and Estimated Risk of Entamoeba Histolytica in Diarrheic Patients At Beni-Suef, Egypt

Shimaa S. Ibrahim, Olfat M. El-Matarawy, Marwa A. Ghieth, Enas Y. Abu Sarea and Ayman A. El-Badry

Amoebiasis diagnosis is usually based on microscopy that cannot differentiate pathogenic E. histolytica from morphologically identical non-pathogenic species. 194 fecal samples were collected from diarrheic &/or dysenteric patients and examined for Entamoeba complex microscopically, E. histolytica/E. dispar coproantigen using ICT and E. histolytica coproantigen using Tech lab E. histolytica II ELISA test. Entamoeba complex trophozoites/cysts, E. histolytica/E. dispar coproantigen and E. histolytica coproantigen were detected in 22.2, 14.4 and 3.6 % of samples, respectively.

Microscopy and ICT method had limited sensitivity with poor PPV (9.3 and 7.1 %, respectively) and both slightly agree with ELISA test.

The prevalence of E. histolytica was low (3.6 %) in studied individuals and was 14 times lower than nonpathogenic amoebae. E. histolytica detection studied individuals was positively associated with mucoid and bloody stool, which makes them disease predictors. E. histolytica fecal ELISA assay for E. histolytica detection surpassed microscopy and E. histolytica/E. dispar ICT assay. This has highlighted the need for practical non-microscopic detection Methods that can differentiate between amoeba infections to avoid unnecessary and possibly harmful therapies and to determine the true prevalence and epidemiology of E. histolytica.

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989. Simultaneous Detection of Entamoeba Histolytica/dispar, Giardia Duodenalis and Cryptosporidia By Immunochromatographic Assay in Stool Samples from Patients Living in the Greater Cairo Region, Egypt

Dagmar M. Banisch, Ayman El-Badry, Jorge V. Klinnert, Ralf Ignatius and Nadia El-Dib

Gastrointestinal infection due to intestinal parasites is an enormous health problem in developing countries and its reliable diagnosis is demanding. Therefore, this study aimed at evaluating a commercially available immunochromatographic assay (ICA) for the detection of cryptosporidia, Giardia duodenalis, and Entamoeba histolytica/dispar for its usefulness in the Greater Cairo Region, Egypt. Stool samples of 104 patients who presented between October 2012 and March 2013 with gastrointestinal symptoms or for the exclusion of parasites at Kasr-Al-Ainy University Medical School were examined by light microscopy of wet mounts and the triple ICA. Microscopy revealed in 20 % of the patients [95 % confidence interval (CI), 13.5–29.0 %] parasites with Hymenolepis nana, E. histolytica/dispar and Blastocystis hominis being the most frequent ones, but was not able to detect G. duodenalis and cryptosporidia, whereas ICA was positive in 21 % (95 % CI, 14.3–30.0 %) and detected E. histolytica/dispar in 12.5 % (95 % CI, 7.3–20.4 %), cryptosporidia in 6.7 % (95 % CI, 3.1–13.5 %) and G. duodenalis in 15.4 % (95 % CI, 9.6–23.6 %) of the patients. Detection of one or more pathogens was associated with access to water retrieved from a well or pump (p = 0.01). Patients between 20 and 29 years of age (p = 0.08) and patients with symptoms of 5 days or longer (p = 0.07) tended to have a higher risk to be infected than patients of other age groups or with shorter-lasting symptoms. In Conclusion, the ICA was easy to perform and timesaving. Importantly, it enabled the detection of cryptosporidia, which cannot be found microscopically in unstained smears, demonstrated a higher sensitivity for the detection of G. duodenalis than microscopy, and was more specific for distinguishing E. histolytica/dispar from apathogenic amoeba.

990. Molecular Detection of Capillaria Philippinensis: an Emerging Zoonosis in Egypt

Nadia A. El-Dib, Ayman A. El-Badry, Thuy-Huong Ta-Tang and Jose M. Rubio

Human infection with Capillaria philippinensis is accidental; however, it may end fatally if not diagnosed and treated in the proper time. The first case was detected in the Philippines in 1963, but later reported in other countries around the world, including Egypt. In this report, molecular diagnosis using a specific nested PCR for detection of C. philippinensis in faeces is described based on the amplification of small ribosomal subunit. The test showed sensitivity and specificity, as it detected all the positive cases and gave no cross-reaction with human DNA and DNA of other tested parasites. This method can be very useful not only for improvement of diagnosis, but also to understand the different environmental routes of transmission by detection of C.

philippinensis DNA-stages in the possible fish intermediate hosts and reservoir animal host, helping to improve strategies for surveillance and prevention of human disease.

991. Immunohistochemical Pattern of T Lymphocytes Population Within Bilharzial-Associated Bladder Neoplasm Microenvironment

Amany Ahmed Abd El-Aal, Ashraf Mohamed Emran, Abeer Said Al-Antably, Enas Ali El Saftawy, Ibrahim R Bayoumy, Nabila Salah Hassan and Manal Badawi

The present work aimed to investigate the cellular and immunochemical pattern of T cells population in biopsy material from chronic schistosomiasis haematobium Egyptian patients complicated with bladder cancer. Digital real-time quantitative photocytometry was applied to auto-analyze 29 stained tissue sections from cases and 17 controls using STAT4, GATA3, FOXP3, and CD8 markers specific for Th1, Th2, T regulatory, and T cytotoxic cells, respectively. Area percentage showed significant high level of GATA, followed by FOXP3 and low level of both STAT and CD8 was reported. Tissue samples from five healthy bladder tissues showed significant lower optical density (OD) values. Tissue samples from 12 non-bilharzial bladder cancers showed variable OD values, reflecting wide disparity in the control group. Our Results hypothesized an exclusive pattern of T population in long standing complicated schistosomiasis haematobium. Our cases were poorly controlled by unbalanced Th1/Th2 in which Th2 was dominated. FOXP3 increased significantly, however, failed to downregulate Th2, instead, the relation between Th1 and T cytotoxic was forcibly limited by the high level of FOXP3, resulting in loss of their power in defending the host against both parasite and carcinogenic changes. These Results provide more clarification for the immune evasion process played by the parasite and tumor cells under the supervision of T regulatory cells. Additionally a critical role of FOXP3 is suggested in manipulating STAT4 and CD8 in favor of malignant transformation in this life-threatening parasite.

992. Clinical and Laboratory Investigations of Cases Infected with Capillaria Philippinensis in Beni-Suef Governorate, Egypt

Fadia Mohamed Anwar Amin, Nadia Aly El-Dib, Enas Yahia Abu-Sarea Mohamed and Mona Ebrahim Aly

Capillaria philippinensis is a zoonotic intestinal parasite that emerged in the 1960s in the Philippines and appeared later causing emerging infection in Egypt. The disease caused by C. philippinensis is frequently fatal if not diagnosed and treated early and correctly. In the present study, detection of this parasite was done in Beni-Suef University Hospital by using clinical and laboratory investigations. The study was conducted from January

2010 to May 2011 and reported eight female cases of intestinal capillariasis out of 160 patients presented with chronic diarrhea and other gastrointestinal symptoms.

Keywords: Intestinal capillariasis; Chronic diarrhea; Prevalence of C; Philippinensis; Diagnosis of C. Philippinensis.

Dept. of Pediatrics

993. Mutations in TRAF3IP1/IFT54 Reveal A New Role for IFT Proteins in Microtubule Stabilization

Albane A. Bizet, Anita Becker-Heck, Rebecca Ryan, Kristina Weber, Emilie Filhol, Pauline Krug, Jan Halbritter, Marion Delous, Marie-Christine Lasbennes, Bolan Linghu, Edward J. Oakeley, Mohammed Zarhrate, Patrick Nitschke´, Meriem Garfa-Traore, Fabrizio Serluca, Fan Yang, Tewis Bouwmeester, Lucile Pinson, Elisabeth Cassuto, Philippe Dubot, Neveen A.Soliman Elshakhs, Jose´ A. Sahel, Re´mi Salomon, Iain A. Drummond, Marie-Claire Gubler, Corinne Antignac, Salahdine Chibout, Joseph D. Szustakowski, Friedhelm Hildebrandt, Esben Lorentzen, Andreas W. Sailer, Alexandre Benmerah, Pierre Saint-Mezard and Sophie Saunier

Ciliopathies are a large group of clinically and genetically heterogeneous disorders caused by defects in primary cilia. Here we identified mutations in TRAF3IP1 (TNF Receptor-Associated Factor Interacting Protein 1) in eight patients from five families with nephronophthisis (NPH) and retinal degeneration, two of the most common manifestations of ciliopathies. TRAF3IP1 encodes IFT54, a subunit of the IFT-B complex required for ciliogenesis. The identified mutations result in mild ciliary defects in patients but also reveal an unexpected role of IFT54 as a negative regulator of microtubule stability via MAP4 (microtubule-associated protein 4). Microtubule defects are associated with altered epithelialization/polarity in renal cells and with pronephric cysts and microphthalmia in zebrafish embryos. Our findings highlight the regulation of cytoplasmic microtubule dynamics as a role of the IFT54 protein beyond the cilium, contributing to the development of NPH-related ciliopathies.

Keywords: Ciliopathies; TNF Receptor-associated factor interacting protein 1 (TRAF3IP1); Nephronophthisis (NPH); Ciliary functions.

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994. Effects of Deferasirox-Deferoxamine on Myocardial and Liver Iron in Patients with Severe Transfusional Iron Overload

Yesim Aydinok, Antonis Kattamis, M. Domenica Cappellini, Amal El-Beshlawy, Raffaella Origa, Mohsen Elalfy, Yurdanur Kilinc, Silverio Perrotta, Zeynep Karakas, Vip Viprakasit, Dany Habr, Niculae Constantinovici, Junwu Shen and John B. Porter

Deferasirox (DFX) monotherapy is effective for reducing myocardial and liver iron concentrations (LIC), although some patients may require intensive chelation for a limited duration. HYPERION, an open-label single-arm prospective phase 2 study, evaluated combination DFX-deferoxamine (DFO) in patients with severe transfusional myocardial siderosis (myocardial [m] T2* 5-<10 ms; left ventricular ejection fraction [LVEF] =56%) followed by optional switch to DFX monotherapy when achieving mT2* >10 ms. Mean dose was 30.5 mg/kg per day DFX and 36.3 mg/kg per day DFO on a 5-day regimen. Geometric mean mT2* ratios (Gmeanmonth12/24/Gmeanbaseline) were 1.09 and 1.30, respectively, increasing from 7.2 ms at baseline (n = 60) to 7.7 ms at 12 (n = 52) and 9.5 ms at 24 months (n = 36). Patients (17 of 60; 28.3%) achieved mT2* =10 ms and =10% increase from baseline at month 24; 15 switched to monotherapy during the study based on favorable mT2*. LIC decreased substantially from a baseline of 33.4 to 12.8 mg Fe/g dry weight at month 24 (-52%). LVEF remained stable with no new arrhythmias/cardiac failure. Five patients discontinued with mT2* <5 ms and 1 died (suspected central nervous system infection). Safety was consistent with established monotherapies.

Results show clinically meaningful improvements in mT2* in about one-third of patients remaining on treatment at month 24, alongside rapid decreases in LIC in this heavily iron-overloaded, difficult-to-treat population. Combination therapy may be useful when rapid LIC reduction is required, regardless of myocardial iron overload.

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995. Cinacalcet in Pediatric and Adolescent Chronic Kidney Disease A Single-center Experience

Abdulla A. Alharthi, Naglaa M. Kamal, Mohamed W. Abukhatwah and Laila M. Sherief

Cinacalcet, a calcimimetic drug, has been shown to be efficacious in adult chronic kidney disease (CKD) patients; however, it was not fully studied in pediatric CKD patients. We aimed at assessing the effect of cinacalcet on intact parathyroid hormone (iPTH) secretion in children with CKD-4/5 with iPTH consistently = 300 pg/mL refractory to conventional treatment. This is a prospective cohort analysis of 28 children with uncontrolled hyper-parathyroidism secondary to stage 4 and 5 CKD admitted to a tertiary center during the period from April 2012 to April 2014. Twenty-eight patients with CKD-4/5 were assessed prospectively regarding bone biochemistry, renal ultrasonography, serum iPTH level, and medications. Patients were classified into 3 groups:

group 1, 6 patients with CKD-4 on supplemental and supportive therapy; group 2, 6 patients with CKD-5 on hemodialysis and; group 3, 16 patients with CKD-5 on automated peritoneal dialysis. Patients were between the ages of 9 months and 18 years on commencing cinacalcet at doses of 0.5 to 1.5 mg/kg. All patients showed at least a 60% reduction in iPTH (60%-97%).

Highly significant reduction in iPTH and serum alkaline phosphatase levels was detected post-cinacalcet. The serum calcium (Ca), phosphate (P), and Ca × P product were unaffected. Treatment was well tolerated with no hypophosphatemia, hypocalcemia, or other adverse effects almost in all patients. Cinacalcet use was proven safe for all pediatric and adolescent patients with CKD-4/5 during the study period, and at the same time most of the patients reached the suggested iPTH target values.

Keywords: Cinacalcet; Pediatric; Adolescent; Chronic kidney disease.

Medicine Sector

996. Renal Presentation in Pediatric Acute Leukemia
Report of 2 Cases

Laila M. Sherief, Seham F. Azab, Marwa M. Zakaria, M. Kamal, Maha Abd Elbasset Aly, Adel Ali and Mohamed Abd Alhady

Medicine, 94(37): 1-4 (2015) IF: 5.723

Renal enlargement at time of diagnosis of acute leukemia is very unusual. We here in report 2 pediatric cases of acute leukemia who had their renal affection as the first presenting symptom with no evidences of blast cells in blood smear and none of classical presentation of acute leukemia. The first case is a 4-year-old girl who presented with pallor and abdominal enlargement. Magnetic resonance imaging showed bilateral symmetrical homogenous enlarged kidneys suggestive of infiltration. Complete blood picture (CBC) revealed white blood count 11×10^9/L, hemoglobin 8.7 g/dL and platelet count 197×10^9/L. Bone marrow aspiration was performed, and diagnosed precursor B-cell ALL was made. The child had an excellent response to modified CCG 1991 standard risk protocol of chemotherapy with sustained remission, but unfortunately relapsed 11 month after the end of therapy. The second child was 13-month old, presented with pallor, vomiting, abdominal enlargement, and oliguria 2 days before admission. Initial CBC showed bicytopenia, elevated blood urea, creatinine, and serum uric acid, while abdominal ultrasonography revealed bilateral renal enlargement. Bone marrow examination was done and showed 92% blast of biphenotypic nature. So, biphynotypic leukemia with bilateral renal enlargement and acute renal failure was subsequently diagnosed. The patients admitted to ICU and received supportive care and prednisolone. Renal function normalized and chemotherapy was started. The child achieved complete remission with marked reduction of kidney size but, unfortunately she died from sepsis in consolidation phase of therapy. This case demonstrates an unusual early renal enlargement in childhood acute leukemia. Renal involvement of acute leukemia should be considered in child presenting with unexplained bilateral renal enlargement with or without renal function abnormalities and bone marrow examination should be included in the workup.
Keywords: Renal presentation; Pediatric; Acute leukemia; Egypt.

997. Cadmium Status Among Pediatric Cancer Patients in Egypt

Laila M. Sherief, Elhamy R. Abdelkhalek, Amal F. Gharieb, Hanan S. Sherbiny, Doaa M. Usef, Mohamed A.A. Almalky, Naglaa M. Kamal, Mostafa A. Salama and Wafaa Gohar

Medicine, 94(20): 1-6 (2015) IF: 5.723

Cadmium (Cd) is a toxic, nonessential, and bio-accumulating heavy metal widely used in industry. Several studies have suggested a positive association between Cd exposure and risks of several cancers. However, data from general population, especially children are sparse.In the current cross-sectional case-control study, we aimed to assess the association between Cd exposure, as expressed by Cd body status (blood, urine, scalp hair, and nails) and cancer among Egyptian children. Three hundred and fifty pediatric cancer cases aged 3 to 14-years old were enrolled in our study. Their body Cd levels were evaluated using Atomic Absorption Spectrometer and were compared with Cd levels of 350 healthy children.Significantly higher Cd levels (blood, urine, scalp hair, and nails) were documented in

cancer cases when compared with control (P<0.001). Such difference was still detected when comparing each malignant type separately, with controls. Tobacco smoke exposure, rural residence, and low socioeconomic status were reported more frequently among cases than comparisons.Positive association between Cd exposure and pediatric malignancy may be present.
Keywords: Cadmium; Pediatric; Cancer; Egypt.

998. Hodgkin Lymphoma in Childhood: Clinicopathological Features and Therapy Outcome at 2 Centers from A Developing Country

Laila M. Sherief, Usama R. Elsafy, Elhamy R. Abdelkhalek, Naglaa M. Kamal, Rabab Elbehedy, Tamer H. Hassan, Hanan S. Sherbiny, Mohamed R. Beshir and Safaa H. Saleh

Medicine, 94(15): 1-7 (2015) IF: 5.723

Hodgkin lymphoma (HL) accounts for 5% to 6% of all childhood cancer. It displays characteristic epidemiological, clinical, and pathological features according to various geographic areas. We aimed to assess the epidemiological aspects, clinicopathological features, and treatment outcome of pediatric HL treated at 2 Egyptian centers: Zagazig University Pediatric Oncology Unit and Benha Special Hospital Pediatric Oncology Unit. We carried a cross-sectional retrospective study by reviewing medical records for all patients admitted with the diagnosis of HL over 8 years in 2 oncology units during the period from January 2004 to January 2012. Age of the patients at presentation ranged from 3 to 14 years (median 6 years) and male: female ratio 1.7:1. Lymphadenopathy was the most common presentation (96.6%). Mixed cellularity subtype was dominant (50.8%), followed by nodular sclerosis (28.9%), lymphocyte-rich (18.6%) with lymphocyte depletion being the least dominant (1.7%). More than half of patients (55.9 %) had advanced disease (Ann Arbor stage III/IV disease). The duration of follow-up ranged from 5 to 87 months (mean 39.8±24.1 months). The 5-year overall survival and event-free survival for patients were 96.6% and 84.7% respectively. In Egypt, HL occurs in young age group, with a higher incidence of mixed cellularity subtype and advanced disease. None of the clinical, epidemiological, or pathological characteristics had a significant association with the overall survival. The outcomes of HL in our 2 centers were satisfactory approaching the international percentage.
Keywords: Hodgkin lymphoma; Childhood; Clinicopathological features; Therapy outcome; Developing country.

999. Psychological Impact of Chemotherapy for Childhood Acute Lymphoblastic Leukemia on Patients and their Parents

Laila M. Sherief, Naglaa M. Kamal, Hadel M. Abdalrahman, Doaa M. Youssef, Mohamed A Abd Alhady, Adel SA Ali, Maha Aly Abd Elbasset and Hiatham M. Hashim

Medicine, 94(51): 1-6 (2015) IF: 5.723

To assess the self-esteem of pediatric patients on chemotherapy for acute lymphoblastic leukemia (ALL) and psychological status of their parents.The psychological status of 178 children receiving chemotherapy for ALL and their parents was assessed using parenting stress index (PSI) to determine the degree of stress the parents are exposed to using parent's and child's domains. Self-

esteem Scale was used to determine the psychological status of patients.The study revealed significant low level of self-esteem in 84.83% of patients. Their parents had significant psychological stress. PSI was significantly associated with parents' low sense of competence, negative attachment to their children, feeling of high restriction, high depression, poor relation to spouse, high social isolation variables of parent's domains. It was significantly associated with low distraction, negative parents' reinforcement, low acceptability, and high demanding variables of child's domains. Long duration of disease was the most detrimental factor among demographic data of the patients.Chemotherapy for ALL has a significant impact on the psychological status of both patients and their parents with high prevalence of low self-esteem in children and high degree of stress in their parents.

Keywords: Psychological impact of chemotherapy; Childhood; Acute lymphoblastic leukemia; Patients; Parents; Egypt.

1000. Pediatric Online Evidence-Based Medicine Assignment is A Novel Effective Enjoyable Undergraduate Medical Teaching Tool
A Squire Compliant Study

Magd A. Kotb, Hesham Nabeh Elmahdy, Nour El Deen Mahmoud Khalifa, Mohamed Hamed Nasr El-Deen and Mohamed Amr N. Lotfi

Evidence-based medicine (EBM) is delivered through a didactic, blended learning, and mixed models. Students are supposed to construct an answerable question in PICO (patient, intervention, comparison, and outcome) framework, acquire evidence through search of literature, appraise evidence, apply it to the clinical case scenario, and assess the evidence in relation to clinical context. Yet these teaching models have limitations especially those related to group work, for example, handling uncooperative students, students who fail to contribute, students who domineer, students who have personal conflict, their impact upon progress of their groups, and inconsistent individual acquisition of required skills. At Pediatrics Department, Faculty of Medicine, Cairo University, we designed a novel undergraduate pediatric EBM assignment online system to overcome shortcomings of previous didactic method and aimed to assess its effectiveness by prospective follow-up during academic years 2012 to 2013 and 2013 to 2014. The novel web-based online interactive system was tailored to provide sequential single and group assignments for each student. Single assignment addressed a specific case scenario question, while group assignment was teamwork that addressed different questions of same case scenario. Assignment comprised scholar content and skills. We objectively analyzed students' performance by criterion-based assessment and subjectively by anonymous student questionnaire. A total of 2879 were enrolled in 5th year Pediatrics Course consecutively, of them 2779 (96.5%) logged in and 2554 (88.7%) submitted their work. They were randomly assigned to 292 groups. A total of 2277 (89.15%) achieved >=80% of total mark (4/5), of them 717 (28.1%) achieved a full mark. A total of 2178 (85.27%) and 2359 (92.36%) made evidence-based Conclusions and recommendations in single and group assignment, respectively (P < 0.001). A total of 1102 (43.1%) answered student questionnaire, of them 898 (81.48%) found e-educational experience satisfactory, 175 (15.88%) disagreed, and 29 (2.6%) could not decide. A total of 964 (87.47%) found single assignment educational, 913 (82.84%) found group assignment educational, and 794 (72.3%) enjoyed it. Web-based online interactive undergraduate EBM assignment was found effective in teaching medical students and assured individual student acquisition of concepts and skills of pediatric EMB. It was effective in mass education, data collection, and storage essential for system and student assessment.

Keywords: Pediatric online evidence-based medicine assignment; Medical education; Self education.

1001. Folic Acid Intake and Neural Tube Defects: Two Egyptian Centers Experience

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Neural tube defects (NTDs) are a group of congenital malformations with worldwide distribution and complex etiopathogenesis. Folic acid plays a pivotal role in their prevention. We aimed to identify the protective effect of folic acid intake against NTDs and its dependence on different socioeconomic and environmental factors in a cohort of mothers in Egypt. A cross-sectional study was carried over a period of 12 months on mothers who gave birth to babies with NTDs (group 1) and a control group with healthy offsprings (group 2). Both groups completed 2 questionnaires: food frequency questionnaire targeting the daily folate intake, and socioeconomic status and medical history questionnaire. Both groups of mothers received folate <800 µg/day, recommended for pregnant women. A strong association was detected between NTDs and urban residency with medium educated mothers, with negative consanguinity, who had folate intake < 400 µg daily, and who had their food long cooked. Each of these factors separately had a limited impact to cause NTDs, but when present together they did augment each other. Interestingly enough is the role of fava bean, cauliflower, spinach, and mango in predisposing of NTDs in the presence of the above-mentioned factors. The protective effect of folic acid intake against NTDs may depend on the synergism of different socioeconomic and environmental factors (which differ from country to another). In Egypt, females especially the medium-educated who live in urban areas should be well-informed with the value of folate intake in the periconceptional period.

Keywords: NTDs; Neural tube defects, RDA; Recommended daily allowance, USDA; U.S. department of agriculture; FDA; Food and drug administration.

1002. Mutations of the SLIT2–ROBO2 pathway genes SLIT2 and SRGAP1 Confer Risk for Congenital Anomalies of the Kidney and Urinary Tract

Daw‑Yang Hwang, Stefan Kohl, Xueping Fan, Asaf Vivante, Stefanie Chan, Gabriel C. Dworschak, Julian Schulz, Albertien M. van Eerde, Alina C. Hilger, Heon Yung Gee, Tracie Pennimpede, Bernhard G. Herrmann, Glenn van de Hoek, Kirsten Y. Renkema, Christoph Schell, Tobias B. Huber, Heiko M. Reutter, Neveen A. Soliman, Natasa Stajic, Radovan Bogdanovic, Elijah O. Kehinde, Richard P. Lifton, Velibor Tasic, Weining Lu and Friedhelm Hildebrandt

Congenital anomalies of the kidney and urinary tract (CAKUT) account for 40-50% of chronic kidney disease that manifests in the first two decades of life. Thus far, 31 monogenic causes of isolated CAKUT have been described, explaining ~12% of cases. To identify additional CAKUT-causing genes, we performed whole-exome sequencing followed by a genetic burden analysis in 26 genetically unsolved families with CAKUT. We identified two heterozygous mutations in SRGAP1 in 2 unrelated families. SRGAP1 is a small GTPase-activating protein in the SLIT2-ROBO2 signaling pathway, which is essential for development of the metanephric kidney. We then examined the pathway-derived candidate gene SLIT2 for mutations in cohort of 749 individuals with CAKUT and we identified 3 unrelated individuals with heterozygous mutations. The clinical phenotypes of individuals with mutations in SLIT2 or SRGAP1 were cystic dysplastic kidneys, unilateral renal agenesis, and duplicated collecting system. We show that SRGAP1 is expressed in early mouse nephrogenic mesenchyme and that it is coexpressed with ROBO2 in SIX2-positive nephron progenitor cells of the cap mesenchyme in developing rat kidney. We demonstrate that the newly identified mutations in SRGAP1 lead to an augmented inhibition of RAC1 in cultured human embryonic kidney cells and that the SLIT2 mutations compromise the ability of the SLIT2 ligand to inhibit cell migration. Thus, we report on two novel candidate genes for causing monogenic isolated CAKUT in humans.
Keywords: Congenital anomalies of the kidney and urinary tract cakut; Genetic mutations; Cakut-causing genes.

1003. Sustained Improvements in Myocardial T2* Over 2 Years in Severely Iron-overloaded Patients with Beta Thalassemia Major Treated with Deferasirox or Deferoxamine

Dudley J. Pennell, John B. Porter, Antonio Piga, Yong-Rong Lai, Amal El-Beshlawy, Mohsen Elalfy, Akif Yesilipek, Yurdanur Kilinc, Dany Habr, Khaled M. Musallam, Junwu Shen and Yesim Aydinok

Long-term controlled studies are needed to inform on the clinical benefit of chelation therapy for myocardial iron removal in transfusion-dependent beta thalassemia patients. In a 1-year nonrandomized extension to the CORDELIA study, data collected from patients with myocardial siderosis provided additional information on deferasirox or deferoxamine (DFO) efficacy and safety. Myocardial (m)T2* increased from baseline 11.6 to 15.9 ms in patients receiving deferasirox for 24 months (n 5 74; geometric mean [Gmean] ratio of month 24/baseline 1.38 [95% confidence interval 1.28, 1.49]) and from 10.8 to 14.2 ms in those receiving DFO (n 5 29; Gmean ratio 1.33 [1.13, 1.55]; P 5 0.93 between groups). Improved mT2* with deferasirox was evident across all subgroups evaluated irrespective of baseline myocardial (mT2* < 10 vs. 10 ms) or liver (LIC <15 vs. 15 mg Fe/g dw) iron burden. Mean LVEF was stable and remained within normal limits with deferasirox or DFO. Liver iron concentration decreased from high baseline values of 30.6 6 18.0 to 14.4 6 16.6 mg Fe/g dw at month 24 in deferasirox patients and from 36.8 6 15.6 to 11.0 6 12.1 mg Fe/g dw in DFO patients. The long-term safety profile of deferasirox or DFO was consistent with previous reports; serious drug-related AEs were reported in 6.8% of deferasirox and 6.9% of DFO patients. Continued treatment of severely iron-overloaded beta thalassemia patients with deferasirox or DFO led to sustained improvements in myocardial iron irrespective of high or low baseline myocardial or liver iron burden, in parallel with substantial improvements in liver iron.
Keywords: Deferasirox or deferoxamine; Myocardial T2*; Iron overload.

1004. Targeting E2F1 and c-Myc Expression by microRNA-17-5p Represses Interferon-stimulated Gene MxA in Peripheral Blood Mononuclear Cells of Pediatric Systemic Lupus Erythematosus Patients

Rola Ahmed Sarhan, Heba Ragaee Abdelhakam Aboelenein, Shady Karim Nasry Sourour, Injie Omar Fawzy, Samia Salah and Ahmed Ihab Abdelaziz

Objectives: Elevated type I interferon (IFN) is believed to be one of the crucial factors involved in the pathogenesis of systemic lupus erythematosus (SLE). Its expression was recently found to be governed by the transcription factor E2F1 which is involved in an autoregulatory triad along with c-Myc and the microRNA polycistron miR-17- 92. However, this intricate triad has seldom been investigated in SLE patients. Therefore, the current study was undertaken to investigate the expression pattern of the E2F1/c-Myc/miR-17-5p triad in peripheral blood of SLE patients as well as to examine the impact of manipulating this triad using miR- 17-5p mimics and inhibitors on IFN signature in SLE patients.
Methods: Expression of the E2F1/cMyc/miR-17-5p triad and the IFN-stimulated gene MxA was analyzed using real time qPCR. Peripheral blood mononuclear cells from SLE patients and controls were transfected with miR-17- 5p mimics and antagomirs using the HiPerfect transfection reagent.
Results: E2F1 transcripts and miR-17-5p were significantly downregulated while c-Myc and MxA transcripts were significantly upregulated in SLE. Also, transfection of SLE PBMCs with miR-17-5p mimics led to a substantial repression of E2F1 and c-Myc expression. The overall change in this triad upon miR-17-5p mimicking resulted in lowering the transcript levels of the IFNinducible gene MxA in SLE.
Conclusion: This may advocate the manipulation/use of the E2F1/cMyc/miR-17-5p trinity to effectively control the aberrantly high levels of type I IFN activity in lupus patients
Keywords: microRNA-17-5P; Lupus patients.

1005. Left Ventricular Systolic Dysfunction in Asymptomatic Marfan Syndrome Patients is Related to the Severity of Gene Mutation: Insights from the Novel three Dimensional Speckle Tracking Echocardiography

Mohamed youssef mohamed abd El-Rahman

Background: In asymptomatic Marfan syndrome (MFS) patients we evaluated the relationship between the types of fibrillin-1 (FBN1) gene mutation and possible altered left ventricular (LV) function as assessed by three-dimensional speckle tracking echocardiography (3D-STE).

Methods and Results: Forty-five MFS patients (mean age 24 ± 15 years) and 40 age-matched healthy controls were studied. Genetic evaluation for the FBN1 gene was carried on 32 MFS patients. Gene mutation (n = 15, 47%) was classified as mild when the mutation resulted in nearly normally functioning protein, while mutations resulting in abnormally function protein were considered to be severe (n = 17, 53%). All patients and controls underwent 3D-STE for evaluation of LV function by an echocardiographer blinded to the Results of the genetic testing. Compared to controls, MFS patients had significantly lower 3D-STE derived LV ejection fraction (EF, 57.43 ± 7.51 vs. 62.69 ± 4.76%, p = 0.0001), global LV longitudinal strain (LS, 14.85 ± 2.89 vs. 17.90 ± 2.01%, p = 0.0001), global LV circumferential strain (CS, 13.93 ± 2.81 vs. 16.82 ± 2.17%, p = 0.0001) and global LV area strain (AS, 25.76 ± 4.43 vs. 30.51 ± 2.61%, p = 0.0001). Apart from the global LV LS all these parameters were significantly lower in patients with severe gene mutation than in those with mild mutation (p < 0.05). In the multivariate linear regression analysis only the type of mutation had a significant influence on the 3D-STE derived LVEF (p = 0.017), global CS (p = 0.005) and global AS (p = 0.03).

Conclusions: In asymptomatic MFS patients latent LV dysfunction can be detected using 3D STE. The LV dysfunction is mainly related to the severity of gene mutation, suggesting possible primary cardiomyopathy in MFS patients.

Keywords: Marfan syndrome; Three dimensional speckle tracking echocardiography; Gene mutation.

1006. Really Good Stuff, Introduction

M Brownell Anderson, Lara Varpio, Gabrielle Finn and Ilham Youssry

In 2013, Medical Education began sponsoring an opportunity for individuals involved in the field to participate in a yearlong editorial internship programme.1 As in the first year of the programme, interns work with the editor and deputy editors of the journal to learn about the review and publication process for scholarly articles. I have had the good fortune this year to work with three talented individuals during the course of reviewing and compiling the current issue of 'Really Good Stuff' (RGS). I have asked each of them to provide their insights and reflections about the process in the paragraphs that follow. I have edited their comments slightly so that their separate remarks read well together, but did not have to change much. Although I gave them a tiny bit of guidance outlining what I hoped they would cover in their comments, I was happily surprised by the different approaches to presenting their experience with RGS taken by each of the women, and the fact that each highlights the importance of providing clarity while being brief. The insights they gained from the process of editing the RGS reports provide valuable suggestions for authors and reviewers of this unique section, which complement the advice given by last year's interns.2 I enjoyed greatly the opportunity to work with the interns and hope they found the experience useful and maybe even fun. I would be remiss if I did not acknowledge and thank Lara, Gabrielle and Ilham for supporting one another and truly working as a team to accomplish their task, and for responding on time to every deadline I imposed! I know I learned a great deal from them and I believe you will too.

1007. Selenium and Vitamin E as Antioxidants in Chronic Hemolytic Anemia: Are they Deficient? A Case-control Study in A Group of Egyptian Children

Mona M. Hamdy, Dalia S. Mosallam, Alaa M. Jamal and Walaa A. Rabie

Accelerated oxidative damage is one of the hallmarks in both sickle cell disease (SCD) and thalassemia major (TM). A decreased antioxidant level is found in both diseases. Our study was carried out to evaluate the variation in serum levels of Selenium and Vitamin E among a group of transfusion dependant Egyptian SCD and TM patients, further more to correlate these levels with iron overload status or transfusion requirements. A case-control study was conducted at the Cairo University Pediatric Hospital to assess the serum levels of Selenium using Atomic Absorption Spectrometer and Vitamin E using commercially available ELISA Kit in transfusion dependent children, 30 with beta thalassemia and 30 with SCD in a steady state aged from 6 to 18 years, these findings were compared to 30 age/sex matched healthy controls. Our Results revealed a depleted antioxidants level in the studied group of Egyptian children with TM and SCD relative to healthy controls (P < 0.05). A significant positive correlation was found between Vitamin E levels and ferritin (r = 0.26, p = 0.047) in SCD and TM patients. Nonsignificant correlation was detected between serum Selenium and Vitamin E. Moreover, values of these antioxidants did not correlate with indices of hemolysis nor with those of inflammation in chronically transfused TM and SCD patients.

Keywords: Antioxidants; Vitamin E; Selenium; Sickle cell anemia; β-Thalassemia; Egyptian children.

1008. Novel Marker for the Detection of Sickle Cell Nephropathy: Soluble FMS-like Tyrosine Kinase-1 (sFLT-1)

Ilham Youssry, Samuel Makar, Rania Fawzy, Manal Wilson, Ghada AbdAllah, Eman Fathy and Happy Sawires

Background Given the burden and poor outcome of end-stage renal disease in sickle cell disease (SCD), early markers of sickle cell nephropathy (SN) are desirable. Disordered angiogenesis underlies many complications of SCD. We aimed to determine the relationship between serum FMS-like tyrosine kinase-1 (sFLT-1) and other biomarkers of renal damage for the early diagnosis of SN.

Methods Forty-seven SCD patients and 49 healthy controls were enrolled. Microalbuminuria was determined in patient urine samples. Blood samples were tested for sFLT-1, serum creatinine, and various hemolysis and inflammation markers.Peripheral blood monocyte expression of sFLT-1 was measured using real-time polymerase chain reaction (PCR).

Results The serum level of sFLT-1 (pg/ml) in SCD patients was higher than controls (median/range/IQR=142/ 60–1300/ 61 pg/ml vs. 125/ 110–187/52 pg/ml, respectively) (p=0.006). Median (range) of sFLT-1 level was higher in SCD patients with microalbuminuria compared to SCD patients with normoalbuminuria, 185 (140–1300) vs. 125 (60–189) mg/g, respectively) (p=0.004). There was a significant positive correlation between serum sFLT-1 and microalbuminuria, lactate

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dehydrogenase (LDH), and indirect bilirubin (r=0.59, 0.39,0.30, and p=<0.001, 0.007, 0.041, respectively). sFLT-1 sensitivity in early detection of renal affection in SCD was 93.6 %, while specificity was 68.6 %. Finally, peripheral blood monocytes (PBM) sFLT-1 expression was significantly higher in SCD patients compared to controls (p=0.05).

Conclusions sFLT-1 may contribute to pathogenesis of albuminuria in SCD patients and constitute a novel renal biomarker of SN.

Keywords: Sickle cell disease; Microalbuminuria; Soluble fms-like tyrosine kinase; Sickle cell nephropathy.

1009. Extrahepatic Portal Vein Obstruction in Egyptian Children

Hanaa M. El-Karaksy, Nehal El-Koofy, Nabil Mohsen, Heba Helmy, Nevian Nabil and Mortada El-Shabrawi

Journal of Pediatric Gastroenterology and Nutrition, 60: 105-109 (2015) IF: 2.625

Background and Aim: Extrahepatic portal vein obstruction (EHPVO) is an important cause of portal hypertension in children. The aim of this study was to describe the clinical presentation, possible risk factors, upper gastrointestinal endoscopic findings, and treatment modalities of children with EHPVO.

Methods: After ethical approval of our study protocol by our institution review board, we analyzed available data from medical records of patients with EHPVO presenting to the Pediatric Hepatology Unit, Cairo University Pediatric Hospital, Egypt, for a period of 15 years from January 1996 to December 2010.

Results: The study included 169 patients. Their ages at presentation ranged from 1 month to 12 years (median 2.5 years, interquartile range 5); 101 were boys. Hematemesis was a presenting symptom in 58%, splenomegaly was present in 87%, esophageal varices were present in 94%, and fundal varices were present in 23%. Possible risk factors, in the form of umbilical catheterization, umbilical sepsis, and exchange transfusion, were elicited in 18%. Propranolol was associated with reduction in bleeding episodes (P<0.001), but was associated with increased chest symptoms (P<0.01). Both injection sclerotherapy and band ligation were effective in the management of bleeding varices and for primary and secondary prophylaxis; however, injection sclerotherapy was associated with the development of secondary gastric varices (P¼0.03).

Conclusions: This large study of children with EHPVO demonstrates the efficacy of propranolol in the reduction of gastrointestinal bleeding in children with EHPVO. Both injection sclerotherapy and band ligation were effective in the management of esophageal varices, although the former was associated with the development of secondary gastric varices. Randomized clinical trials to choose the best modalities for the management of portal hypertension in children are still lacking.

Keywords: Children; Egypt; Esophageal varices; Extrahepatic portal vein obstruction; Hematemesis; Portal hypertension.

1010. Does Positioning Affect Tracheal Aspiration of Gastric Content in Ventilated Infants?

Hany Aly, Reem M. Soliman, Mohamed El-Dib, Reem N. Said, May A.K. Abdellatif, Hiba Sibaii and Amany Elwakkad

Journal of Pediatric Gastroenterology and Nutrition, 60 (3): 327-331 (2015) IF: 2.625

Objectives: Gastroesophageal reflux and aspiration can occur in premature infants who are supported with mechanical ventilation. The relation between physical positioning and gastric aspiration in ventilated infants has not been studied. Pepsin measured in tracheal aspirate (TA) emerged as a specific marker for aspiration. The objective of our study was to assess pepsin in TA of ventilated infants at 2 different positions: supine and right lateral.

Methods: We conducted a randomized controlled trial on premature infants who were enterally fed and supported with mechanical ventilation. Patients were randomized into intervention and control groups. In the intervention group, infants were placed supine for 6 hours before a sample of TA was obtained.Asecond sample was collected 6 hours later while lying in the right lateral position. In the control group, the 2 samples of TA were obtained while infants remained in the supine position during the entire study time. Pepsin in TA was measured while blinded to the group assignment.

Results: A total of 34 patients were enrolled and randomized to intervention (n¼417) and control (n¼417) groups. Gestational age was 32.72.7 weeks, and birth weight was 1617526 g; both groups had similar demographic and clinical characteristics. Pepsin concentration did not differ between groups at baseline. In the intervention group, pepsin concentration significantly declined from 13 ng/mL (interquartile range [IQR] 11.9– 38.7) to 10 ng/mL (IQR 7–12; P<0.001), whereas it did not change in the control group (P¼0.42).

Conclusions: The right lateral positioning is associated with decreased TA pepsin. The implications of the present study on hospital practice and clinical outcomes need further investigations.

Keywords: Gastroesophageal reflux; Gerd; Pepsin; Premature.

1011. Occult Hepatitis B Virus Infection in Children Born to HBsAg-Positive Mothers after Neonatal Passive-active Immunoprophylaxis

Hanan Foaud, Sahar Maklad, Faten Mahmoud and Hanaa El‑Karaksy

Infection, 43: 307-314 (2015) IF: 2.618

Background Occult hepatitis B virus infection (OBI) is a well-recognized clinical entity characterized by the detection of HBV DNA in serum and/or liver in the absence of detectable HBsAg. Diagnosis of OBI requires a sensitive HBV DNA assay. Aim We aimed at determining the frequency of OBI in infants, born to HBsAg-positive mothers, who received immunoprophylaxis at birth.

Methods Sixty-four infants and children, born to HBsAgpositive mothers, who received hepatitis B immunoglobulin and HBV vaccine within 48 h after birth, were tested for HBV serological profile and HBV DNA by real-time PCR at least 1 month after last dose of HBV vaccine and not before 6 months of age.

Results The median age of the studied infants and children was 8 months, ranging from 6 to 132 months; 54.7 % were females. HBV DNA was detected in 2 infants. One case had OBI; she was negative for HBsAg, anti-HBc total,HBeAg and was positive for anti-HBs (titer 267 mIU/mL) with low level of viremia (HBV DNA 1.13 x 103 IU/mL). Another infant showed immunoprophylaxis failure with positive HBsAg, anti-HBc total, HBeAg, negative anti-HBe and anti-HBs; HBV viral load was 1.7 × 108 IU/mL. Both mothers were HBsAg and HBeAg-positive.

Conclusion OBI may occur in infants born to HBsAgpositive mothers despite the receipt of immunoprophylaxis. OBI was detected in a low frequency in the present study. Anti-HBs positivity does not exclude OBI.

Keywords: Egypt; HBsAg-positive mothers; HBV Immunoprophylaxis; Occult HBV infection.

1012. Use of Lung Ultrasound in Detection of Complications of Respiratory Distress Syndrome

Happy K. Sawires, Eman A. Abdel Ghany, Nouran F. Hussein and Hadeel M. Seif

Repeated chest radiography is required for the diagnosis and follow-up of neonates with respiratory distress syndrome (RDS) and carries the risk of radiation hazards. Lung ultrasound (LUS) is a non-invasive bedside diagnostic tool that has proven to be effective in the diagnosis of RDS. Our aim was to assess the role of LUS with respect to the standard chest X-ray (CXR) in the detection of complications of RDS in neonates. Ninety premature newborns of both genders with RDS (mean gestational age = 29.91 ± 1.33 wk) and 40 premature babies as a control group were involved in this study. All patients underwent initial clinical assessment as well as CXR and LUS. Those who presented with respiratory distress and/or exhibited deterioration of oxygenation parameters were followed by CXR and, within 4 h, by LUS. Alveolo-interstitial syndrome and pleural line abnormalities were detected in all cases (100%) in the initial assessment, patchy consolidation was detected in 34 cases and white lung was detected in 80 cases. Alveolo-interstitial syndrome was detected in 19 controls. In follow-up of the patients, LUS was superior to CXR in detection of consolidation and sub-pleural atelectasis, but not in detection of pneumothorax. We concluded that bedside LUS is a good non-hazardous alternative tool in the early detection and follow-up of RDS in the neonatal intensive care unit; it could be of value in reducing exposure to unnecessary radiation.

Keywords: Chest X-Ray; Lung ultrasonography; Premature newborns; Respiratory distress syndrome.

1013. Correcting the Expression of miRNA-155 Represses PP2Ac and Enhances the Release of IL-2 in PBMCs of Juvenile SLE Patients

Y A Lashine, S Salah, H R Aboelenein and A I Abdelaziz

MicroRNA-155 is involved in immune cell, differentiation, maturation and function. MiR-155 showed variable dysregulated expression in autoimmune diseases such as systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA) patients. MiR-155 was previously confirmed to directly target CAMP response element binding protein (CREB), which was previously identified as a positive regulator of protein phosphatase 2A (PP2A). PP2A is a key negative regulator of interleukin-2, which is an important immune modulator and was previously shown to be decreased in SLE. In this study we aimed at investigating the regulation of PP2A by miR-155 and hence its role in juvenile SLE disease pathogenesis. MiR-155 showed significant downregulation in PBMCs from juvenile SLE and juvenile familial Mediterranean fever (FMF) and significant upregulation in PBMCs from juvenile idiopathic arthritis (JIA) patients. In SLE, miR-155 expression was negatively correlated with Systemic Lupus Erythematosus Disease Activity Index (SLEDAI) score and proteinuria and was positively correlated with white blood cell (WBC) count. The mRNA of the catalytic subunit of PP2A (PP2Ac) showed significant upregulation in PBMCs from SLE and FMF but not in JIA patients. Additionally, the relative expression of PP2Ac mRNA was positively correlated with SLEDAI score. Forced expression of miR-155 led to decreased relative expression of PP2Ac mRNA and increased IL-2 release in culturedstimulated PBMCs. This study suggests for the first time the possible role of an miR-155-PP2Ac loop in regulating IL-2 release and identifies miR-155 as a potential therapeutic target in juvenile SLE disease through relieving IL-2 from the inhibitory role of PP2A.

Keywords: MIR-155; PP2Ac; Il-2; Juvenile SLE; PBMCS.

1014. De Novo 17Q24.2–Q24.3 Microdeletion Presenting with Generalized Hypertrichosis Terminalis, Gingival Fibromatous Hyperplasia, and Distinctive Facial Features

Hanan H. Afifi, Ryoko Fukai, Noriko Miyake, Amina A. Gamal El Din, Maha M. Eid, Ola M. Eid, Manal M. Thomas, Tarek H. El-Badry, Angie M. S. Tosson, Ghada M. H. Abdel-Salam and Naomichi Matsumoto

Generalized hypertrichosis is a feature of several genetic disorders,and the nosology of these entities is still provisional. Recent studies have implicated chromosome 17q24.2–q24.3 microdeletion and the reciprocal microduplication in a very rare form of congenital generalized hypertrichosis terminalis (CGHT) with or without gingival hyperplasia. Here, we report on a 5-year-old Egyptian girl born to consanguineous parents.

The girl presented with CGHT and gingival hyperplasia for whom we performed detailed clinical, pathological, and molecular studies.

The girl had coarse facies characterized by bilateral epicanthic folds, thick and abundant eyelashes, a broad nose, full cheeks, and lips that constituted the distinctive facial features for this syndrome. Biopsy of the gingiva showed epithelial marked acanthosis and hyperkeratosis with hyperplastic thick collagen bundles and dense fibrosis in the underlying tissues.

Array analysis indicated a 17q24.2–q24.3 chromosomal microdeletion. We validated this microdeletion by real-time quantitative PCR and confirmed a perfect co-segregation of the disease phenotype within the family.In summary, this study indicates that 17q24.2–q24.3 microdeletion caused CGHT with gingival hyperplasia and distinctive facies,which should be differentiated from the autosomal recessive type that lacks the distinctive facies.

Keywords: Hypertrichosis terminalis; Gingival hyperplasia; Coarse face; Distinctive facial features; 17Q24.2-Q24.3 microdeletion; Gingival biopsy.

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1015. Pattern of Clinical Presentation of Congenital Anomalies of the Kidney and Urinary Tract Among Infants and Children

Neveen A Soliman, Reham I Ali, Emad E Ghobrial, Enmar I Habib and Ali M Ziada

Aim: Congenital anomalies of the kidneys and urinary tract (CAKUT) comprise various entities of structural malformations that result from defects in morphogenesis of the kidney and/or urinary tract. These anomalies are the most commonly diagnosed malformations in the prenatal period and constitute the leading cause of end-+stage renal disease (ESRD) in children, worldwide. This prospective study was performed to report the patterns of clinical presentation and diagnosis of infants and children with such malformations.

Methods: Patients with suggestive features of CAKUT, presenting to Cairo University Children Hospital over one year duration were investigated and categorized based on underlying renal structural/functional malformation and associated extra-renal anomalies.

Results: One hundred and seven CAKUT children were enrolled in the study. Familial clustering was identified in 14% of the cohort and syndromic CAKUT accounted for 31.8% of cases. Different anomaly entities have been identified; posterior urethral valves (PUV) being the commonest detected abnormality (36.4%). Of note, 9.3% of cohort patients had ESRD at presentation, of which 60% had PUV as their primary renal disease. Obstructive cases were noted to present significantly earlier and attain advanced CKD stages rather than non-obstructive ones.

Conclusion: CAKUT is a clinically heterogeneous group of diseases with diverse clinical phenotypes. More efforts should be aimed at improving antenatal detection as well as classification with comprehensive reference to the clinical, genetic and molecular features of the diseases. The high frequency of familial and syndromic CAKUT among studied patients is seemingly a convincing reason to pursue the underlying genetic defect in future studies.

Keywords: End stage renal disease; Posterior uretheral valves; Multicystic dysplastic kidney; Structural and functional malformations; Urinary tract infection; Vesico-ureteric reflux.

1016. Prevalence and Distribution of Iron Overload in Patients with Transfusion-Dependent Anemias Differs Across Geographic Regions: Results from the CORDELIA Study

Yesim Aydinok, John B. Porter, Antonio Piga, Mohsen Elalfy, Amal El-Beshlawy, Yurdanur Kilinc, Vip Viprakasit, Akif Yesilipek, Dany Habr, Erhard Quebe-Fehling and Dudley J. Pennell

Objectives: The randomized comparison of deferasirox to deferoxamine for myocardial iron removal in patients with transfusion-dependent anemias (CORDELIA) gave the opportunity to assess relative prevalence and body distribution of iron overload in screened patients.

Methods: Patients aged =10 yr with transfusion-dependent anemias from 11 countries were screened. Data were summarized descriptively, overall and across regions.

Results: Among 925 patients (99.1% with b-thalassemia major; 98.5% receiving prior chelation; mean age 19.2 yr), 36.7% had myocardial iron overload (myocardial T2* =20 ms), 12.1% had low left ventricular ejection fraction. Liver iron concentration (LIC) (mean 25.8 mg Fe/ g dw) and serum ferritin (median 3702 ng/mL) were high. Fewer patients in the Middle East (ME; 28.5%) had myocardial T2* =20 ms vs. patients in the West (45.9%) and Far East (FE, 40.9%). Patients in the West had highest myocardial iron burden, but lowest LIC (26.9% with LIC <7 mg Fe/g dw) and serum ferritin. Among patients with normal myocardial iron, a higher proportion of patients from the ME and FE had LIC =15 than <7 mg Fe/g dw (ME, 56.7% vs. 17.2%; FE, 78.6% vs. 7.8%, respectively), a trend which was less evident in the West (44.6% vs. 33.9%, respectively). Transfusion and chelation practices differed between regions.

Conclusions: Evidence of substantial myocardial and liver iron burden across regions revealed a need for optimization of effective, convenient iron chelation regimens. Significant regional variation exists in myocardial and liver iron loading that are not well explained; improved understanding of factors contributing to differences in body iron distribution may be of clinical benefit.

Keywords: Thalassemia; Heart; Liver; Iron; Prevalence; Distribution.

1017. Skeletal and Cardiac Muscle Involvement in Children with Glycogen Storage Disease Type III

Engy A. Mogahed, Marian Y. Girgis, Rodina Sobhy, Hala Elhabashy, Osama M. Abdelaziz and Hanaa El-Karaksy

Glycogen storage disease type III (GSD III) may present with hepatic disease or may involve both skeletal and cardiac muscles as well. To assess the prevalence of neuromuscular and cardiac involvement in a group of children with GSD III, 28 children with GSD III, diagnosed by enzymatic assay, were enrolled in the study after an informed consent was obtained from their parents/guardians and after the study protocol was approved by our institutional ethical committee. Their mean age was 6.6+3.1 years. All cases were assessed neurologically by clinical examination, electromyography (EMG), and nerve conduction velocity. The heart was examined clinically by electrocardiogram and echocardiography. Seventeen patients (61 %) had myopathic changes by EMG, three of them had associated neuropathic changes. Creatine phosphokinase (CPK) was elevated in all myopathic cases except one. Children with myopathic changes were significantly older (p=0.02), and CPK was significantly higher (p<0.0001). Nine cases had left ventricular (LV) hypertrophy, seven of them had myopathic changes by EMG. **Conclusion**: Myopathic changes are not uncommon in children with GSD III. Myopathic changes tend to occur in older age and are associated with higher CPK level. Cardiac muscle involvement is less common in this age group and may, on occasion, occur alone without skeletal muscle involvement. Despite mild degrees of affection in this age group, it is recommended to perform prospective annual screening using EMG and echocardiography in order to augment dietary therapy regimen to prevent progression to life threatening complications.

1018. Chroinc Granulomatus Disease:Review of A Cohort of Egyptian Patients

Meshaal S, El Hawary R, Abd Elaziz D, Alkady R, Galal N, Boutros J and Elmarsafy A

Background: Chronic granulomatous disease (CGD) is an inherited disease that Results from a defect in the phagocytic cells of the immune system. It is caused by defects in one of the major subunits of the nicotinamide adenine dinucleotide phosphate (NADPH) oxidase complex. The clinical presentations of CGD patients are heterogeneous.
Objectives: This is the first report from Egypt discussing clinical and laboratory data of twenty-nine patients (from 26 families) with CGD from a single tertiary referral centre.
Results: There were twenty male and nine female patients. The consanguinity rate was 76% (19/25). Their age of diagnosis ranged from 2 to 168 months with a mean of 52.8 months ± 49.6 SD. The most common manifestations were abscesses in 79.3% (deep organ abscesses in 37.9% of patients), followed by pneumonia in 75.8% and gastrointestinal symptoms in 27.5%. Rare but fatal complications were also reported among patients as one patient developed haemophagocytic lymphohistiocytosis (HLH) syndrome. Although X linked-CGD universally constitutes the most common pattern of inheritance; only 6 of our patients 6/25 (24%) belonged to this group with a Stimulation Index (SI) of 1-5, and confirmed by carrier pattern of their mothers. Mothers were not available for testing in four male children. Nineteen patients (76%) had autosomal recessive patterns; ten males and nine females patients based on having abnormal SI, positive history of consanguinity and their mothers showing normal SI.
Conclusion: Increasing the awareness of physicians about symptoms of CGD may lead to earlier diagnosis of the disease, thus enhancing proper management and better quality of life.
Keywords: CGD; Primary immunodeficiency.

1019. Effect of On-line Hemodiafiltration on P-wave Dispersion in Children

Happy Sawires, Samuel Makar and Hanan Zekry

P-wave dispersion (PWD) (difference between the maximum and minimum P-wave duration), has been proposed as a useful predictor of paroxysmal atrial fibrillation (AF). The consequences of hemodialysis (HD) on PWD and P-wave duration have not been unequivocally documented and understood, and may be complex. We aimed in this work to demonstrate the effects of online hemodiafiltration (OL-HDF) on the risk of developing AF through assessment of PWD. Thirty-three pediatric patients (14 males and 19 females with mean age of 11.66±2.93 years) on conventional HD for at least 6 months underwent echocardiography, 12-lead electrocardiogram and PWD calculation. Then they were switched to OL-HDF for another 6 months and same parameters were reassessed. Thirty sex- and aged-matched healthy children, served as controls. PWD significantly decreased upon switching to OL-HDF (P<0.001) and fractional shortening significantly improved (P<0.001). Mean PWD of controls (24±6ms) was significantly less than PWD before and after OL-HDF (P<0.001 and <0.001, respectively). Online HDF significantly decreased PWD and hence also the potential of AF development, which may invite a higher consideration of this renal replacement modality in a pediatric population.
Keywords: Atrial fibrillation; Diastolic dysfunction; End-stage renal disease; Online hemodiafiltration; P-wave dispersion.

1020. NT-ProBNP as Early Marker of Subclinical Late Cardiotoxicity after Doxorubicin Therapy and Mediastinal Irradiation in Childhood Cancer Survivors

Amal Zidan, Laila M. Sherief, Amera El-sheikh, Safaa H. Saleh, Doaa A. Shahbah, Naglaa M. Kamal, Hanan S. Sherbiny and Heba Ahmad

Background: Childhood cancer survivors treated with anthracyclines and mediastinal irradiation are at risk for late onset cardiotoxicity.
Aims of the Study: To assess the role of N-terminal pro-brain natriuretic peptide (NT-proBNP) and tissue Doppler imaging (TDI) as early predictors of late onset cardiotoxicity in asymptomatic survivors of childhood cancer treated with doxorubicin with or without mediastinal irradiation.
Methods: A cross-sectional study on 58 asymptomatic survivors of childhood cancer who received doxorubicin in their treatment protocols and 32 asymptomatic Hodgkin's lymphoma survivors who received anthracycline and mediastinal irradiation. Levels of NT-proBNP, TDI, and conventional echocardiography were determined.
Results: Thirty percent of survivors had abnormal NT-proBNP levels. It was significantly related to age at diagnosis, duration of follow-up, and cumulative dose of doxorubicin. TDI detected myocardial affection in 20% more than conventional echocardiography. Furthermore, abnormalities in TDI and NT-pro-BNP levels were more common in Hodgkin lymphoma survivors receiving both chemotherapy and radiotherapy.
Conclusions: TDI could detect early cardiac dysfunction even in those with normal conventional echocardiography. Measurement of NT-proBNP represents an interesting strategy for detecting subclinical cardiotoxicity. We recommend prospective and multicenter studies to validate the role of NT-proBNP as an early marker for late onset doxorubicin-induced cardiotoxicity.
Keywords: NT-ProBNP; Early marker; Subclinical late cardiotoxicity; Doxorubicin; Mediastinal irradiation; Childhood; Cancer survivors.

1021. Vitamin D Status in Egyptian Patients with Juvenile-onset Systemic Lupus Erythematosus

Kamal El Garf, Huda Marzouk, Yomna Farag, Laila Rasheed and Ayman El Garf

Medicine Sector

There are scanty data on the prevalence of vitamin D deficiency and its relation to disease activity among patients with juvenile-onset systemic lupus erythematosus (JoSLE) in the Middle East and North Africa, an area known to be endemic for vitamin D deficiency and insufficiency. The aim of this study was, therefore, to study vitamin D status and its relation to disease activity and parameters in Egyptian patients with JoSLE. Serum levels of 25(OH) D3 in 70 JoSLE patients were compared to 40 age-, sex-, and body mass index-matched healthy controls. The 25(OH) D3 was determined by enzyme-linked immunosorbent assay. Information regarding the medical history, clinical symptoms, and signs was registered at the time of serum sampling. Disease activity of SLE was evaluated according to the SLEDAI score. The mean level of serum 25(OH) D3 was 12 ± 3.7 in JoSLE patients compared to 21 ± 3.5 ng/mL in normal controls (p < 0.001). Forty percent (28/70) of the JoSLE patients has severe 25(OH) D3 deficiency (=10 ng/mL), and 60 % of the JoSLE patients has 25(OH) D3 insufficiency (=30 ng/mL). None of the JoSLE patients has 25(OH) D3 level >30 ng/mL. There was no significant correlation between serum levels of 25(OH) D3 and the demographic data, medication used, and some laboratory data of patients with JoSLE. Diseaseactivity score in our patients was insignificantly correlated with serum levels of 25(OH) D3. In spite of vitamin D supplementation in Egyptian JoSLE patients and the presence of vitamin D insufficiency in the control group, there are still significantly lower levels of vitamin D in JoSLE compared to normal controls.

Keywords: Vitamin D insufficiency; Severe vitamin D deficiency; Juvenile-onset SLE (JoSLE); Disease activity.

1022. Relationship Between Angiotensin-Converting Enzyme Gene Polymorphism and Respiratory Distress Syndrome in Premature Neonates

Nouran Fahmy Hussein, Eman Abdel Ghany Abdel Ghany, Walaa Alsharany Abu Elhamed and Rania Mohamed Samy

Objective The aim of this study was to investigate the possible relationship between angiotensin-converting enzyme (ACE) gene polymorphism (D/D and I/D genotypes) and respiratory distress syndrome (RDS) in preterm neonates. STUDY DESIGN: Our study included 120 preterm neonates (<37 weeks of gestation) with RDS (the patient group) and 120 preterm neonates without RDS (the control group). Blood samples were obtained from patients and control groups, and ACE gene polymorphism was analysed using the polymerase chain reaction method.

Results: D/D genotype was highly significant in the patient group compared with the control group (48.3% of RDS group vs 20% of the control group, $P < 0.001$). Meanwhile, I/D and I/I genotypes were significantly higher in the control group (75% and 5% of the control group vs 50% and 1.7% of the patient group, $P < 0.001$). D/D genotype was highly significant in neonates with bronchopulmonary dysplasia (BPD) compared with I/D genotype ($P = 0.001$).

Conclusion: Our Results may suggest that D/D genotype is associated with increased risk of RDS and BPD development in preterm neonates.

Keywords: ACE gene polymorphism; Bronchopulmonary dysplasia; Preterm infant; Respiratory distress syndrome.

1023. A Study of Familial Mediterranean Fever (MEFV) Gene Mutations in Egyptian Children with Type 1 Diabetes Mellitus

Ghada Mohammad Anwar, Hanan M. Fouad, Amal Abd El-Hamid, Faten Mahmoud, Noha Musa, Hala Lotfi and Nermine Salah

Background/Aims: An association of type 1 DM and familial Mediterranean fever (FMF) has been newly reported in the medical literature. The aim of the present work was to investigate frequency of MEFV gene mutations in Egyptian children with type 1 diabetes mellitus.

Methods: Forty five children with type 1 DM were screened for Mediterranean Fever (MEFV) gene mutation. Forty one healthy control subjects were included. Identification of FMF gene mutation was done based on polymerase chain reaction (PCR) and reverse hybridization. The assay covers 12 mutations in the FMF gene: E148Q e P369S e F479L e M680I (G/C) e M680I (G/A) e I692del e M694V e M694I e K695ReV726A e A744S and R761H.

Results: Among the screened diabetics, the overall frequency of MEFV gene mutations was 42.2% and among the control group it was 34.1% with no significant difference. Fourteen out of 45 diabetic children (31.1%) were heterozygous (E148Q in 7 children, A744S in 3 children, V726A in 2 children, M680I (G/C) in 1 child and P369S in1 child), while 5 children (11.1%) were compound heterozygous (M694V/M694I in 2 children, E148Q/K695R mutations in 1 child, E148Q/M694I in 1 child and E148Q/V726A in 1 child). The control group showed heterozygous mutation in 34.1% of cases (E148Q mutation in 14.6%, V726A in 12.2%, M680I (G/C) in 4.9% and M694V in 2.4%).

Conclusion: No significant difference in mutation frequency between diabetic and non-diabetic children. We have high carrier rate of MEFV gene mutations among Egyptian population probably due to high consanguinity.

Keywords: Type 1 Diabetes; Familial mediterranean fever; Children; MEFV gene mutation.

1024. Inhomogeneous Longitudinal Cardiac Rotation and Impaired Left Ventricular Longitudinal Strain in Children and Young Adults with End-Stage Renal Failure Undergoing Hemodialysis

Ruth Lagies, Bodo B. Beck, Bernd Hoppe, Sahar S. Sheta, Verena Weiß, Narayanswami Sreeram and Floris E. A. Udink ten Cate

Background Cardiac dysfunction frequently complicates the clinical course of patients with end-stage renal failure (ESRF). Recently, we observed abnormal longitudinal cardiac rotation (LR) among patients with ESRF. In this study, we sought to quantify LR mechanics in patients undergoing hemodialysis (HD).

Methods Twenty-four subjects, 12 ESRF patients (58% male; age 17.5 ± 4.4 years) receiving HD, and 12 aged-matched controls, were prospectively studied. Patients underwent echocardiographic studies before and after HD. LR mechanics were quantified with two-dimensional speckle tracking

echocardiography. Peak systolic left ventricular (LV) longitudinal strain and displacement measurements were obtained in all subjects.

Results LR mechanics were successfully quantified in all subjects using 5 key echocardiographic features of LR. We identified two different inhomogeneous LR motion patterns in 41.7% of ESRF patients, characterized by a delayed timing of LR or increased segmental apical rotation. Inhomogeneous LR patterns were not found in controls. Timing of early-systolic counterclockwise LR increased after HD (P = 0.006). In patients, late-systolic clockwise LR occurred earlier (P = 0.043), and showed a significant prolongation after HD (P = 0.003). Longitudinal strain was significantly impaired in patients (P = 0.015), and further decreased after HD (P < 0.0001). Strong correlations were observed between strain and displacement parameters and LR mechanics.

Conclusions Quantifying LR using speckle tracking echocardiography was feasible, easy, and reproducible. Inhomogeneous LR motion patterns were demonstrated in a large proportion of patients with ESRF. LV dysfunction seems the most important determinant of inhomogeneous LR. Further studies are required to validate these findings.

Keywords: End-stage renal failure; Speckle tracking echocardiography; Longitudinal rotation; Hemodialysis; Apical rocking.

1025. Human Surfactant Proteins A2 (SP-A2) and B (SP-B) Genes as Determinants of Respiratory Distress Syndrome

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Ndian Pediatr, 52: 391-394 (2015) IF: 1.04

Objective To study the relationship between SP-A2 and SP-B gene polymorphisms and respiratory distress syndrome in preterm neonates. DESIGN: Cross-sectional. SETTING: Neonatal intensive care unit and the Molecular Biology unit of the Chemical Pathology Department, Kasr Alainy hospital, Cairo University.

Participants: Sixty-five preterm infants with respiratory distress syndrome and 50 controls. The genomic DNA was isolated using DNA extraction kits. SYBR Green-based real-time PCR was used to determine the variant genotypes of SP-A2 c.751 G>A and SP-B c.8714 G>C single nucleotide polymorphisms.

Results: Homozygosity of SP-A (OR 46, 95% CI 14-151) and SP-B (OR 5.2, 95% CI 2.3-11.4) alleles increased the risk of respiratory distress syndrome. The logistic regression model showed that genotypes SP-A2 (OR 164) and SP-B (OR 18) were directly related to the occurrence of respiratory distress syndrome, whereas gestational age (OR 0.57) and 5-minute Apgar score (OR 0.19) were inversely related to its occurrence.

Conclusions: There is a possible involvement of SP-A2 and SP-B genes polymorphisms in the genetic predisposition to respiratory distress syndrome.

Keywords: Neonate; Polymorphisms; Respiratory distress syndrome; Surfactant protein.

1026. Serum Copeptin Level as A Predictor of Outcome in Pneumonia

Mohammed Abdel-Fattah, Bassant Meligy, Riham El-Sayed and Yosra A El-Naga

Indian Pediatrics, 52: 807-808 (2015) IF: 1.04

This cross-sectional study included 41 children (age 2 mo-12 y) with pneumonia and 40 healthy controls. Assay of serum copeptin was done using ELISA. Median serum copeptin levels were significantly higher (P=0.03) in children with pneumonia, and in those who died (P=0.04). We conclude that serum copeptin levels seem to be associated with poor outcome in pneumonia.

Keywords: Copeptin; Pneumonia; Prognosis.

1027. Mesenteric and Mediastinal Lymphadenopathy in Egyptianchildren with Gaucher Disease Types 1 and 3 Treated with Enzyme Replacement Therapy

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Journal of Pediatric Hematology Oncology, : - (2015) IF: 0.902

Gaucher disease (GD) is characterized by 3 clinical subtypes; type 1 GD (non-neuronopathic) and types 2 and 3 GD (acute and chronic neuronopathic forms, respectively). There are few reports of mesenteric and mediastinal lymphadenopathy, and none in type 1 GD or in African people. We report 8 Egyptian GD children (3 type 1 GD and 5 type 3 GD) who developed mesenteric and mediastinal lymphadenopathy despite receiving enzyme replacement therapy. Biopsy showed infiltration with Gaucher cells and no malignant changes. Pediatric physicians should be aware of possible lymphadenopathy associated with both types 1 and 3 GD as it can mimic malignancy.

Keywords: Gaucher disease type 1 and 3; Enzyme replacement therapy; Lymphadenopathy; Egyptian.

1028. Assessment of Inter-atrial, Inter-ventricular, and Atrio-ventricular Interactions in Tetralogy of Fallot Patients after Surgical Correction. Insights from Two-dimensional Speckle Tracking and Three-Dimensional Echocardiography

Mohamed Abd El Rahman, Tanja Raedle-Hurst, Axel Rentzsch, Hans-Joachim Schäfers and Hashim Abdul-Khaliq

Cardiology in the Young, 25 (7): 1254-1262 (2015) IF: 0.835

Background: We aimed to assess biatrial size and function, interactions on atrial and ventricular levels, and atrio-ventricular coupling in patients after tetralogy of Fallot repair.

Methods: A total of 34 patients with a mean age of 20.9±9 years, and 35 healthy controls, underwent two-dimensional speckle tracking echocardiography for ventricular and atrial strain measurements and real-time three-dimensional echocardiography to assess ventricular and atrial volumes.

Results: When compared with controls, tetralogy of Fallot patients had significantly reduced right atrial peak atrial longitudinal strain (p<0.01), right atrial peak atrial contraction strain (p<0.01), right atrial ejection fraction (p<0.01), left atrial peak atrial longitudinal strain (p<0.01), left atrial peak atrial contraction strain (p<0.05), and left atrial ejection fraction (p<0.01). In the tetralogy of Fallot group, left ventricular ejection

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fraction was negatively related to the right ventricular end-systolic volume normalised to body surface area (r=-0.62, p<0.01). An association was found in patients between the right atrial peak longitudinal strain and mean right ventricular strain (r=0.64, p<0.01). In patients, the left atrial peak longitudinal strain correlated negatively with right atrial end-diastolic volume normalised to body surface area (r=-0.67, p<0.01), whereas the left atrial ejection fraction correlated weakly with left ventricular ejection fraction (r=0.41, p<0.05).

Conclusions: In asymptomatic tetralogy of Fallot patients, biatrial dysfunction exists and can be quantified via two-dimensional speckle tracking echocardiography as well as real-time three-dimensional echocardiography. Different forms of interactions on atrial and ventricular levels are evident among such cohorts.

Keywords: Tetralogy of fallot; Atrial function; Real-time three-dimensional echocardiography; Two-dimensional echocardiography.

1029. First Report of Acute Lymphoblastic Leukemia in an Egyptian Child with β-Thalassemia Major

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β-Thalassemia (β-thal) is the most common hereditary anemia in humans. With improvement of treatment protocols, patients are living longer and new complications have emerged. Few articles have reported the occurrence of malignancies among patients with β-thal in different parts of the world. We herein report the first pediatric patient with β-thal major (β-TM), who developed acute lymphoblastic leukemia in Egypt with analysis of the different theories of pathogenesis.

Keywords: Acute lymphoblastic leukemia (ALL); Egypt; Children; β-Thalassemia (β-Thal).

1030. Micronucleus Assay as A Biomarker for Chromosome Malsegregation in Young Mothers with Down Syndrome Children

S. Abdel Hady, H.H. Afifi, E.A. Abdel Ghany, M.B. Taher and M.M. Eid

Micronucleus assay as a biomarker for chromosome malsegregation in young mothers with Down syndrome children: The aim of the present study is to test the susceptibility of chromosome 21 malsegregation in young mothers of Down syndrome children using combined micronucleus (MN) assay and FISH analysis. The present study included 62 Egyptian young mothers (age < 30 y) who were divided into 22 mothers of DS offspring and 40 age matched controls. All subjects were subjected to chromosomal analysis, micronucleus assay, and FISH analysis. High statistical significant difference was found between mothers of Down syndrome (MDS) and the controls in the MN percentage (P=0.034). Also there was high statistical significant difference between MDS and the controls in the percentage of positive malsegregation (P =0.0001). The specificity of combined MN% with FISH was 90%, while the sensitivity was 63.6%. Combined MN-FISH test is highly specific but moderately sensitive in assessing the risk of having children with DS in young mothers.

Keywords: Young mothers of down syndrome; Micronucleus assay; Fish; Malsegregation.

1031. The Burden of Different Pathogens in Acute Diarrhoeal Episodes Among A Cohort of Egyptian Children Less Than Five Years Old

Mortada El-Shabrawi, Mohammed Salem, Maha Abou-Zekri, Suzan El-Naghi, Fetouh Hassanin, Tarek El-Adly and Ayman El-Shamy

Introduction: Diarrhoea continues to cause significant morbidity in Egypt AIM: To determine the frequency and distribution of different enteropathogens in acute diarrhoeal episodes, utilising an expanded testing regimen, and to correlate clinical signs and symptoms associated with the detected pathogens.

Material and Methods: The case-control study enrolled 356 patients < 5 years old with acute diarrhoea and 356 age and sex-matched healthy controls. Both cases and controls underwent a full history and physical examination, and provided two rectal swab specimens and a stool sample. Laboratory analysis included stool culture, microscopy, and indirect Methods.

Results: Rotavirus was detected in 11% of patients. Enterotoxigenic Escherichia coli (ETEC), Campylobacter, Shigella, and Salmonella were detected in 7%, 3.7%, 1.1%, and 1.4% of patients, respectively; and in 11.1%, 3.1%, 0.6%, and 0.6% of controls, respectively, with no significant statistical difference. Cryptosporidium was detected in 3.9% of cases. Mixed infection was detected in 5.9% of cases and 0.9% of controls, with a significant difference (p < 0.001). No pathogen was detected in 66.3% of cases and in 83.5% of controls. Rotavirus infection was associated with recurrent vomiting, dehydration, and hospitalisation. Bacterial diarrhoea was associated with vomiting (52%) in ETEC infections, fever (80%) in Salmonella infections, mucus (100%) and blood (50%) in stools of Shigella infections, and convulsions (15%) in Campylobacter infections.

Conclusions: Rotavirus is a prominent cause of diarrhoea among Egyptian children. Despite utilising an expanded testing regimen, more work is still needed for identification of other enteropathogens that constitute other causative agents of diarrhoea.

Keywords: Egypt; Acute; Children; Diarrhoea; Rotavirus.

1032. Serum Klotho: Relation to Fibroblast Growth Factor-23 and Other Regulators of Phosphate Metabolism in Children with Chronic Kidney Disease

Happy K. Sawires, Rasha M. Essam, Marian F. Morgan and Rasha A. Mahmoud

FGF23 and Klotho synergize to regulate phosphate homeostasis by promoting renal phosphate excretion. Chronic kidney disease (CKD) may be viewed as a state of FGF23 resistance caused by Klotho deficiency. This viewpoint explains several observations

on phosphate metabolism in CKD that lack mechanistic insights. Our objectives were to correlate serum klotho and FGF-23 with other variables that regulate phosphate metabolism. We studied 40 patients with CKD on conservative treatment (group A), 44 patients with endstage renal disease (ESRD) on regular hemodialysis (group B), 40 kidney transplant recipients (KTR) (group C) and 40 healthy controls for measuring serum klotho and FGF-23.

Blood samples were withdrawn for measuring the levels of serum Calcium (Ca), Phosphorus (P), alkaline phosphatase (ALP), 1,25 (OH) 2 D 3 , intact parathyroid hormone (PTH), FGF- 23 and α klotho. The mean levels of FGF-23 and α klotho in control group were 225.78 ± 111.05 pg/ml (range: 102.4, 418.5) and 6.78 ± 1.90 ng/ml (range: 4, 11), respectively. The mean levels of FGF-23 in the 3 studied groups were $1,034.2 \pm 84.6$, $1,288.7 \pm 131.4$ and $1,008.7 \pm 117.6$ pg/ml, respectively.

The median levels of s-klotho in the 3 studied groups were 3.15, 2.3 and 2.95, respectively. It was found that FGF-23 was significantly increased and α klotho was significantly de- creased in all patients when compared with those in the control group ($p < 0.001$, <0.001, respectively). We found that there was a significant inverse correlation between serum Ca and α klotho in the studied groups. There was no significant correlation between FGF-23 and α klotho in the studied groups ($p > 0.05$). We have shown that circulating s-klotho was not related to FGF-23 in CKD, dialysis and KTR patients.

In addition, we demonstrated a novel association between serum Ca and s-klotho that needs to be further studied.

Keywords: FGF-23; Klotho; Phosphorus; Chronic kidney disease; Kidney transplantation; Dialysis.

1033. Chanarin–dorfman Syndrome: A Case Report and Review of the Literature

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Arab Journal of Gastroenterology, 16: 142-144 (2015)

Chanarin–Dorfman syndrome, a ''neutral lipid storage disease with ichthyosis,'' is a multisystem inherited metabolic disorder associated with congenital ichthyosis and accumulation of lipid droplets in various types of cells. Case report: A 3-year-old male presented to the Pediatric Hepatology Unit, Cairo University Children's Hospital, Cairo, Egypt, with accidentally discovered hepatomegaly.

He had generalised ichthyosis with dark skin pigmentation and bilateral ectropion. Abdominal examination revealed generalised abdominal distention with firm nontender hepatomegaly. His liver functions were deranged. Blood film showed many vacuolated neutrophils.

Serum triglyceride and creatine kinase levels were elevated. Abdominal ultrasound showed a moderately enlarged liver with a bright echo pattern. Liver biopsy revealed marked diffuse macrovesicular fatty changes. The diagnosis of Chanarin–Dorfman Syndrome was made based on the dermatological, haematological, and liver biopsy findings.

Keywords: Chanarin–dorfman syndrome; Hepatomegaly; Ichthyosis.

1034. The Effect of Regular Hemodialysis on the Nutritional Status of Children with End-stage Renal Disease

Hala M. Lotfy, Samar M. Sabry, Emad E. Ghobrial and Samer A. Abed

Saudi Journal of Kidney Diseases and Transplantation, 26: 263-270 (2015)

Growth failure is one of the most common and profound clinical manifestation of chronic kidney disease (CKD) in infants, children and adolescents. The aim of this study was to assess the nutritional status of Egyptian children with end-stage renal disease (ESRD) on regular hemodialysis (HD). The study included 50 Egyptian children with ESRD on regular HD, following-up at the Pediatric Nephrology unit, Cairo University. History, including dietary history, was taken for all patients and clinical examination was performed on all of them. Body weight, standing height, height or length SD score, the skin fold thickness, mid-arm circumference, mid-arm muscle circumference and mid-arm muscle circumference area were also assessed. The height of the patients was the most affected anthropometric parameter, as 78% of the patients were shorter (height SDS below -3). Body weight is less affected than height, as body weight SDS of 34% of patients was less than -3 SDS. In addition, the body mass index of 16% of the patients was <3rd percentile, while only 4% of the patients were >97th percentile. Although most ESRD patients received adequate protein and caloric intake, their growth was markedly affected, especially with longer period on HD. We suggest that assessment of growth parameters should be performed at a minimum period of every six months in children with CKD stages 2–3. For children with more advanced CKD (stages 4–5 and 5D), more frequent evaluation may be warranted due to the greater risk of abnormalities.

Keywords: Regular hemodialysis; Children; Nutritional status.

1035. Urinary Monocyte Chemoattractant Protein-1 as A Biomarker of Lupus Nephritis Activity in Children

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Saudi Journal of Kidney Diseases and Transplantation, 26: 507-515 (2015)

Systemic lupus erythematosus (SLE) is a life-long, life-limiting and multi-systemic autoimmune disease. Glomerulonephritis is one of the most serious manifestations of SLE. Younger children have an increased incidence, severity and morbidity of lupus nephritis (LN) compared with adult-onset disease. Monocyte chemoattractant protein-1 (MCP-1) enhances leukocyte adhesiveness and endothelial permeability in the kidneys of murine and human LN models. Our study aimed to assess the role of urinary MCP-1 in the early diagnosis of LN activity. Sixty children, of whom 45 children aged from six to 12 years old and of both sexes (15 SLE patients without nephritis, 15 active LN and 15 inactive LN) fulfilling the American College of Rheumatology Classification Criteria for SLE were studied in comparison with 15 healthy subjects. We investigated the serum and urinary MCP-1 in all groups using the enzyme-linked immunosorbent assay test. Urinary MCP-1 was significantly higher in active LN in comparison with inactive LN and controls,

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and also significantly higher in inactive LN in comparison with SLE without nephritis and controls. There was also a significant difference between SLE without nephritis and controls. Serum MCP-1 was significantly higher in the group with active LN in comparison with the inactive group and SLE without nephritis and controls, but there was no significant difference between SLE and controls. The urinary MCP-1 level correlated well with SLE disease activity as measured by the Systemic Lupus Erythematosus Disease Activity Index (SLEDAI). Urinary MCP-1 correlates positively with proteinuria, blood urea nitrogen level and creatinine and negatively with hemoglobin and creatinine clearance. We concluded that measurement of MCP-1 in urine may be useful for monitoring the severity of renal involvement in SLE. We recommend measuring urinary MCP-1 in pediatric SLE for the early diagnosis of LN and for the evaluation of the severity of renal involvement.

Keywords: Urinary monocyte chemoattractant protein-1; Lupus nephritis activity;Children.

1036. Nonalcoholic Steatohepatitis in Children: the Modern Day Pediatric Epidemic

Mortada El-Shabrawi and Mona Issa

Journal of Gastroenterology and Hepatology Research, 4(7): 1663-1670 (2015)

Nonalcoholic fatty liver disease has emerged as the leading cause of chronic liver disease in children and adolescents in the United States. A two- to three-fold rise in the rates of obesity and overweight in children over the last 2 decades is probably responsible for the epidemic of nonalcoholic fatty liver disease. Emerging data suggest that children with nonalcoholic steatohepatitis progress to cirrhosis which may ultimately increase liver-related mortality. More worrisome is the recognition that cardiovascular risk and morbidity in children and adolescents is associated with fatty liver. Pediatric fatty liver disease often displays a histologic pattern distinct from that found in adults. Liver biopsy remains the gold standard for diagnosis of nonalcoholic steatohepatitis. Non-invasive biomarkers are needed to identify individuals with progressive liver injury. Targeted therapies to improve liver histology and metabolic abnormalities associated with fatty liver are needed. Currently, randomizedcontrolled trials are underway in the pediatric population to define pharmacologic therapy for nonalcoholic steatohepatitis. Public health awareness and intervention are needed to promote healthy diet, exercise, and lifestyle modifications to prevent and reduce the burden of disease in the community

Keywords: Nonalcoholic; Steatohepatitis; Children.

1037. Bifidobacterium Lactis in Treatment of Children with Acute Diarrhea. A Randomized Double Blind Controlled Trial

Neveen Helmy Abou El-Soud, Reem Nabil Said, Dalia Sayed Mosallam, Nahla Abdel, Moniem Barakat and Mohamed Ahmed Sabry

Macedonian Journal of Medical Sciences, 3: 403-407 (2015)

Background: Probiotics are becoming increasingly popular treatment for children diarrhea. Although there are several

probiotic strains potentially useful, researches were often limited to certain strains. AIM: To test Bifidobacterium lactis on morbidity of acute diarrhea in children less than 2 years.

Subjects and Methods: A randomized double-blind controlled clinical trial was conducted in 50 children (1 - 23 months) admitted with acute diarrhea to the Pediatric Hospital, Cairo University and were randomly assigned to receive in addition to usual treatment of diarrhea according to WHO guidelines; one of two treatments either milk formula non-supplemented (n = 25) or supplemented (n = 25) with Bifidobacterium lactis 14.5 x 106 CFU/100 ml daily for one week. Primary outcomes were frequency and duration of diarrhea and hospital stay. Secondary outcomes were duration of fever and vomiting episodes. Safety and tolerance were also recorded.

Results: On admission, patients' characteristics of both groups (50 cases) were similar. For children who received the probiotics for one week; mean duration of diarrhoea was shorter than in controls (3.12 ± 0.92 vs. 4.10 ± 0.94 days) (P = 0.02), number of motions per day was less than in controls (3.96 ± 0.62 vs. 4.46 ± 0.85) (P = 0.04) and discharge from hospital <2 days was more frequent than in controls (72% vs. 44%) (P = 0.048). There was no effect on fever (P = 0.63) or vomiting (P = 0.54).

Conclusion: Bifidobacterium lactis probiotics in supplemented milk formula decreased significantly frequency, duration of diarrhea, and hospital stay than usual treatment alone in children with acute diarrhea. Additional researches on other uncommon local probiotic species should be encouraged.

Keywords: Probiotics; Bifidobacterium Lactis; Acute.

Dept. of Pharmacology

1038. Comparative Study of the Effect of Diacerein and Diclofenac Sodium and their Combination in Osteoarthritis Model Induced by Monoiodoacetate in Albino Rats

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Research Journal of Pharmaceutical, Biological and Chemical Sciences, 6(3): 1079-1089 (2015)

Osteoarthritis (OA) is the most common joint disorder. The current treatment of osteoarthritis is primarily focused on symptomatic relief by the use of rapidly acting analgesics such as NSAIDs and newer cyclooxygenase-2 (COX-2) specific inhibitors. Diacerein, an Interleukin-1β-antagonist that has been used in the last few years in the treatment of OA. This work was designed to compare the anti-inflammatory effect of Diacerein with Diclofenac Sodium and their combination on albino rats model of osteoarthritis. Ninety adult healthy female albino rats were allocated into 5 groups: normal untreated animals (negative control), the disease model group that received a single dose of monoiodoacetate (MIA) intra articularly in their right knees (positive control), and the (MIA) induced osteoarthritis treated either by Diacerein, diclofenac sodium, or their combination for 6 weeks. Level of serum cartilage oligomeric matrix protein, histopathological examination, and radiological assessment were performed. The Results revealed that Diacerein has the potential to ameliorate osteoarthritic changes unlike the commonly used NSAIDs.

Keywords: Comparative; Osteoarthritis; Diacerein; Diclofenac sodium; Monoiodoacetate.

Dept. of Physiology

1039. Modification of Hippocampal Markers of Synaptic Plasticity by Memantine in Animal Models of Acute and Repeated Restraint Stress: Implications for Memory and Behavior

Shaimaa Nasr Amin, Ahmed Amro El-Aidi, Mohamed Mostafa Ali, Yasser Mahmoud Attia and Laila Ahmed Rashed

Stress is any condition that impairs the balance of the organismphysiologically or psychologically. The response to stress involves several neurohormonal consequences. Glutamate is the primary excitatory neurotransmitter in the central nervous system, and its release is increased by stress that predisposes to excitotoxicity in the brain.Memantine is an uncompetitive N-methyl D-aspartate glutamatergic receptors antagonist and has shown beneficial effect on cognitive function especially in Alzheimer's disease. The aim of the work was to investigate memantine effect on memory and behavior in animal models of acute and repeated restraint stress with the evaluation of serum markers of stress and the expression of hippocampal markers of synaptic plasticity. Forty-two male rats were divided into seven groups (six rats/group): control, acute restraint stress, acute restraint stress with Memantine, repeated restraint stress, repeated restraint stress with Memantine and Memantine groups (two subgroups as positive control). Spatial working memory and behavior were assessed by performance in Y-maze.We evaluated serum cortisol, tumor necrotic factor, interleukin-6 and hippocampal expression of brain-derived neurotrophic factor, synaptophysin and calcium-/calmodulin-dependent protein kinase II. Our Results revealed thatMemantine improved spatialworking memory in repeated stress, decreased serum level of stress markers and modified the hippocampal synaptic plasticity markers in both patterns of stress exposure; in ARS, Memantine upregulated the expression of synaptophysin and brainderived neurotrophic factor and downregulated the expression of calcium-/calmodulin-dependent protein kinase II, and in repeated restraint stress, it upregulated the expression of synaptophysin and downregulated calcium-/calmodulin-dependent protein kinase II expression.

Keywords: Restraint memantine memory behavior synaptic plasticity.

1040. The Utility of Iron Chelators in the Management of Inflammatory Disorders

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Since iron can contribute to detrimental radical generating processes through the Fenton and Haber-Weiss reactions, it seems to be a reasonable approach to modulate iron-related pathways in inflammation. In the human organism a counterregulatory reduction in iron availability is observed during inflammatory diseases. Under pathological conditions with reduced or increased baseline iron levels different consequences regarding protection or susceptibility to inflammation have to be considered. Given the role of iron in development of inflammatory diseases, pharmaceutical agents targeting this pathway promise to improve the clinical outcome. The objective of this review is to highlight the mechanisms of iron regulation and iron chelation, and to demonstrate the potential impact of this strategy in the management of several acute and chronic inflammatory diseases, including cancer.

Keywords: Iron; Chelators; Inflammatory disorders.

1041. Evaluation of the Effects of Eserine and JWH-133 on Brain Dysfunction Associated with Experimental Endotoxemia

Maha Gamal, Jackline Moawad, Laila Rashed,Wafaa El-Eraky, Dalia Saleh, Christian Lehmann and Nivin Sharawy

Sepsis is associated with neuronal damage and cognitive impairment, with the participation of pro-inflammatory cytokines and oxidative–nitrous stress. It is known that activated microglia plays a vital role in neuro-inflammation and neuro-degeneration. Thus, the objective of this study was to evaluate therapeutic roles of two microglia regulating agents, JWH-133 and Eserine, on the neuroinflammatory associated brain dysfunctions. To achieve our aim, we used control rats or submitted rats to lipopolysaccharide (LPS) challenge. 30 min after LPS challenge, the animals received either saline, Eserine, JWH-133 or Eserine + JWH-133. After 24 h, animals were submitted to the habituation to T maze, Rotarod and activity cage tests. The rats were killed after and were evaluated for central and peripheral inflammatory and oxidative parameters. We observed that the use of Eserine, JWH-133 or Eserine + JWH-133 reverted the increases in the inflammatory markers [interleukin 6 (IL6), vascular cell adhesion molecule 1(VCAM-1) and Eselectin] and oxidative–nitrous stress MDM, and that the anti-inflammatory, antioxidant properties of both JWH-133 and Eserine successfully improve the LPS induced brain dysfunction. Conclusions The Results observed in this study reinforce the role of microglia activation regulating agents, in particular, JWH-133 and Eserine, in the brain dysfunction associated with endotoxemia.

Keywords: Sepsis; Cognitive; Behaviour; JWH-133; Eserine.

1042. A Study on the Effect of Cimetidine and L-Carnitine on Myoglobinuric Acute Kidney Injury in Male Rats

Suzanne Estaphan, Hassan Eissa, Samah Elattar, Laila Rashed and Mira Farouk

Myoglobinuric acute renal failure is the most important life threatening complication of rhabdomyolysis. Iron, free radicals, nitric oxide and cytochrome p450 are involved in the pathogenesis of mARF. The aim of this study is to compare the effect of cimetidine, l-carnitine and both agents together on mARF in rats. Forty rats were divided into 5 groups; group I: control rats, group II: myoglobinuric ARF rats, group III: mARF rats received l-carnitine (200 mg/kg, i.p.), group IV: mARF rats received cimetidine (150 mg/kg i.p.) and group V: mARF rats received both agents together. 48 h after glycerol injection, systolic blood pressure was measured. Urine and blood samples were collected to evaluate urine volume, GFR, BUN, creatinine,

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K, Na, serum creatine kinase, NO and glutathione levels. Kidney specimens were taken to investigate renal cytochrome p450 and for histological examinations. Cimetidine treatment significantly decreased creatinine, BUN, K, Na, SBP and creatine kinase and increased GFR and urine volume compared to group II. l-carnitine exerted similar changes except for the effect on K and GFR. NO was significantly decreased, while renal glutathione and cytochrome p450 were significantly increased in groups treated with l-carnitine or cimetidine as compared to group II. Combined treatment further improved renal functions, creatine kinase, oxidative stress parameters and SBP as compared to each therapy alone. The histological changes confirmed the biochemical findings. Cimetidine and l-carnitine have protective effects – almost equally – against mARF. Using both agents together, minimises the renal injury.

Keywords: Rhabdomyolysis; Acute kidney injury; Oxidative stress; Catalytic iron; L-carnitine; Cimetidine; Cytochrome P450.

1043. Effects of Ghrelin on Sepsis-induced Acute Kidney Injury: One Step Forward

Akef Khowailed, Sandra Mourad Younan, Hend Ashour, Abd Elkarim Kamel and Nivin Sharawy

Background Among the several disorders induced by sepsis, acute kidney injury (AKI) represents the most important economic burden problem that is associated with high mortality and morbidity rates. The aim of this study was to investigate the anti-inflammatory effects of ghrelin in sepsis-induced AKI and the possible role of vagus nerve.
Methods Five groups were included: sham, cecal ligation and puncture (CLP), CLP–ghrelin, CLP–vagotomy and CLP–vagotomy–ghrelin group.
Results Ghrelin treatment immediately after induction of CLP, significantly improved renal Glomerular filtration rate (GFR), serum creatinine, BUN and renal necrosis score as compared to the unprotected CLP group. In addition,
ghrelin significantly decreased renal TNF alpha (111.5 ± 10.35 vs. 291.8 ± 15.8 pg/mg ptn), VCAM1 (6.28 ± 1.7 vs. 12.9 ± 1.2 l/g ptn) and MPO (0.95 ± 0.13 vs. 2.5 ± 0.4 l/g ptn) without significant increase in renal IL-10. Those effects were abolished by vagotomy.
Conclusion We concluded that ghrelin could represent new therapeutic window in early treatment of sepsisinduced
AKI and this could be mainly due to its anti-inflammatory effects.
Keywords: Acute kidney injury; Cytokine; MPO; Ghrelin; Sepsis.

1044. Evaluation of Multi-Neuroprotective Effects of Erythropoietin Using Cisplatin Induced Peripheral Neurotoxicity Model

Nivin Sharawya, Laila Rashed and Magdy Fouad Youakim

Cisplatin (CDDP) is severely neurotoxic anti-neoplastic drug that causes peripheral neuropathies with clinical signs known as chemotherapy-induced peripheral neurotoxicity. The ameliorating effects of erythropoeitin on cisplatin-induced neuropathy, which

seem to be mediated by enhancing the cell resistance to side effects of cisplatin rather than by influencing the formation or repair rates of cisplatin-induced cross-links in the nuclear DNA, had been previously reported. The main objective of our study is to investigate the roles of nitro-oxidative stress, nuclear factor kappa B (NFκB) gene expressions and TNF levels on the previous reported erythropoietin anti-apoptotic neuroprotective effects during cisplatin induced neurotoxicity. The present study compared the effects of erythropoietin (50 µg/kg/d thrice weekly) on cisplatin (2 mg/kg/d i.p. twice weekly for 4 weeks) induced neurophysiologic changes and the associated changes in the inflammatory mediators (TNF alpha and NFKB), oxidative stress (malondialdehyde (MDA), superoxide dismutases (SOD) and glutathione) and gene expression of both neuronal nitric oxide synthase (nNOS) and inducible nitric oxide synthase (iNOS). In addition, sciatic nerve pro-apoptotic and anti-apoptotic indicators (Bcl, Bax, Caspase 3) were measured. We found that concomitant administration of erythropoietin significantly reversed the cisplatin induced nitro-oxidative stress – with significant increases in sciatic nerve glutathione and superoxide dismutase antioxidant enzyme levels and a significant decrease in iNOS gene expression. We conclude that erythropoietin anti-apoptotic neuro-protective effects could partially contribute to observed antioxidant effects of erthropoietin.

Keywords: Cisplatin; Erythropoietin; Oxidative; Inflammatory; Apoptosis.

Dept. of Psychology

1045. Impact of Political Violence on the Mental Health of School Children in Egypt

Suaad Moussa, Monira El Kholy, Dalia Enaba, Khadiga Salem, Asmaa Ali, Mohamed Nasreldin, Mohamed Gabal, Maha Emadeldine and Hamdy F. Moselhy

Background: Since the beginning of the Egyptian political conflict, Tahrir Square has been the epicentre of intense political violence. Students attending schools located near this square witnessed and/or directly experienced the consequences of a series of violent events.
Aim: This study will investigate the presence of psychiatric symptoms in children attending these schools to explore patterns of responses according to their perceptions of the revolution on their lives, adjusted for, gender and socio-economic status.
Method: A descriptive cross-sectional study conducted with 515 Egyptian school children attending government, experimental, and private language schools located within 1 km of Tahrir Square. To assess psychiatric symptoms in these children, a specially designed questionnaire was used to detect, depression, anxiety, and post-traumatic stress disorder (PTSD) symptoms and impairments.
Results: Children attending schools near Tahrir Square showed high rates of depression, PTSD and anxiety symptoms. The risk factors identified for developing psychiatric symptoms were a negative perception of the effect of the revolution, knowing someone exposed to trauma during the events, female gender and low socio-economic class.
Discussion: These Results highlight the need for large-scale studies to explore the consequences of ongoing political violence

on children and to establish baseline data on the mental health of Egyptian children.

Keywords: Anxiety; Depression; Egypt; PTSD; Political conflict; Violence.

1046. Role of Traditional Healers in the Pathway to Care of Patients with Bipolar Disorder in Egypt

Tarek Assad, Tarek Okasha, Hisham Ramy, Tamer Goueli, Hanan El-Shinnawy, Mohamed Nasr, Heba Fathy, Dalia Enaba, Dina Ibrahim, Mahmoud Elhabiby, Nesreen Mohsen, Sherien Khalil, Mohamed Fekry, Nivert Zaki, Hani Hamed, Hanan Azzam, Marwa A Meguid, Menan AbdelMaksoud Rabie, Marwa Sultan, Soheir Elghoneimy, Osama Refaat, Doaa Nader, Doha Elserafi, Marwa Elmissiry and Iman Shorab

Background: A large number of mentally ill patients prefer to visit non-medical practitioners such as traditional healers because of the confidence in the system, affordability and accessibility of the service. This may lead to delay in seeking psychiatric services and has prognostic impact. Aim: To assess the rate of bipolar affective disorder (BAD) patients seeking traditional healers, the sociodemographic and clinical correlates of those patients.

Methods: We assessed 350 patients with BAD after confirmation of diagnosis with Structured Clinical Interview for DSM-IV Axis I Disorder (SCID-I) research version and assessment of functioning with Global Assessment of Functioning scale. They were assessed for percent, rate and timing of seeking traditional healers.

Results: In all, 40.8% sought traditional healers, with 34.9% more than four times. Of those, 62.2% were before seeking psychiatric services and 37.8% after. Lower educational level, less impairment of functioning and presence of hallucinations were significant correlates.

Conclusion: This study shows that most of the patients suffering from mental illness prefer to approach faith healers first, which may delay entry to psychiatric care and thereby negatively impact the prognosis of BAD. This highlights the importance of mental health education and developing a positive collaborative relationship with traditional healers.

Keywords: Traditional healers; Bipolar patients; Pathway to care.

1047. Impact of Depression on Pathologic Internet use Among Intern Doctors of Cairo Universityhospital (Kasral-Ainy)

Maha Wasfi Mobasher, Ashraf Adel Fouad Dalia Ahmed Enaba, Kareem Shawky and Hamdy F. Moselhy

Introduction: Thegrowthoftheinternethasimpactedalmostevery facet of life in the world. In most cases, utilization of theinternethasimprovedpeople'slives.However, in some cases excessive use of the internet has been linked to significant impairment in critical areas of functioning.

Aim of the Work: To determine the prevalence of pathologic use of the internet and verify whether there is a relation between this problem and the depressive disorders among Intern doctors working in Cairo University hospital.

Subjects and Methods: A total of 300 Intern doctors of Cairo University hospitals were included. The Internet Addiction Test was used to measure pathologic intent use. Present State Examination-10 was used for screening of depressive symptoms and Beck Depression Inventory to determine the severity of depression. The Internet Application Checklist was used to determine internet usage patterns of the subjects.

Results: More than half of the sample (54.0%) consisted of pathologic internet users. Only 12.3% comprised moderate/severe pathologic internet users. Severe forms of pathologic internet use were more prevalent in male individuals than in female individuals. Pathologic internet users were more associated with depressive symptoms and depressive disorders than nonpathologic internet users.

Conclusions: There were significant positive correlations among internet addiction, depressive symptoms, and depressive disorders in fresh graduate Cairo University Intern doctors. As there is a potential harmful behavior among new graduate doctors, health professionals need to be aware of measures and procedures for the assessment of internet addiction and depression.

Keywords: Pathologic internet use; Depression; Depressive disorders.

1048. The Influence of A118g Single Nucleotide Polymorphism of Human Mu Opioid Receptor Gene and the MDR1 Gene in Egyptian Patients with Tramadol Induced Seizure

Dalia Enaba, Nevin M. Shalaby, Heba El-Baz, Amr Zahra, Nirmeen A. Kishk and Hamdy F. Moselhy

Objectives: Although seizures have been reported with tramadol use, the exact mechanism is not yet confirmed. An individual genetic susceptibility may have a role in developing seizures.Thepurpose of thisstudywasto investigate the frequency of mutant allele of the OPRM A118G and MDR1 C3534T in tramadol users with seizures.

Methods: After investigators obtained informed consent and when other causes of seizures were excluded, 74 Egyptian tramadol users, with and without seizures, were assessed clinically, radiologically, and by electroencephalogram. Their blood samples were genotyped for the l-opioid receptor gene and the multidrug resistant (MDR1) genes.

Results: Thirty-seven subjects had seizures. A history of head trauma and more opioid use were reported by the group with seizures. Family history of epilepsy was present in 2 subjects with seizures. There was no significant difference between the 2 groups with regard to the frequency of occurrence of the SNP A118G of the mu opioid receptor gene or the SNP C3435T of the MDR1 gene.

Conclusions: This study could not illustrate a potential genetic background in the studied point mutations that could explain the development of tramadol-induced seizures.

Keywords: Tramadol; Seizure; Mutant allele; OPRM; MDR1.

Medicine Sector

Dept. of Public Health

1049. Secondhand Smoke in Waterpipe Tobacco Venues in Istanbul, Moscow, and Cairo

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Objective The prevalence of waterpipe tobacco smoking has risen in recent decades. Controlled studies suggest that waterpipe secondhand smoke (SHS) contains similar or greater quantities of toxicants than cigarette SHS, which causes significant morbidity and mortality. Few studies have examined SHS from waterpipe tobacco in real-world settings. The purpose of this study was to quantify SHS exposure levels and describe the characteristics of waterpipe tobacco venues.

Methods: In 2012-2014, we conducted cross-sectional surveys of 46 waterpipe tobacco venues (9 in Istanbul, 17 in Moscow, and 20 in Cairo). We administered venue questionnaires, conducted venue observations, and sampled indoor air particulate matter (PM2.5) (N=35), carbon monoxide (CO) (N=23), particle-bound polycyclic aromatic hydrocarbons (p-PAHs) (N=31), 4-methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) (N=43), and air nicotine (N=46).

Results: Venue characteristics and SHS concentrations were highly variable within and between cities. Overall, we observed a mean (standard deviation (SD)) of 5 (5) waterpipe smokers and 5 (3) cigarette smokers per venue. The overall median (25th percentile, 75th percentile) of venue mean air concentrations was 136 (82, 213) µg/m(3) for PM2.5, 3.9 (1.7, 22) ppm for CO, 68 (33, 121) ng/m(3) for p-PAHs, 1.0 (0.5, 1.9) ng/m(3) for NNK, and 5.3 (0.7, 14) µg/m(3) for nicotine. PM2.5, CO, and p-PAHs concentrations were generally higher in venues with more waterpipe smokers and cigarette smokers, although associations were not statistically significant.

Conclusion: High concentrations of SHS constituents known to cause health effects indicate that indoor air quality in waterpipe tobacco venues may adversely affect the health of employees and customers.

Keywords: Indoor air pollution; Secondhand smoke; Tobacco smoke pollution; Waterpipe smoking.

1050. Viral Transmission Risk Factors in an Egyptian Population with High Hepatitis C Prevalence

Mary Kate Mohlman, Doa'a A. Saleh, Sameera Ezzat, Mohamed Abdel-Hamid, Brent Korba, Kirti Shetty, Sania Amr and Christopher A. Loffredo

Background: Egypt has the world's highest prevalence of infection with hepatitis C virus (HCV), which is a major cause of hepatocellular carcinoma. The high HCV prevalence is largely attributed to the parenteral antischistosomal therapy (PAT) campaigns conducted from the 1950s through the 1980s; however, the primary modes of transmission in the post-PAT period are not well known. In this study we examined the associations between HCV prevalence and exposures to risk factors, including PAT, in a high HCV prevalence population.

Methods: Using a cross-sectional design, we examined the associations between demographic characteristics and risk factors for HCV transmission and HCV positivity prevalence among a sample of Egyptian residents. Data were collected through an interview-administered survey, and the association estimates were determined using X^2 and logistic regression.

Results: The highest HCV positivity prevalence was observed in cohorts born before 1960, and declined precipitously thereafter; whereas the proportion of subjects reporting PAT remained relatively stable. Being male, having a rural residence, and having received PAT were all associated with HCV positivity; however, PAT alone could not account for the high prevalence of HCV.

Conclusions: In Egypt, PAT and other transmission factors yet to be identified, as well as cohorts born before the 1960s and infected with HCV, are most likely the main contributors to the current HCV endemic.

Keywords: HCV; Egypt; Prevalence; Transmission.

1051. Substance use by Egyptian Youth: Current Patterns and Potential Avenues for Prevention

Christopher A. Loffredo, Dina N. K. Boulos, Doa'a A. Saleh, Irene A. Jillson, Magdy Garas, Nasser Loza, Philip Samuel, Yousri Edward Shaker, Mar-Jan Ostrowski and Sania Amr

Background. Substance abuse in Egypt is a serious public health threat. Recent studies have demonstrated increases in the prevalence of the use of tobacco, illegal drugs, and over-the-counter drugs, particularly among youth.

Methods. We conducted focus groups with a total of 40 male and female youth participants, ages 12–14 and 15–18, recruited from two different areas (Cairo and Alexandria) in 2012. We investigated their knowledge and perceptions regarding current substance use, its sources, and promoting and protecting factors, broadly addressing the use of tobacco products, illicit and prescription drugs, inhaled substances such as glue and solvents, and alcohol.

Results. Our findings suggest that: (1) youth in Egypt had access to and were actively using substances encountered in similar research worldwide, including tobacco, alcohol, illicit drugs, glue sniffing, and pharmaceutical agents; (2) smoking cigarettes and using hashish were themost common practices, and Tramadol was the most commonly used pharmaceutical drug; (3) peer pressure from friends stood out as the most common reason to start and continue using substances, followed by adverse life events and having a parent or family member who used substances; (4) strict parenting, religiosity, and having non-user friends were among the factors perceived by youth to prevent substance use or help them quit using substances; (5)most youthswere aware of the adverse health effects of substance use.

Conclusion. These findings will inform the design of quantitative surveys aimed at estimating the prevalence of specific behaviors related to substance use among youth and potential avenues for prevention.

Keywords: Substance use; Youth; Drugs; Smoking; Focus groups.

1052. Preventing Hepatocellular Carcinoma in Egypt: Results of A Pilot Health Education Intervention Study

Doa'a A. Saleh, Sania Amr, Irene A. Jillson, Judy Huei‑yu Wang, Nancy Crowell and Christopher A. Loffredo

Background: Hepatocellular carcinoma (HCC), one of the most fatal malignancies, is particularly prevalent in Egypt, where we previously found deficiencies in knowledge concerning HCC and its risk factors. Hepatitis B and C viral infections are highly prevalent in Egypt, pesticides are very commonly used, and diets are often contaminated by aflatoxin, especially in rural areas.

Methods: We conducted a study to pilot test a health education intervention addressing HCC, its risk factors, and its main modes of prevention. It included four health education modules: HCC, hepatitis viruses, pesticides and aflatoxin. We used a pre- and post-intervention set of questionnaires to assess knowledge gained by the participants.

Results: A total of 25 participants from a village in the Nile Delta area attended the health education session and completed the questionnaires. The education intervention significantly increased the participants' knowledge on HCC and its risk factors, particularly regarding the use of pesticides at home and aflatoxin contaminated foods (both p < 0.05). Overall, there was a 12 % increase in the number of participants who believed that HCC could be prevented, and they reported their intention to practice prevention for HCC risk factors.

Conclusions: We found that the education intervention we pilot tested was feasible and proved effective in increasing participants' knowledge. Future efforts should focus on implementing targeted education programs in high-risk populations in Egypt.

Keywords: Liver cancer; Prevention; Hepatitis C virus; Aflatoxin; Pesticides.

Dept. of Rheumatology

1053. Th1/Th2/Th17/Treg Cytokine Imbalance in Systemic Lupus Erythematosus (SLE) Patients: Correlation with Disease Activity

Roba M. Talaat, Sara F. Mohamed, Iman H. Bassyouni and Ahmed A. Raouf

Aim: Imbalance of T-helper-cell (TH) subsets (TH1/TH2/TH17) and regulatory T-cells (Tregs) is suggested to contribute to the pathogenesis of Systemic lupus erythematosus (SLE). Therefore, we evaluated their cytokine secretion profile in SLE patients and their possible association with disease activity.

Methods: Sixty SLE patients, 24 rheumatoid arthritis (RA) patients and 24 healthy volunteers were included in this study. Demographic, clinical, disease activity and serological data were prospectively assessed. Plasma cytokines levels of TH1 (IL-12, IFN-c), TH2 (IL-4, IL-6, IL-10), TH17 (IL-17, IL-23) and Treg (IL-10 and TGF-b) were measured by enzyme linked immunosorbent assays (ELISA).

Results: SLE patients were found to have significantly higher levels of IL-17 (p < 0.001), IL-6 (p < 0.01), IL-12 (p < 0.001) and IL-10 (p < 0.05) but comparable levels of IL-23 and IL-4 and

slight reduction (but statistically insignificant) of TGF-b levels compared to controls. IL-6, IL-10 and IL-17 were significantly increased (p < 0.05) with disease activity. The RA group exhibited significantly higher levels of plasma IL-4 (p < 0.01), IL-6 (p < 0.05), IL-17 (p < 0.001), IL-23 (p < 0.01) and TGF-b (p < 0.5) and lower IFN-c (p < 0.001) and IL-10 (p < 0.01) than those of healthy subjects.

Conclusion: Our study showed a distinct profile of cytokine imbalance in SLE patients. Reduction in IFN-c (TH1) and TGF-b1 (Treg) with the elevation in IL-6 and IL-17 (TH17) could imply skewing of T-cells toward TH17 cells. Breaking TH17/Treg balance in peripheral blood may play an important role in the development of SLE and could be responsible for an increased pro-inflammatory response especially in the active form of the disease.

Keywords: Cytokines; Rheumatoid arthritis; Systemic lupus erythematosus; T-Regulatory cells; TH17

1054. Renal Outcomes Among Egyptian Lupus Nephritis Patients: A Retrospective Analysis of 135 Cases from A Single Centre

G A Mahmoud, H S Zayed and S A Ghoniem

Objectives: The objective of this paper is to describe renal outcomes in a group of Egyptian patients with lupus nephritis and to identify variable prognostic factors.

Patients and methods: The records of 135 patients (129 females, six males) with biopsy-proven lupus nephritis seen between 1999 and 2011 at Kasr Al-Aini Hospital, Cairo University, were reviewed and included in a retrospective analysis. Biopsies were classified according to the WHO classification. Renal outcomes were defined according to the Renal Subcommittee of Renal Insufficiency of the American College of Rheumatology.

Results: The mean follow-up period was 55.64_25.68 (range 4–156) months. Thirty-nine patients (29.9%) developed an adverse final outcome. This composite outcome, defined as persistent elevation of serum creatinine ≥1.2 mg/dl, chronic renal insufficiency, end-stage renal disease or death, was seen in 12 (8.9%), seven (5.2%), three (2.2%) and 17 (12.6%) patients, respectively. The overall patient survival was 93.5% and 87.5% at five and 10 years, respectively. Factors associated with an adverse outcome included male gender (p¼0.037), hypertension at nephritis onset (p¼0.001), serum creatinine ≥1.2 mg/dl (p<0.001), urinary casts (p¼0.006), anticardiolipin antibodies (p¼0.03), class IV nephritis (p<0.001), hyaline thrombosis (0.003), glomerular sclerosis (p¼0.002), tubular atrophy(p<0.001), interstitial fibrosis (p<0.001) and a higher chronicity index (p¼0.006). Time-dependent factors associated with an adverse outcome included failure to achieve remission within the first year, uncontrolled hypertension, persistently low C3 and development of flares (p¼0.003,<0.001, ¼ 0.004, ¼ 0.003, respectively).

Conclusion: The association of several adverse prognostic factors with the development of poor renal outcome has been confirmed in this study.

Keywords: Lupus nephritis; Outcome; Prognostic factors; Egyptians.

Medicine Sector

1055. Anti-C1q in Chronic Hepatitis C Virus Genotype Iv Infection: Association with Autoimmune Rheumatologic Manifestations

Samia H. Fadda, Iman H. Bassyouni, Ahmed Hamdy, Nermeen A. Foad and Iman E. Wali

A growing body of evidence suggests that anti-complement-1q (anti-C1q) antibodies are elevated in a variety of autoimmune disease. Therefore, we investigated their prevalence and clinical significance in plasma of patients with hepatitis C virus (HCV) genotype IV in the presence and absence of autoimmune extra hepatic manifestations in comparison to normal healthy individuals. Plasma Anti-C1q Abs levels were assessed by an Enzyme Linked Immunosorbant Assay in 91 chronic HCV-infected patients (51 with and 40 without autoimmune rheumatic manifestations) and 40 healthy volunteers matched for age and gender. Epidemiological, clinical, immunochemical and virological data were prospectively collected. Positive Anti-C1q antibodies were more frequent among HCV patients with extra-hepatic autoimmune involvement, than those without and healthy control subjects. No significant correlations were found between Anti-C1q levels with either the liver activity or the fibrosis scores. In HCV-patients with autoimmune involvements, plasma Anti-C1q levels were significantly higher in patients with positive cryoglobulin, and in those with lymphoma than in those without. These Results were confirmed by multivariate analysis. Further large scale longitudinal studies are required to assess and clarify the significance and the pathogenic role of anti-C1q antibodies among HCV infected patients with positive cryoglobulinaemia and lymphoma.

Keywords: Anti-C1q antibodies; Hepatitis C virus; Cryoglobulinaemia; Lymphoma.

1056. Challenges and Opportunities in the Early Diagnosis and Optimal Management of Rheumatoid Arthritis in Africa and the Middle East

Hussein Halabi, Abdurhman Alarfaj, Khaldoon Alawneh, Soliman Alballa, Khalid Alsaeid, Humeira Badsha, Romela Benitha, Elyes Bouajina, Samar Al Emadi, Ayman El Garf, Khaled El Hadidi, Ahmed Laatar, Chafia D. Makhloufi, Abdel F. Masri, Jeanine Menassa, Ahmed Al Shaikh, Ramiz Al Swailem and Maxime Dougados

Early diagnosis and early initiation of disease-modifying antirheumatic drug (DMARD) therapy slow the progression of joint damage and decrease the morbidity and mortality associated with rheumatoid arthritis (RA). According to the European League Against Rheumatism (EULAR) guidelines, treatment should be initiated with methotrexate and addition of biological DMARDs such as tumour necrosis factor (TNF) inhibitors should be considered for RA patients who respond insufficiently to methotrexate and/or other synthetic DMARDs and have poor prognostic factors. Africa and the Middle East is a large geographical region with varying treatment practices and standards of care in RA. Existing data show that patients with RA in the region are often diagnosed late, present with active disease and often do not receive DMARDs early in the course of the disease. In this review, we discuss the value of early diagnosis and remission-targeted treatment for limiting joint damage and improving disease outcomes in RA, and the challenges in adopting these strategies in Africa and the Middle East. In addition, we propose an action plan to improve the overall long-term outlook for RA patients in the region.

Keywords: Africa and Middle East; Early diagnosis; Low disease activity; Remission; Rheumatoid arthritis.

1057. Subclinical Atherosclerosis in Systemic Lupus Erythematosus Patients and its Relationship to Disease Activity and Damage Indices

S. Fadda, H. Nassar, S. M. Gamal and H. Al-azizi

Aim of The Work: To detect the incidence of premature atherosclerosis in systemic lupus erythematosus (SLE) patients and to study its association with disease activity and damage indices.

Patients And Methods: This study involved 50 adult female SLE patients with mean age 26.24 ± 8.63 years and mean disease duration 3.44 ± 4.01 years. The control group comprised 25 healthy adult females. All patients were subjected to a detailed clinical examination and laboratory investigations, and full case history was recorded. Assessment of disease activity was performed according to the Systemic Lupus Erythematosus Disease Activity Index (SLEDAI) and disease damage was assessed using the Systemic Lupus International Collaborating Clinics (SLICC) score. B mode ultrasound was used to measure the intima-media wall thickness (IMT) and detect the presence of carotid plaques.

Results: In 15 patients (30%), positive ultrasonographic findings represented by a significant increase in IMT (>0.9 mm) could be shown; plaques were found in 3 of these patients (6%). A significant difference was found between SLE patients and controls in terms of IMT (P< 0.0001). On subgrouping the SLE patients according to their IMT, there was a significant difference between those with thickened and normal IMT in terms of SLEDAI (P<0.0001) and SLICC (p=0.035) scores.

Conclusion: Subclinical atherosclerosis is frequent in SLE patients. Increased disease activity and damage are associated with the occurrence of premature atherosclerosis.

Keywords: Cardiovascular disease; Carotid artery; Common; systemic lupus international collaborating clinics; Systemic lupus erythematosus disease activity index; Intima–media thickness.

1058. Subclinical Sacroiliitis in Brucellosis. Clinical Presentation and MRI Findings

T.A. Gheita, S. Sayed, G.S. Azkalany, H.S. El Fishawy, M.A. Aboul-Ezz, M.H. Shaaban and R.H. Bassyouni

Purpose: The aim of this work was to detect subclinical sacroiliac joint involvement in patients with brucellosis and study their clinical and laboratory features.

Patients and Methods: The study included 100 brucellosis patients being followed-up in the Gastroenterology and Hepatology Unit, Theodor Bilharz Research Institute and Cairo University outpatient clinics. A thorough history, physical

examination, routine laboratory tests, and abdominal ultrasound were obtained for all patients. Extended rheumatological examination was performed including clinical testing for sacroiliitis and enthesitis. None of the patients reported a history of back pain or any symptoms suggestive of sacroiliitis during the course of the infection. Plain x-ray and MRI scan of the sacroiliac joints were performed for all patients.

Results: Asymptomatic sacroiliitis was present in 24% of the brucellosis patients; none of the patients had tenderness over their spine with preserved lumbar spine mobility. Sacroiliitis was mainly unilateral being bilateral in 20.83%. There was an obvious relationship with animal contact and occupation of the patients. Osteoarticular involvement was common (67%) including arthralgias, arthritis, myalgias, spondylitis, enthesitis and bursitis, being clearly higher in those with sacroiliitis. The MRI scan showed blurring of the margins in 66.67%, widening in 25%, narrowing in 54.17%, erosions in 20.83%, and sclerosis in 12.5%.

Conclusion: Osteoarticular manifestations of brucellosis are prevalent and subclinical sacroiliitis is evident, a finding that may classify these patients as having brucellar spondyloarthropathy (BSA). Referring brucellosis patients for rheumatological assessment has the advantage of early assessment of asymptomatic cases with sacroiliitis which is commonly overlooked.

Keywords: Spondyloarthropathies; Subclinical sacroiliitis; Autoimmune diseases; Rheumatology; Spondylarthritis.

1059. Serum Sclerostin Level Among Egyptian Rheumatoid Arthritis Patients: Relation to Disease Activity, Bone Mineral Density and Radiological Grading

Mehaney D A, Eissa M, Anwar S and Fakhr El-Din S

Introduction: Bone loss in rheumatoid arthritis is caused by increased bone resorption without an increment in bone formation. The Wnt pathway is important in the control of bone formation through the re - gulation of osteoblast activity. Sclerostin is an important regulator of the Wnt pathway by blocking Wnt bindin g to its receptor and thereby inhibiting bone formation. Aim: This study aimed to assess the serum sclerostin level in a group of Egyptian rheumatoid arthritis patients and to correlate its level with bone mineral density, disease activity and radiological grading.

Methods: Forty rheumatoid arthritis patients (mean age 48.9 ± 11.6 years, disease duration 8 ± 6.4 years) and 40 age and sex matched apparently healthy subjects were included. Serum sclerostin level was measured using enzyme linked immunosorbent assay. Plain radiographs of hands and feet and dual-energy x-ray absorptiometry test were done for all patients.

Results: No significant difference was found between rheumatoid arthritis patients and healthy controls regarding the mean value of sclerostin level. Postmenopausal healthy women had higher levels of sclerostin than premenopausal healthy women. Serum sclerostin had significantly positive correlations with the age of onset and weight of rheumatoid arthritis patients and negative correlation with erythrocyte sedimentation rate. No correlation was encountered between sclerostin le vel and bone mineral density, disease activity or radiographic grading.

Conclusion: For better clarification of the role of scleros - tin on bone mass in rheumatoid arthritis, larger sample size is needed.

More studies on serum sclerostin le vels among different grades of RA activity are encouraged.

Keywords: Sclerostin; Bone loss; Rheumatoid arthritis.

1060. Clinical Significance of Matrix Metalloproteinase-3 in Systemic Lupus Erythematosus Patients: A Potential Biomarker for Disease Activity and Damage

Tamer A. Gheita, Dalia M Abdel Rehim, Sanaa A Kenawy and Heba A Gheita

Objectives: To assess the serum level of matrix metalloproteinase-3 (MMP-3) in systemic lupus erythematosus (SLE) patients and correlate it with clinical manifestations, laboratory findings, disease activity and damage.

Methods: Forty-two female SLE patients were included in the present study. Full history taking, thorough examination and investigations were performed. Disease activity was assessed using the SLE Disease Activity Index (SLEDAI). Furthermore, Systemic Lupus International Collaborating Clinics /American College of Rheumatology damage index (SLICC/ACR DI) was also assessed. Renal biopsy was done in those with lupus nephritis. Thirty age and sex matched subjects were included as control. Serum MMP-3 was measured by ELISA.

Results: The mean serum MMP-3 level in SLE patients was significantly higher (80.9±45.8 ng/ml) than in the control (10.01±2.6 ng/ml) (p <0.0001). The level in patients with arthritis, nephritis or hematologic disorders were significantly higher than in those without (p<0.0001, p=0.02 and p=0.04 respectively). The MMP-3 was significantly different among the subclasses of renal biopsy (p=0.01) being higher in those with class IV (137.5±45.6 ng/ml). It significantly correlated with the SLEDAI, SLICC, white blood cells and platelet counts (r=0.37, p=0.02; r=0.36, p=0.02; r=0.32, p 0.04 and r=0.38, p=0.01 respectively). On linear regression analysis with age, disease duration and body mass index as independent factors, the SLEDAI and SLICC were not significant predictors.

Conclusion: Serum MMP-3 was found to be high in SLE patients and associated with arthritis, nephritis and hematological manifestations. MMP-3 correlated with disease activity and damage making it a possible biomarker, and its measure of considerable interest, related to the potential therapeutic responses and disease outcome.

Keywords: MMP-3; Arthritis; Nephritis; SLE; SLEDAI; SLICC.

1061. Impact of Smoking on Disease Outcome in Ankylosing Spondylitis Patients

Wafaa Gaber, Ahmed S. Hassen, Ihab Ibrahim Abouleyoun and Zeinab O. Nawito

Introduction Smoking was associated with an earlier onset of back pain, higher disease activity, worse functional status and quality of life in patients with AS. Aim of the work To detect the relationship between smoking and disease outcome measures in AS patients.

Patients and Methods A total of 30 patients with disease duration of 9.6 ± 5.8 years. They were divided into 2 groups

according to their smoking status, the mean age of non-smokers 11/30 patients (36.7%) and smokers 19/30 patients (63.3%) was (29 ± 8.4 years vs 34.9 ± 8.1 years respectively) and their disease duration was (6.6 ± 3.9 years vs 8.3 ± 6.1 years respectively). **Results** The smokers showed longer morning stiffness duration (p = 0.02), less spinal mobility (p = 0.02) and less chest expansion (p = 0.02). Also they had a higher disease activity index (BASDAI) (p = 0.03) and poorer quality of life index (ASQL) (p = 0.03), while there was no statistically significant difference between the 2 groups regarding the physical activity index (BASFI) (p = 0.07). There was a positive significant correlation between smoking duration and age (p < 0.001, r = 0.9). Disease duration was found to be a significant independent risk factor for the decrease of chest expansion (p = 0.04).

Conclusion This study proved some of the adverse effects of smoking on ankylosing spondylitis patients mainly on the domains of disease activity and quality of life. So we recommend the cessation of smoking in every AS patient as part of the treatment plan.

Keywords: Ankylosing spondylitis; Smoking; BASDI; BASFI; ASQL.

1062. Clinical Significance of Serum TNFa and -308 G/A Promoter Polymorphism in Rheumatoid Arthritis

Tamer A. Gheita, Ghada S. Azkalany, Wafaa Gaber and Abeer Mohey

The Egyptian Rheumatologist, 37(2): 49-54 (2015)

Aim of the work: To evaluate the clinical significance of serum levels of tumor necrosis factor alpha (TNFa) and -308 G/A promoter polymorphism in rheumatoid arthritis (RA) patients.

Patients and Methods: We studied 43 RA patients and 30 controls. Demographic, clinical and serological data were prospectively evaluated. Disease activity score (DAS28) and the Health Assessment Questionnaire (HAQ) were assessed. Serum TNF-a level was measured and promoter (-308 G/A) genotyped.

Results: Serum TNF-a level was significantly higher in the RA patients compared to controls (p = 0.036) and was significantly higher in those with AA promoter polymorphism who had a significantly younger age at disease onset. In the multivariate analysis, disease duration would predict the TNFa level (p = 0.006) while age at disease onset, DAS28 and HAQ would predict the TNFa polymorphism (p = 0.004, p = 0.04 and p = 0.03 respectively). A significant negative correlation was present between TNFa level with age (p = 0.001) and age at disease onset (p < 0.0001) while in those with GA genotype a significant negative correlation was present with DAS28 (r = 0.66, p = 0.038).

Conclusion: Serum TNFa levels and -308 G/A promoter polymorphism were higher in RA patients than in controls and could be predicted by disease activity and HAQ.

Keywords: Rheumatoid arthritis; TNF-A -308 G/A promoter polymorphism; Tumor necrosis factor (TNFA)

1063. Predictive Potential of the Disease Activity Index and C-Reactive Protein for Infection in Systemic Lupus Erythematosus Patients

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The Egyptian Rheumatologist, 37: 171-175 (2015)

Aim of the work: The aim of the present work was to determine the prevalence of infections in a cohort of Egyptian Systemic lupus erythematosus (SLE) patients and to describe their sites and relation to clinical characteristics, laboratory features and disease activity.

Patients and Methods: Medical records of 250 Egyptian SLE patients attending the Rheumatology department, Cairo University hospitals were reviewed retrospectively for the clinical and laboratory features, SLE disease activity index (SLEDAI) and treatment received.

Results: Infection was found in 119 (47.6%) patients, with bacterial infection being the commonest in 99 (83%) followed by fungal infection in 30 (25%) and viral infection in 22 (18.5%). The commonest site of infection was the skin (37%) followed by the urinary tract (31%) and chest (19%). In SLE patients with infection there was a significant increase in the frequency of malar rash (p= 0.001), photosensitivity (p= 0.01), oral ulcers (p< 0.001), alopecia (p= 0.017) and Raynauds (p= 0.017) compared to those without infection. Pulmonary and neuropsychiatric manifestations were also significantly increased in those with infection (p=0.001 and p< 0.001). A significantly higher number of patients with infection were receiving pulse steroids (p=0.016), cyclophosphamide (p =0.011) and a higher oral prednisolone dose (p= 0.03). The SLEDAI was significantly higher (26.02± 8.23) in those with infection compared to those without (15.57± 6.43) (p< 0.001). C-reactive protein (CRP) was significantly higher in those with infection (p< 0.001). On performing a logistic regression analysis, only SLEDAI (p<0.001) and CRP (p< 0.001) were significant predictors of infection.

Conclusion: Disease activity and CRP are important predictors for infection in SLE patients.

Keywords: Systemic lupus erythematosus; Infection; Sledai; Egyptian.

1064. Clinical Significance of Bone Mineral Density in Ankylosing Spondylitis Patients: Relation to Disease Activity and Physical Function

Safaa Sayed, Hanan Darweesh, Khaled Fathy and Abdel Moneim Mourad

The Egyptian Rheumatologist, 37: 35-39 (2015)

Aim of the work: The aim of this work was to assess the bone mineral density (BMD) in Ankylosing Spondylitis (AS) patients and to investigate its relation with clinical and laboratory parameters, imaging of sacroiliac joints, disease activity and physical function.

Patients and Methods: 44 patients were recruited from the Rheumatology outpatient clinic of the Kasr El-Aini Hospital, their mean age was 33 ±8.7 years. Twenty age and sex matched subjects were included as controls. Dual energy X-ray absorptiometry (DEXA) was performed for the patients and control. Disease activity and physical function were assessed using the Bath AS Disease Activity Index (BASDAI) and Bath AS Functional Index (BASFI), respectively.

Results: The T-scores of the spine, hip and forearm were lower in patients compared to controls. Low BMD was more found among patients with chronic sacroiliitis. There were significant negative correlations between chin to chest and occiput to wall distance and BMD at the hip and forearm (both p<0.05). The BMD at the spine showed a significant correlation with the BASDAI (p= 0.008) and BASFI (p= 0.03). There was no correlation between BMD at any site and patients' age, disease duration, inflammatory back pain duration, modified Schö̈ber's test, fingerto- floor test and laboratory parameters.

Conclusion: The BMD was remarkably decreased at all measurement sites in AS patients. The BMD at the spine significantly negatively correlated with the disease activity and physical function. Bone loss in AS can be explained partly by the role of inflammatory mediators and partly as a consequence of reduced physical activity.

Keywords: Ankylosing spondylitis; DEXA; BMD; Osteoporosis; BASDAI; BASFI.

1065. Pattern of Primary Vasculitis with Peripheral Ischemic Manifestations: Report of A Case Series and Role of Vascular Surgery

Gheita T A, Samad H M, Mahdy M A and Kamel A B

Aim of the work: The aim of the present work was to study the role of vascular surgery in the management of primary vasculitis patients with peripheral ischemic manifestations.

Patients and Methods: Ten primary vasculitis patients with peripheral ischemic manifestations were studied and reviewed for the diagnosis, clinical manifestations, investigations, treatment options and role of vascular surgery. The Birmingham Vasculitis Activity Score (BVAS) was recorded.

Results: Giant cell arteritis was present in one patient; granulomatosis with polyangiitis in 5, essential cryoglobulinemic vasculitis in 3 and 1 (child) had Henoch–Schönlein purpura. They showed the following peripheral vascular manifestations: intermittent claudications, Raynauds, deep venous thrombosis and thrombophelebitis in 10% each; digital ulceration and trophic changes in 20% while acrocyanosis and dry gangrene were present in 30%. Renal involvement was present in 60% of patients. The mean BVAS was 11.5±6.57 at initial presentation. The disease activity remarkably improved over the disease course in all patients to be at their last visit (2.6±2.22) (p=0.002). Regarding the vascular surgery role in their management, in addition to their medical treatment, 40% required an additional surgical intervention. Two had a minor amputation of the toes; one performed thoracoscopic cervical sympathectomy and another needed tibial angioplasty.

Conclusion: Primary vasculitis patients presenting with peripheral ischemic manifestations require surgical attention. Their management is essentially medical and individualized to the diagnosis and presenting symptoms. Endovascular treatment may offer a safe and less invasive approach in high surgical risk patients. Sympathectomy is of high therapeutic potential in those with severe pain and trophic changes.

Keywords: Peripheral ischemia; Vasculitis; Vascular surgical procedures.

1066. Serum Cystatin C, Urinary Neutrophil Gelatinase-Associated Lipocalin and N-Acetyl-Beta-D-Glucosaminidase in Juvenile and Adult Patients with Systemic Lupus Erythematosus: Correlation with Clinical Manifestations, Disease Activity and Damage

Tamer A. Gheita, Abeer M. Nour El Din Abd El Baky, Heba S. Assal, Tarek M. Farid, Inas A. Rasheed and Eman H. Thabet

Lupus nephritis (LN) is a potentially devastating outcome of systemic lupus erythematosus (SLE). It is important to identify reliable, non-invasive Methods to assess the kidneys in patients with SLE. The aim of the study was to measure the level of novel markers of renal involvement in these patients and assess their correlation with disease activity and damage. Sixtyone patients with SLE (33 adults and 28 juvenile) were included in the study. Fifty-two ageand sex-matched healthy individuals served as controls. Full history taking, thorough clinical examination and laboratory investigations were performed and disease activity and damage were assessed for all patients. Renal bio-markers including serum cystatin C, urinary neutrophil gelatinase-associated lipocalin (UNGAL) and N-acetyl-beta-D-glucosaminidase (UNAG) were assessed in patients and controls. There was a significant increase in serum cystatin C, UNGAL and UNAG levels in the adult SLE patients compared with controls (P = 0.000, P = 0.013 and P = 0.018, respectively); serum cystatin C and UNGAL levels were higher in the juvenile patients compared with controls (P = 0.038 and P = 0.000, respectively). Serum cystatin C significantly correlated with the damage index, renal biopsy class and negatively with the serum albumin; UNGAL correlated with albuminuria and the level of nephritis and UNAG negatively correlated with serum albumin level. Our study suggests that serum cystatin C, UNGAL and UNAG are important markers of LN and both cystatin C and UNAG would help in predicting the renal biopsy class.

Keywords: UNGAL; UNAG; cystatin C; SLE; Sledai; Juvenile; Severity.

Dept. of Surgery

1067. The Ascending Aorta as An Exit Site for A Through-and-through Wire in TEVAR

Silke Brunkwall, Wael Ahmad, Spyridon Mylonas, Mohamed Sharkawy, Jens Wippermann and Jan Brunkwall

Purpose: To describe a technique for trans–ascending aorta through-and-through guidewire placement for thoracic endograft advancement and deployment.

Case Report: A 55-year-old man presented with a symptomatic pseudoaneurysm of the distal aortic arch after aortic coarctation open repair. He had also undergone mechanical aortic valve replacement. Planned were a left-sided carotid-subclavian bypass and a thoracic endovascular aortic repair with a chimney graft to the left common carotid artery. After carotid-subclavian bypass, efforts to retrograde cannulate the aortic arch and advance the thoracic endograft were unsuccessful. Because of the mechanical heart valve, no transapical approach could be used. Access to the ascending aorta was gained through a midline sternotomy. A through-and-through wire was positioned from the ascending aorta to femoral artery, which provided the required stability for advancement of the thoracic endograft. Sixmonth computed tomography documented patent endografts and carotid-subclavian bypass and no evidence of endoleak.

Conclusion: A trans–ascending aorta through-and-through guidewire is a feasible adjunct that can be added to the endovascular armamentarium when transcardiac or transbrachial approaches are impossible or ineffective.

Keywords: Aortic arch aneurysm; Aortic coarctation pseudoaneurysm; Stent-graft; thoracic aorta; Thoracic

endovascular aortic repair; Through-and-through guidewire; Vascular access.

1068. Can Sonography Distinguish A Supraorbital Notch from A Foramen?

Ravi K. Garg, Kenneth S. Lee, Sarah C. Kohn, Mustafa K. Baskaya and Ahmed M. Afifi

Journal of Ultrasound in Medicine, 34: 0-0 (2015) IF: 1.535

Diagnostic tools for evaluating the supraorbital rim in preparation for nerve decompression surgery in patients with chronic headaches are currently limited. We evaluated the use of sonography to diagnose the presence of a supraorbital notch or foramen in 11 cadaver orbits. Sonographic findings were assessed by dissecting cadaver orbits to determine whether a notch or foramen was present. Sonography correctly diagnosed the presence of a supraorbital notch in 7 of 7 cases and correctly diagnosed a supraorbital foramen in 4 of 4 cases. We found that sonography had 100% sensitivity in diagnosing a supraorbital notch and foramen. This tool may therefore be helpful in characterizing the supraorbital rim preoperatively and may influence the decision to use a transpalpebral or endoscopic approach for supraorbital nerve decompression as well as the decision to use local or general anesthesia.
Keywords: Head and neck ultrasound; Headache surgery; Musculoskeletal ultrasound; Supraorbital foramen; Supraorbital notch; Supraorbital rim.

1069. Is it Safe to Omit Neoadjuvant Chemo-radiation in Mucinous Rectal Carcinoma?

Khaled M. Madbouly, Abdrabou N. Mashhour and Waleed Omar

International Journal of Surgery, 23: 120-127 (2015) IF: 1.531

Background: Purpose was to compare the oncologic outcome of neoadjuvant chemoradiotherapy (nCXRT) versus postoperative chemoradiotherapy (pCXRT) for locally advanced mucinous rectal carcinoma (MRC) having curative total mesorectal excision (TME).
Methods: One hundred and two patients with MRC (T3-4 and/or N1-2) of middle and lower third rectum were included. Patients were non-randomly divided into 2 groups: Group A (N ¼ 61) had nCXRT followed by total mesorectal excision (TME) after 8e11 weeks and Group B (N ¼ 41) had TME followed by pCXRT. Primary end points were disease free survival (DFS) and overall survival (OS). Secondary endpoints were tumor regression grade (TRG) and morbidity.
Results: In group A, 29 patients had partial response after nCXRT, 26 patients showed no change and 6 patients had progression. TME was done in 55 patients in group A and 41 patients in group B. Six patients in group A turned to be unresectable after nCXRT due to progressive disease. Mean follow-up was 53 months. In patients received TME, Four-year DFS was higher in group A compared to group B yet not statistically significant (DFS 0.69 [95% CI 0.54e0.85] vs. 0.67 [95% CI 0.47e0.87]; P ¼ 0.39). However, actuarial 4 years OS was comparable in both groups (0.72 [95% CI 0.59e0.91] vs. 0.70 [95% CI 0.55e0.88]; P ¼ 0.46 in groups A and B respectively). Multivariate analysis revealed that age <40, and N2 were risk factors of recurrence.

Conclusion: Whilst accepting that the numbers are small, there was no statistical difference in outcome (DFS and OS) between patients receiving pre- or post-operative chemo-radiotherapy. In most MRC patients, tumor regression is not significant after nCXRT and there is considerable possibility of tumor progression during nCXRT treatment. So, nCXRT should be used with close follow-up in MRC for early detection of possible tumor progression. If the patient cannot tolerate nCXRT, it is possibly safe to do surgery followedby pCXRT. Prospective study is needed to study the value of nCXRT in MRC
Keywords: Mucinous carcinoma; Rectum; Neoadjuvant chemoradiation; Total mesorectal excision.

1070. A Novel Classification of Frontal Bone Fractures: the Prognostic Significance of Vertical Fracture Trajectory and Skull Base Extension

Ravi K. Garg, Ahmed M. Afifi, Jennifer Gassner, Michael J. Hartman, Glen Leverson, Timothy W. King, Michael L. Bentz and Lindell R. Gentry

Journal of Plastic, Reconstructive & Aesthetic Surgery, 68: 645-653 (2015) IF: 1.421

Purpose: The broad spectrum of frontal bone fractures, including those with orbital and skull base extension, is poorly understood. We propose a novel classification scheme for frontal bone fractures.
Methods: Maxillofacial CT scans of trauma patients were reviewed over a five year period, and frontal bone fractures were classified: Type 1: Frontal sinus fracture without vertical extension. Type 2: Vertical fracture through the orbit without frontal sinus involvement. Type 3: Vertical fracture through the frontal sinus without orbit involvement. Type 4: Vertical fracture through the frontal sinus and ipsilateral orbit. Type 5: Vertical fracture through the frontal sinus and contralateral or bilateral orbits. We also identified the depth of skull base extension, and performed a chart review to identify associated complications.
Results: 149 frontal bone fractures, including 51 non-vertical frontal sinus (Type 1, 34.2%) and 98 vertical (Types 2-5, 65.8%) fractures were identified. Vertical fractures penetrated the middle or posterior cranial fossa significantly more often than non-vertical fractures (62.2 v. 15.7%, p = 0.0001) and had a significantly higher mortality rate (18.4 v. 0%, p < 0.05). Vertical fractures with frontal sinus and orbital extension, and fractures that penetrated the middle or posterior cranial fossa had the strongest association with intracranial injuries, optic neuropathy, disability, and death (p < 0.05).
Conclusions: Vertical frontal bone fractures carry a worse prognosis than frontal bone fractures without a vertical pattern. In addition, vertical fractures with extension into the frontal sinus and orbit, or with extension into the middle or posterior cranial fossa have the highest complication rate and mortality.
Keywords: Craniomaxillofacial trauma; Frontal bone fracture; Frontal sinus fracture; Orbital fracture; Skull base trauma.

1071. Evaluating Current Functional Airway Surgery During Rhinoplasty: A Survey of the American Society of Plastic Surgeons

Ahmed M. Afifi, Steve J. Kempton, Chad R. Gordon, Landon Pryor, Ashraf A. Khalil, Walter M. Sweeney, Shashidhar Kusuma, Claude-Jean Langevin and James E. Zins

Background Despite numerous reports outlining technical modifications in rhinoplasty, few publications discuss the importance of the perioperative assessment and surgical management of the nasal airway. This study's objective is to increase awareness regarding the functional aspects of rhinoplasty surgery and to encourage surgeons to incorporate functional airway management into their rhinoplasty practice.

Methods A web-based survey was given to all members of the American Society of Plastic Surgeons (ASPS). Survey Results were analysed to determine if surgeons' experience, annual rhinoplasty volume, or postgraduate training affected their

Results. The relationship between surgeon satisfaction with the outcome of the airway management and the frequency of performing an inferior turbinate reduction was investigated. Results Of the 4,383 listed ASPS members, 671 (21 %) completed the web-based survey. Surgeons who performed a preoperative internal nasal exam were more satisfied with their Results (p = 0.016) and report lower rates of postoperative nasal airway obstruction (p = 0.054). Inferior turbinate reduction did correlate to postoperative satisfaction with the nasal airway (p < 0.001). Overall, 85 % of respondents were satisfied with their management of the nasal airway and 87 % of respondents agreed that there is a need for more instructional courses on this topic.

Conclusion There is considerable variation in the Results and techniques of assessment and treatment of the nasal airway. Rhinoplasty volume and inferior turbinate reduction are associated with surgeon satisfaction of management of the nasal airway. Functional airway considerations should be incorporated into routine rhinoplasty training, assessment, and treatment.

Keywords: Functional airway rhinoplasty nose plastic surgeon.

Dept. of Urology Dept

1072. The Impact of Low-dose Carcinogens and Environmental Disruptors on Tissue Invasion and Metastasis

Josiah Ochieng, Gladys N. Nangami, Olugbemiga Ogunkua, Isabelle R.Miousse, Igor Koturbash, Valerie Odero-Marah, Lisa McCawley, Pratima Nangia-Makker, Nuzhat Ahmed, Yunus Luqmani, Zhenbang Chen, Silvana Papagerakis, Gregory T.Wolf, Chenfang Dong, Binhua P.Zhou, Dustin G. Brown, Annamaria Colacci, Roslida A.Hamid, Chiara Mondello, Jayadev Raju, Elizabeth P. Ryan, Jordan Woodrick, Ivana Scovassi, Neetu Singh, Monica Vaccari, Rabindra Roy, Stefano Forte, Lorenzo Memeo, Hosni K.Salem, Amedeo Amedei, Rabeah Al-Temaimi, Fahd Al-Mulla,William H.Bisson and Sakina E. Eltom

The purpose of this review is to stimulate new ideas regarding low-dose environmental mixtures and carcinogens and their potential to promote invasion and metastasis. Whereas a number of chapters in this review are devoted to the role of lowdose environmental mixtures and carcinogens in the promotion of invasion and metastasis in specific tumors such as breast and prostate, the overarching theme is the role of low-dose carcinogens in the progression of cancer stem cells. It is becoming clearer that cancer stem cells in a tumor are the ones that assume invasive properties and colonize distant organs. Therefore,low-dose contaminants that trigger epithelial–mesenchymal transition, for example, in these cells are of particular interest in this review. This we hope will lead to the collaboration between scientists who have dedicated their professional life to the study of carcinogens and those whose interests are exclusively in the arena of tissue invasion and metastasis.

Keywords: Environmental disruptors; Tissue invasion; Metastasis.

1073. Metabolic Reprogramming and Dysregulated Metabolism: Cause, Consequence and/or Enabler of Environmental Carcinogenesis?

R. Brooks Robey, Judith Weisz, Nancy Kuemmerle, Anna C. Salzberg, Arthur Berg, Dustin G. Brown, Laura Kubik, Roberta Palorini, Fahd Al-Mulla, Rabeah Al-Temaimi, Annamaria Colacci, Chiara Mondello, Jayadev Raju, Jordan Woodrick, A. Ivana Scovassi, Neetu Singh, Monica Vaccari, Rabindra Roy, Stefano Forte, Lorenzo Memeo, Hosni K. Salem, Amedeo Amedei, Roslida A. Hamid, Graeme P. Williams, Leroy Lowe, Joel Meyer, Francis L. Martin, William H. Bisson, Ferdinando Chiaradonna and Elizabeth P. Ryan

Environmental contributions to cancer development are widely accepted, but only a fraction of all pertinent exposures have probably been identified. Traditional toxicological approaches to the problem have largely focused on the effects of individual agents at singular endpoints. As such, they have incompletely addressed both the pro-carcinogenic contributions of environmentally relevant low-dose chemical mixtures and the fact that exposures can influence multiple cancer-associated endpoints over varying timescales. Of these endpoints, dysregulated metabolism is one of the most common and recognizable features of cancer, but its specific roles in exposure-associated cancer development remain poorly understood. Most studies have focused on discrete aspects of cancer metabolism and have incompletely considered both its dynamic integrated nature and the complex controlling influences of substrate availability, external trophic signals and environmental conditions. Emerging high throughput approaches to environmental risk assessment also do not directly address the metabolic causes or consequences of changes in gene expression. As such, there is a compelling need to establish common or complementary frameworks for further exploration that experimentally and conceptually consider the gestalt of cancer metabolism and its causal relationships to both carcinogenesis and the development of other cancer hallmarks. A literature review to identify environmentally relevant exposures unambiguously linked to both cancer development and dysregulated metabolism suggests major gaps in our understanding of exposure-associated carcinogenesis and metabolic reprogramming. Although limited evidence exists to support primary causal roles for metabolism in carcinogenesis, the universality of altered cancer metabolism underscores its fundamental biological importance, and multiple pleiomorphic, even dichotomous, roles for metabolism in promoting,

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antagonizing or otherwise enabling the development and selection of cancer are suggested.

Keywords: Dysregulated metabolism; Environmental carcinogenesis.

1074. Assessing the Carcinogenic Potential of Low-dose Exposures to Chemical Mixtures in the Environment: the Challenge Ahead

Hosni Khairy Salem Barghash

Carcinogenesis, 36: 254-296 (2015) IF: 5.334

Lifestyle factors are responsible for a considerable portion of cancer incidence worldwide, but credible estimates from the World Health Organization and the International Agency for Research on Cancer (IARC) suggest that the fraction of cancers attributable to toxic environmental exposures is between 7% and 19%. To explore the hypothesis that low-dose exposures to mixtures of chemicals in the environment may be combining to contribute to environmental carcinogenesis, we reviewed 11 hallmark phenotypes of cancer, multiple priority target sites for disruption in each area and prototypical chemicaldisruptors for all targets, this included dose-response characterizations, evidence of low-dose effects and cross-hallmark effects for all targets and chemicals. In total, 85 examples of chemicals were reviewed for actions on key pathways/ mechanisms related to carcinogenesis. Only 15% (13/85) were found to have evidence of a dose-response threshold, whereas 59% (50/85) exerted low-dose effects. No dose-response information was found for the remaining 26% (22/85). Our analysis suggests that the cumulative effects of individual (non-carcinogenic) chemicals acting on different pathways, and a variety of related systems, organs, tissues and cells could plausibly conspire to produce carcinogenic synergies. Additional basic research on carcinogenesis and research focused on low-dose effects of chemical mixtures needs to be rigorously pursued before the merits of this hypothesis can be further advanced. However, the structure of the World Health Organization International Programme on Chemical Safety 'Mode of Action' framework should be revisited as it has inherent weaknesses that are not fully aligned with our current understanding of cancer biology.

Keywords: Carcinogenic potential; Low-dose exposures; Chemical mixtures.

1075. Environmental Immune Disruptors, Inflammation and Cancer Risk

Patricia A.Thompson, Mahin Khatami, Carolyn J.Baglole, Jun Sun, Shelley Harris, Eun-Yi Moon, Fahd Al-Mulla, Rabeah Al-Temaimi, Dustin Brown, Annamaria Colacci, Chiara Mondello, Jayadev Raju, Elizabeth Ryan, Jordan Woodrick, Ivana Scovassi, Neetu Singh, Monica Vaccari, Rabindra Roy, Stefano Forte, Lorenzo Memeo, Hosni K.Salem, Amedeo Amedei, Roslida A.Hamid, Leroy Lowe Tiziana Guarnieri and William H.Bisson

Carcinogenesis, 36: 232-253 (2015) IF: 5.334

An emerging area in environmental toxicology is the role that chemicals and chemical mixtures have on the cells of the human immune system. This is an important area of research that has been most widely pursued in relation to autoimmune diseases and allergy/asthma as opposed to cancer causation. This is despite the well-recognized role that innate and adaptive immunity play as essential factors in tumorigenesis. Here, we review the role that the innate immune cells of inflammatory responses play in tumorigenesis. Focus is placed on the molecules and pathways that have been mechanistically linked with tumor-associated inflammation. Within the context of chemically induced disturbances in immune function as co-factors in carcinogenesis, the evidence linking environmental toxicant exposures with perturbation in the balance between pro- and anti-inflammatory responses is reviewed. Reported effects of bisphenol A, atrazine, phthalates and other common toxicants on molecular and cellular targets involved in tumor-associated inflammation (e.g. cyclooxygenase/prostaglandin E2, nuclear factor kappa B, nitric oxide synthesis, cytokines and chemokines) are presented as example chemically mediated target molecule perturbations relevant to cancer. Commentary on areas of additional research including the need for innovation and integration of systems biology approaches to the study of environmental exposures and cancer causation are presented.

Keywords: Environmental; Immune disruptors; Inflammation; Cancer risk.

1076. Disruptive Environmental Chemicals and Cellular Mechanisms that Confer Resistance to Cell Death

Kannan Badri Narayanan, Manaf Ali, Barry J.Barclay, Qiang Cheng, Leandro D'Abronzo, Rita Dornetshuber-Fleiss, Paramita M.Ghosh, Michael J.Gonzalez Guzman, Tae-Jin Lee, Po Sing Leung8, Lin Li, Suidjit Luanpitpong, Edward Ratovitski, Yon Rojanasakul, Maria Fiammetta Romano, Simona Romano, Ranjeet Kumar Sinha, Clement Yedjou, Fahd Al-Mulla, Rabeah Al-Temaimi, Amedeo Amedei, Dustin G.Brown, Elizabeth P.Ryan, Annamaria Colacci, Roslida A.Hamid, Chiara Mondello, Jayadev Raju, Hosni K.Salem, Jordan Woodrick, Ivana Scovassi, Neetu Singh, Monica Vaccari, Rabindra Roy, Stefano Forte, Lorenzo Memeo, Seo Yun Kim, William H.Bisson, Leroy Lowe and Hyun Ho Park

Carcinogenesis, 36: 89-110 (2015) IF: 5.334

Cell death is a process of dying within biological cells that are ceasing to function. This process is essential in regulating organism development, tissue homeostasis, and to eliminate cells in the body that are irreparably damaged. In general, dysfunction in normal cellular death is tightly linked to cancer progression. Specifically, the up-regulation of prosurvival factors, including oncogenic factors and antiapoptotic signaling pathways, and the down-regulation of proapoptotic factors, including tumor suppressive factors, confers resistance to cell death in tumor cells, which supports the emergence of a fully immortalized cellular phenotype. This review considers the potential relevance of ubiquitous environmental chemical exposures that have been shown to disrupt key pathways and mechanisms associated with this sort of dysfunction. Specifically, bisphenol A, chlorothalonil, dibutyl phthalate, dichlorvos, lindane, linuron, methoxychlor and oxyfluorfen are discussed as prototypical chemical disruptors; as their effects relate to resistance to cell death, as constituents within environmental mixtures and as potential contributors to environmental carcinogenesis.

Keywords: Environmental chemicals; Cellular mechanisms; Resistance to cell death.

1077. Chemical Compounds from Anthropogenic Environment and Immune Evasion Mechanisms: Potential Interactions

Julia Kravchenko, Emanuela Corsini, Marc A.Williams, William Decker, Masoud H.Manjili, Takemi Otsuki, Neetu Singh, Faha Al-Mulla, Rabeah Al-Temaimi, Amedeo Amedei, Anna Maria Colacci, Monica Vaccari, Chiara Mondello, A. Ivana Scovassi, Jayadev Raju, Roslida A.Hamid, Lorenzo Memeo, Stefano Forte, Rabindra Roy, Jordan Woodrick, Hosni K.Salem, Elizabeth P. Ryan, Dustin G. Brown, William H.Bisson, Leroy Lowe and H.Kim Lyerly

An increasing number of studies suggest an important role of host immunity as a barrier to tumor formation and progression. Complex mechanisms and multiple pathways are involved in evading innate and adaptive immune responses, with a broad spectrum of chemicals displaying the potential to adversely influence immunosurveillance. The evaluation of the cumulative effects of low-dose exposures from the occupational and natural environment, especially if multiple chemicals target the same gene(s) or pathway(s), is a challenge. We reviewed common environmental chemicals and discussed their potential effects on immunosurveillance. Our overarching objective was to review related signaling pathways influencing immune surveillance such as the pathways involving PI3K/Akt, chemokines, TGF-β, FAK, IGF-1, HIF-1α, IL-6, IL-1α, CTLA-4 and PD-1/PDL-1 could individually or collectively impact immunosurveillance. A number of chemicals that are common in the anthropogenic environment such as fungicides (maneb, fluoxastrobin and pyroclostrobin), herbicides (atrazine), insecticides (pyridaben and azamethiphos), the components of personal care products (triclosan and bisphenol A) and diethylhexylphthalate with pathways critical to tumor immunosurveillance. At this time, these chemicals are not recognized as human carcinogens; however, it is known that they these chemicalscan simultaneously persist in the environment and appear to have some potential interfere with the host immune response, therefore potentially contributing to promotion interacting with of immune evasion mechanisms, and promoting subsequent tumor growth and progression.
Keywords: Immune evasion; Chemical compounds; Enviroment.

1078. Assessing the Carcinogenic Potential of Lowdose Exposures to Chemical Mixtures in the Environment: Focus on the Cancer Hallmark of Tumor Angiogenesis

Zhiwei Hu, Samira A.Brooks, Valérian Dormoy, Chia-Wen Hsu, Hsue-Yin Hsu, Liang-Tzung Lin, Thierry Massfelder, W. Kimryn Rathmell, Menghang Xia, Fahd Al-Mulla, Rabeah Al-Temaimi, Amedeo Amedei, Dustin G. Brown, Kalan R.Prudhomme, Annamaria Colacci, Roslida A.Hamid, Chiara Mondello, Jayadev Raju, Elizabeth P. Ryan, Jordan Woodrick, A. Ivana Scovassi, Neetu Singh, Monica Vaccari, Rabindra Roy, Stefano Forte, Lorenzo Memeo, Hosni K.Salem, Leroy Lowe, Lasse Jensen, William H.Bisson and Nicole Kleinstreuer

One of the important 'hallmarks' of cancer is angiogenesis, which is the process of formation of new blood vessels that are necessary for tumor expansion, invasion and metastasis. Under normal physiological conditions, angiogenesis is well balanced and controlled by endogenous proangiogenic factors and antiangiogenic factors. However, factors produced by cancer cells, cancer stem cells and other cell types in the tumor stroma can disrupt the balance so that the tumor microenvironment favors tumor angiogenesis. These factors include vascular endothelial growth factor, endothelial tissue factor and other membrane bound receptors that mediate multiple intracellular signaling pathways that contribute to tumor angiogenesis. Though environmental exposures to certain chemicals have been found to initiate and promote tumor development, the role of these exposures (particularly to low doses of multiple substances), is largely unknown in relation to tumor angiogenesis. This review summarizes the evidence of the role of environmental chemical bioactivity and exposure in tumor angiogenesis and carcinogenesis. We identify a number of ubiquitous (prototypical) chemicals with disruptive potential that may warrant further investigation given their selectivity for high-throughput screening assay targets associated with proangiogenic pathways. We also consider the cross-hallmark relationships of a number of important angiogenic pathway targets with other cancer hallmarks and we make recommendations for future research. Understanding of the role of low-dose exposure of chemicals with disruptive potential could help us refine our approach to cancer risk assessment, and may ultimately aid in preventing cancer by reducing or eliminating exposures to synergistic mixtures of chemicals with carcinogenic potential.
Keywords: He cancer hallmark; Tumor angiogenesis.

1079. The Potential for Chemical Mixtures from the Environment to Enable the Cancer Hallmark of Sustained Proliferative Signalling

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The aim of this work is to review current knowledge relating the established cancer hallmark, sustained cell proliferation to the existence of chemicals present as low dose mixtures in the environment. Normal cell proliferation is under tight control, i.e. cells respond to a signal to proliferate, and although most cells continue to proliferate into adult life, the multiplication ceases once the stimulatory signal disappears or if the cells are exposed to growth inhibitory signals. Under such circumstances, normal cells remain quiescent until they are stimulated to resume further proliferation. In contrast, tumour cells are unable to halt proliferation, either when subjected to growth inhibitory signals or in the absence of growth stimulatory signals. Environmental chemicals with carcinogenic potential may cause sustained cell proliferation by interfering with some cell proliferation control mechanisms committing cells to an indefinite proliferative span.
Keywords: Chemical mixtures; Sustained proliferative signalling.

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1080. Causes of Genome Instability: the Effect of Low Dose Chemical Exposures in Modern Society

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Genome instability is a prerequisite for the development of cancer. It occurs when genome maintenance systems fail to safeguard the genome's integrity, whether as a consequence of inherited defects or induced via exposure to environmental agents (chemicals, biological agents and radiation). Thus, genome instability can be defined as an enhanced tendency for the genome to acquire mutations; ranging from changes to the nucleotide sequence to chromosomal gain, rearrangements or loss. This review raises the hypothesis that in addition to known human carcinogens, exposure to low dose of other chemicals present in our modern society could contribute to carcinogenesis by indirectly affecting genome stability. The selected chemicals with their mechanisms of action proposed to indirectly contribute to genome instability are: heavy metals (DNA repair, epigenetic modification, DNA damage signaling, telomere length), acrylamide (DNA repair, chromosome segregation), bisphenol A (epigenetic modification, DNA damage signaling, mitochondrial function, chromosome segregation), benomyl (chromosome segregation), quinones (epigenetic modification) and nano-sized particles (epigenetic pathways, mitochondrial function, chromosome segregation, telomere length). The purpose of this review is to describe the crucial aspects of genome instability, to outline the ways in which environmental chemicals can affect this cancer hallmark and to identify candidate chemicals for further study. The overall aim is to make scientists aware of the increasing need to unravel the underlying mechanisms via which chemicals at low doses can induce genome instability and thus promote carcinogenesis.
Keywords: Genome instability; Low dose; Chemical exposures.

1081. Disruptive Chemicals, Senescence and Immortality

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Carcinogenesis is thought to be a multistep process, with clonal evolution playing a central role in the process. Clonal evolution involves the repeated 'selection and succession' of rare variant cells that acquire a growth advantage over the remaining cell population through the acquisition of 'driver mutations' enabling a selective advantage in a particular micro-environment. Clonal selection is the driving force behind tumorigenesis and possesses three basic requirements: (i) effective competitive proliferation of the variant clone when compared with its neighboring cells, (ii) acquisition of an indefinite capacity for self-renewal, and (iii) establishment of sufficiently high levels of genetic and epigenetic variability to permit the emergence of rare variants. However, several questions regarding the process of clonal evolution remain. Which cellular processes initiate carcinogenesis in the first place? To what extent are environmental carcinogens responsible for the initiation of clonal evolution? What are the roles of genotoxic and non-genotoxic carcinogens in carcinogenesis?What are the underlying mechanisms responsible for chemical carcinogen-induced cellular immortality? Here, we explore the possible mechanisms of cellular immortalization, the contribution of immortalization to tumorigenesis and the mechanisms by which chemical carcinogens may contribute to these processes.
Keywords: Disruptive chemicals; Senescence; Immortality.

1082. The Effect of Environmental Chemicals on the Tumor Microenvironment

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Potentially carcinogenic compounds may cause cancer through direct DNA damage or through indirect cellular or physiological effects. To study possible carcinogens, the fields of endocrinology, genetics, epigenetics, medicine, environmental health, toxicology, pharmacology and oncology must be considered. Disruptive chemicals may also contribute to multiple stages of tumor development through effects on the tumor microenvironment. In turn, the tumor microenvironment consists of a complex interaction among blood vessels that feed the tumor, the extracellular matrix that provides structural and biochemical support, signaling molecules that send messages and soluble factors such as cytokines.
The tumor microenvironment also consists of many host cellular effectors including multipotent stromal cells/mesenchymal stem cells, fibroblasts, endothelial cell precursors, antigen-presenting cells, lymphocytes and innate immune cells. Carcinogens can influence the tumor microenvironment through effects on epithelial cells, the most common origin of cancer, as well as on stromal cells, extracellular matrix components and immune cells. Here, we review how environmental exposures can perturb the tumor microenvironment.

We suggest a role for disrupting chemicals such as nickel chloride, Bisphenol A, butyltins, methylmercury and paraquat as well as more traditional carcinogens, such as radiation, and pharmaceuticals, such as diabetes medications, in the disruption of the tumor microenvironment. Further studies interrogating the role of chemicals and their mixtures in dose-dependent effects on the tumor microenvironment could have important general mechanistic implications for the etiology and prevention of tumorigenesis.

Keywords: Environmental chemicals; Tumor microenvironment.

1083. Current use of Imaging after Primary Treatment of Prostate Cancer

Ahmed A. Hussein, Sanoj Punnen, Shoujun Zhao, Janet E. Cowan, Michael Leapman, Thanh C. Tran, Samuel L. Washington, Matthew D. Truesdale, Peter R. Carroll and Matthew R. Cooperberg

Purpose: Data are limited on imaging after primary treatment of localized prostate cancer.
Materials and Methods: We identified 8,435 men newly diagnosed with nonmetastatic prostate cancer in 1995 to 2012 who were enrolled in CaPSURE™. Patients were followed after primary treatment with radical prostatectomy, cryosurgery, brachytherapy, external beam radiation therapy or androgen deprivation therapy. We assessed the use of bone scan, computerized tomography and magnetic resonance imaging after primary treatment. Factors associated with posttreatment outcomes (number of imaging tests, and time to first imaging and salvage treatment) were evaluated with multivariate Poisson regression and Cox proportional hazards regression.
Results: The incidence of posttreatment bone scan, computerized tomography and magnetic resonance imaging was 20% or less. Last posttreatment log(prostate specific antigen) was associated with multiple posttreatment imaging.
Management by radical prostatectomy, cryosurgery, external beam radiation therapy or brachytherapy vs androgen deprivation therapy was associated with a lower likelihood of posttreatment imaging. Of patients who were imaged after treatment 25% with radical prostatectomy and 9% with radiation underwent imaging before prostate specific antigen failure. The 5-year salvage treatment-free survival rate was 81%. Positive findings on posttreatment imaging were associated with a higher risk of salvage treatment.
Conclusions: Patients treated with androgen deprivation therapy for localized disease were most likely to be imaged, primarily by bone scan. Men treated with other therapies were less likely to be imaged and tended to undergo computerized tomography. Imaging may add value to posttreatment prostate specific antigen monitoring to identify disease recurrence and progression. Further studies are needed to establish guidelines for the optimal frequency and imaging type to monitor the treatment response.
Keywords: Diagnostic imaging; Disease progression; Prostate-specific antigen; Prostatic neoplasms; Salvage therapy.

1084. Untreated Gleason Grade Progression on Serial Biopsies During Prostate Cancer Active Surveillance: Clinical Course and Pathological Outcomes

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Purpose: We describe the outcomes of patients with low risk localized prostate cancer who were upgraded on a surveillance biopsy while on active surveillance and evaluated whether delayed treatment was associated with adverse outcome.
Materials and Methods: We included men in the study with lower risk disease managed initially with active surveillance and upgraded to Gleason score 3+4 or greater. Patient demographics and disease characteristics were compared. Kaplan-Meier curve was used to estimate the treatment-free probability stratified by initial upgrade (3+4 vs 4+3 or greater), Cox regression analysis was used to examine factors associated with treatment and multivariate logistic regression analysis was used to evaluate the factors associated with adverse outcome at surgery.
Results: The final cohort comprised 219 men, with 150 (68%) upgraded to 3+4 and 69 (32%) to 4+3 or greater. Median time to upgrade was 23 months (IQR 11-49). A total of 163 men (74%) sought treatment, the majority (69%) with radical prostatectomy. The treatment-free survival rate at 5 years was 22% for 3+4 and 10% for 4+3 or greater upgrade. Upgrade to 4+3 or greater, higher prostate specific antigen density at diagnosis and shorter time to initial upgrade were associated with treatment. At surgical pathology 34% of cancers were downgraded while 6% were upgraded. Cancer volume at initial upgrade was associated with adverse pathological outcome at surgery (OR 3.33, 95% CI 1.19-9.29, p=0.02).
Conclusions: After Gleason score upgrade most patients elected treatment with radical prostatectomy. Among men who deferred definitive intervention, few experienced additional upgrading. At radical prostatectomy only 6% of cases were upgraded further and only tumor volume at initial upgrade was significantly associated with adverse pathological outcome.
Keywords: Disease progression; Neoplasm grading; Prostatic neoplasms; Watchful waiting.

1085. Ureteric Stents Vs Percutaneous Nephrostomy for Initial Urinary Drainage in Children with Obstructive Anuria and Acute Renal Failure Due to Ureteric Calculi: A Prospective, Randomised Study

Mohammed S. ElSheemy, Ahmed M. Shouman, Ahmed I. Shoukry, Ahmed ElShenoufy, Waseem Aboulela, Kareem Daw, Ahmed A. Hussein, Hany A. Morsi and Hesham Badawy

Objectives To compare percutaneous nephrostomy (PCN) tube vs JJ ureteric stenting as the initial urinary drainage method in children with obstructive calcular anuria (OCA) and post-renal acute renal failure (ARF) due to bilateral ureteric calculi, to identify the selection criteria for the initial urinary drainage method that will improve urinary drainage, decrease complications and facilitate the subsequent definitive clearance of stones, as this comparison is lacking in the literature.

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Patients and Methods A series of 90 children aged =12 years presenting with OCA and ARF due to bilateral ureteric calculi were included from March 2011 to September 2013 at Cairo University Pediatric Hospital in this randomised comparative study. Patients with grade 0–1 hydronephrosis, fever or pyonephrosis were excluded. No patient had any contraindication for either method of drainage. Stable patients (or patients stabilised by dialysis) were randomised (non-blinded, block randomisation, sealed envelope method) into PCN-tube or bilateral JJ-stent groups (45 patients for each group). Initial urinary drainage was performed under general anaesthesia and fluoroscopic guidance. We used 4.8–6 F JJ stents or 6–8 F PCN tubes. The primary outcomes were the safety and efficacy of both groups for the recovery of renal functions. Both groups were compared for operative and imaging times, complications, and the period required for a return to normal serum creatinine levels. The secondary outcomes included the number of subsequent interventions needed for clearance of stones. Additional analysis was done for factors affecting outcome within each group.

Results All presented patients completed the study with intention-to-treat analysis. There was no significant difference between the PCN-tube and JJ-stent groups for the operative and imaging times, period for return to a normal creatinine level and failure of insertion. There were significantly more complications in the PCN-tube group. The stone size (>2cm) was the only factor affecting the rates of mucosal complications, operative time and failure of insertion in the JJ-stent group. The degree of hydronephrosis significantly affected the operative time for PCN-tube insertion. Grade 2 hydronephrosis was associated with all cases of insertion failure in the PCN-tube group. The total number of subsequent interventions needed to clear stones was significantly higher in the PCN-tube group, especially in patients with bilateral stones destined for chemolytic dissolution (alkalinisation) or extracorporeal shockwave lithotripsy (ESWL).

Conclusion We recommend the use of JJ stents for initial urinary drainage for stones that will be subsequently treated with chemolytic dissolution or ESWL, as this will lower the total number of subsequent interventions needed to clear the stones. This is also true for stones destined for ureteroscopy (URS), as JJ-stent insertion will facilitate subsequent URS due to previous ureteric stenting. Mild hydronephrosis will prolong the operative time for PCN-tube insertion and may increase the incidence of insertion failure. We recommend the use of PCN tube if the stone size is >2cm, as there was a greater risk of possible iatrogenic ureteric injury during stenting with these larger ureteric stones in addition to prolongation of operative time with an increased incidence of failure.

Keywords: Anuria; Children; Nephrostomy; JJ stents; Urinary calculi.

1086. Rebuttal to Drs. Markovina and Michalski

Ahmed A. Hussein and Matthew R. Cooperberg

Brachytherapy, 14: 761-762 (2015) IF: 2.758

The paramount tenet of evidence-based medicine is that clinical decisions be based on the best available evidence. Although this may seem an obvious statement, for a complex clinical scenario like newly diagnosed prostate cancer, assessing quality of evidence is far from straightforward, and the devil lies very much in the details.

Keywords: Cost effectiveness; Localized; Prostate cancer; Treatment; Surgery.

1087. Point: Surgery Is the Most Cost-Effective Option for Prostate Cancer Needing Treatment

Ahmed A. Hussein and Matthew R. Cooperberg

Brachytherapy, 14: 753-755 (2015) IF: 2.758

For most men with localized prostate cancer (PCa), options include active surveillance, radical prostatectomy (RP), and radiation therapy (RT) in the form of brachytherapy (BT) and/or one of a variety of external beam radiation therapy (EBRT) techniques. Treatment should be tailored to each patient, considering the patient's overall health, life expectancy, and the disease risk (prostate specific antigen [PSA], tumor extent, and grade). Clinicians' skill and experience, and the patients' preference to trade-off potential benefits, side effects, and complications are other crucial factors guiding the treatment decision. Men must face treatment decisions in the face of a relative dearth of high-quality evidence comparing these options. Indeed, the effectiveness of the management strategies for localized PCa was considered among the highest initial national priorities for comparative effectiveness research by the Institute of Medicine in 2009. Although randomized controlled trials (RCTs) are still sorely lacking, however, in recent years, increasingly high-quality retrospective evidence regarding oncologic efficacy, side effects, and health-related quality of life (HRQOL), and cost has become available to inform these decisions.

Keywords: Cost effectiveness; Localized; Prostate cancer; Treatment; Surgery.

1088. Combination of Vitamin E and Clomiphene Citrate in Treating Patients with Idiopathic Oligoasthenozoospermia, is it Worth? A Prospective Randomized Trial

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Andrology, 3: 864-867 (2015) IF: 2.298

The most common cause of male infertility is idiopathic oligoasthenozoospermia. Empirical medical treatment for idiopathic male infertility is still a controversial issue. The aim of this study was to evaluate any possible effects of combining vitamin E as antioxidant and clomiphene citrate as antiestrogen on spermatozoa concentration and motility in comparison to give either of medications alone in patients with idiopathic oligoasthenozoospermia. This is a comparative prospective randomized study. Ninety patients with idio- pathic oligoasthenozoospermia were randomized into equally three groups: Group A: received vitamin E (400 mg/day) for 6 months. Group B: received clomiphene citrate (25 mg daily) for 6 months. Group C: received combination of both drugs in the same doses for 6 months. All patients were subjected to the following: history taking, general and genital examination, semen analysis, serum FSH, total testosterone, and scrotal duplex. Semen examination was performed according to the guidelines of (WHO, 2010), at the start of treatment and was repeated after 3 months and after 6 months of treatment. Regarding vitamin E group, there was insignifi- cant increase in mean sperm concentration after 6 months of treatment in comparison to baseline. On the other hand, there was a significant improvement of mean sperm concentration in the other two groups after 6 months of treatment, with more

significance in combination therapy group (p = 0.001). The mean total sperm motility has improved in all patients groups, in comparison to base- line, with more significance in combination therapy group. In vitamin E group, it was 28.07 9.65% (p = 0.000). For those in clomi- phene citrate group, was 33.33 14.10% (p = 0.003) and 40.50 17.54% (p = 0.000) in combination therapy group. Combining antioxidant and anti-estrogen therapy is a valid option for the treatment of a selected group of men with unexplained isolated oligoasthenozoospermia.

Keywords: Semen analysis; Sperm count; Sperm motility; 5 sperm quality parameters; Subfertility; Treatment.

1089. Holmium Laser Enucleation of the Prostate Versus Bipolar Resection of the Prostate: A Prospective Randomized Study. "Pros and Cons"

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Urology, 86: 1037-1041 (2015) IF: 2.188

Objective To compare the safety, efficacy, and applicability of holmium laser enucleation of the prostate (HoLEP) and bipolar transurethral resection of the prostate (TURPb) procedures, whereas the secondary objective is to find out the advantages and disadvantages of each.

Patients and Methods A prospective randomized study included 120 patients with benign prostatic hyperplasia that required intervention. The patients were randomized in 2 equal groups: group A managed by HoLEP and group B managed by TURPb. The mean age, International Prostate Symptom Score, maximum urine flow, residual urine, operative time, blood loss, resected volume, catheterization time, hospital stay, and costs were compared.

Results Both groups were comparable regarding the preoperative parameters. The mean operative time was statistically significantly longer in the HoLEP group. The drop in the hemoglobin level was statistically significantly in group B. The mean resected prostatic volume was 61.167 g in the HoLEP group and 58.8 g in the TURPb group. The catheter was removed after 24 hours in 51 and 36 patients in groups A and B, respectively. The International Prostate Symptom Score at 1 and 12 months and the maximum urine flow at 12 months postoperatively were found to be better in the HoLEP group than in the bipolar group, and this difference was found to be statistically significant.

Conclusion Although the HoLEP technique is associated with a relatively longer operative time, it has proved to be effective in treating large prostates with minimal morbidity, better hemostasis, less blood loss, and better voiding pattern than TURPb after a 12-month follow-up.

1090. Understanding Cognitive Performance During Robot-assisted Surgery

Guru KA, Shafiei SB, Khan A, Hussein AA, Sharif M and Esfahani ET.

Urology, 86: 751-757 (2015) IF: 2.188

Objective To understand cognitive function of an expert surgeon in various surgical scenarios while performing robot-assisted surgery.

Materials and Methods: In an Internal Review Board approved study, National Aeronautics and Space Administration-Task Load Index (NASA-TLX) questionnaire with surgical field notes were simultaneously completed. A wireless electroencephalography (EEG) headset was used to monitor brain activity during all procedures. Three key portions were evaluated: lysis of adhesions, extended lymph node dissection, and urethro-vesical anastomosis (UVA). Cognitive metrics extracted were distraction, mental workload, and mental state.

Results: In evaluating lysis of adhesions, mental state (EEG) was associated with better performance (NASA-TLX). Utilizing more mental resources resulted in better performance as self-reported. Outcomes of lysis were highly dependent on cognitive function and decision-making skills. In evaluating extended lymph node dissection, there was a negative correlation between distraction level (EEG) and mental demand, physical demand and effort (NASA-TLX). Similar to lysis of adhesion, utilizing more mental resources resulted in better performance (NASA-TLX). Lastly, with UVA, workload (EEG) negatively correlated with mental and temporal demand and was associated with better performance (NASA-TLX). The EEG recorded workload as seen here was a combination of both cognitive performance (finding solution) and motor workload (execution). Majority of workload was contributed by motor workload of an expert surgeon. During UVA, muscle memory and motor skills of expert are keys to completing the UVA.

Conclusion: Cognitive analysis shows that expert surgeons utilized different mental resources based on their need.

Keywords: Cognition; Robot-assisted; Surgery; Operative; Robotic; Evaluation.

1091. Outcome of Mini-Percutaneous Nephrolithotomy for Renal Stones in Infants and Preschool Children: A Prospective Study

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Urology, 86: 1019-1026 (2015) IF: 2.188

Objective To assess the safety and efficacy of Miniperc for renal stones in preschool-age patients. To the best of our knowledge, this may be the first prospective study on this subject. Reports on Miniperc are still few and mostly retrospective using a sheath size of =18Fr, which is still relatively large for young children.

Patients and Methods From January 2012 to May 2013, Miniperc was performed for 26 children (=6 years old) with renal calculi <5cm through 14Fr sheath using a 9.5Fr semirigid ureteroscope with Holmium:yttrium-aluminum-garnet laser lithotripsy. Effects of different factors on operative time, complications, and stone-free rate (SFR) were compared using chi-square, Fischer exact, or Mann-Whitney tests as appropriate using SPSS v15.0.

Results Primary SFR, SFR after retreatment, and SFR after auxiliary extracorporeal shock wave lithotripsy (ESWL) were 77%, 85%, and 92%, respectively. Retreatment rate was 8%. Auxiliary ESWL was done in 11%. Complications were bleeding (8%), hematuria and blood transfusion (4%), renal pelvis perforation (4%), leakage (8%), and fever (15%). Operative time was significantly prolonged in multiple (>2) stones (P=.006), calyceal stones (P=.002), or stone size =30mm (P=.022). SFR was

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significantly lower in children with >2 stones (P=.028) and increased stone size =30mm (P=.014).

Conclusion Miniperc is a safe and effective minimally invasive procedure for pediatric renal stones using 14Fr access sheath. SFR was significantly lower in children with >2 stones or increased stone size=30mm. This was overcome by retreatment and auxiliary ESWL.

Keywords: Mini-percutaneous nephrolithotomy; Renal stones; Infants; Preschool children.

1092. Surgeon-Tailored Polypropylene Mesh as A Tension-free Vaginal Tape-obturator Versus Original TVT-O for the Treatment of Female Stress Urinary Incontinence: A Long-term Comparative Study

Mohammed S. ElSheemy, Hesham Fathy, Hussein A. Hussein, Ragheb Elsergany and Eman A. Hussein

Introduction and hypothesis The objective of the study was to compare the safety and efficacy of surgeon-tailored polypropylene mesh (STM) through tension-free vaginal tape-obturator (TVT-O) versus original TVT-O in the treatment of stress urinary incontinence (SUI) aiming to decrease the cost of treatment. This is important in developing countries due to limited health care resources.

Methods A retrospective cohort study was done at the Urology and Gynecology Departments (dual-center), Cairo University from May 2007 to June 2010. Women evaluated by cough stress test, Stress and Urge Incontinence and Quality of Life Questionnaire (SUIQQ), maximum flow rate (Qmax), and abdominal leak point pressure (ALPP) with follow-up for at least 48 months were included. Patients with post-void residual urine>100 ml, bladder capacity<300 ml, or impaired compliance were excluded.

The effect of different factors on outcome was compared between both groups pre- and postoperatively using the paired t, Wilcoxon signed rank, McNemar, chi-square, Fisher's exact, independent t, or Mann–Whitney tests.

Results STM and TVT-O were inserted in 79 and 66 women, respectively. Intrinsic sphincter deficiency, ALPP, previous surgeries, associated urgency, urgency urinary incontinence (UUI), and prolapse were comparable in both groups. Operative duration was longer in STM by 10 min. No significant difference was found between both groups in complications (p=0.462), cure (p=0.654), and different indices of SUIQQ. In STM, 74 (93 %) were cured and 3 (4 %) improved, while SUI persisted in 2 (2 %) patients. In TVT-O, 59 (89 %) were cured and 4 (6 %) improved, while failure was detected in 3 (4 %) patients.

Conclusions The 5-year outcome is comparable between STM and TVT-O. Furthermore, STM is more economical due to our resterilizable modified helical passers and the cheap polypropylene mesh.

Keywords: Female stress urinary incontinence; Surgeon-tailored mesh; Polypropylene mesh; TVT-O; TOT; Cost.

1093. Low-cost Transobturator Vaginal Tape Inside-Out Procedure for the Treatment of Female Stress Urinary Incontinence Using Ordinary Polypropylene Mesh

Mohammed S. ElSheemy, Ragheb Elsergany and Ahmed ElShenoufy

Introduction and hypothesis The aim of this study is to describe the use of ordinary polypropylene mesh and our modified helical passers through a transobturator vaginal tape inside-out technique (TVT-O) as a low-cost alternative to available commercial kits in the treatment of stress urinary incontinence (SUI) with evaluation of its long-term safety and efficacy. This is important in developing countries due to limited health care resources.

Methods Tailored (11×1.5 cm) polypropylene tape was inserted in 59 women from June 2006 to June 2009 at the Urology Department, Cairo University Hospitals as an open prospective study. SUI was diagnosed by positive cough stress test (CST) and abdominal leak point pressure (ALPP). Patients with post-void residual urine (PVRU) >100 ml, bladder capacity<300 ml, or neurological lesions were excluded. The Stress and Urge Incontinence and Quality of Life Questionnaire (SUIQQ), urodynamic parameters, and other variables were compared pre-versus postoperatively with paired t, Wilcoxon signed rank, McNemar, or chi-square tests.

Results The mean age was 47.47±8.52 years. Twenty-one (35.6 %) patients had intrinsic sphincter deficiency (ISD). The mean operative time was 21.22±4.26 min (15–30). Procedures for prolapse were done in four (6 %) patients. Complications were vaginal discharge (6 %), dyspareunia (1 %), groin pain (20 %), urinary tract infection (3 %), obstructive symptoms (1 %), accidental cut of polypropylene suture (1 %) and felt subcutaneous polypropylene sutures (3 %). We had no cases of erosions or de novo urgency. SUIQQ indices improved significantly, while urodynamic parameters showed no significant difference postoperatively. Of the patients, 54 (91 %) were cured and 3 (5 %) improved, while failure was detected in 2 (3 %) patients.

Conclusions Our technique is safe with excellent 5-year Results. It should be considered as a low-cost alternative to available commercial kits in the treatment of SUI mainly for public health systems with few financial resources.

Keywords: Female stress urinary incontinence; Polypropylene Mesh; TVT-O TOT; Helical passers; Cost.

1094. Transurethral Holmium Laser Cystolithotripsy in Children: Single Center Experience

Waseem Aboulela, Mohammed S. ElSheemy, Ahmed I Shoukry, Ahmed M. Shouman, Ahmed ElShenoufy, Kareem Daw, Hany A. Morsi and Hesham Badawy

Purpose: To evaluate prospectively safety and efficacy of transurethral cystolithotripsy (CL) in children using holmium:yttrium-aluminum-garnet (Ho:YAG) laser. This is important in developing countries, because the risk of bladder stones in children is high. Open cystolithotomy (OC) was the main line of treatment. A gradual shift has occurred toward

endourologic treatment after improvement of pediatric endoscopes.

Patients and Methods: Between January 2010 and May 2011, 33 children <12 years old with vesical calculi were treated. Children with orthopedic deformities, urethral stricture, history of urethral operations or bladder reconstruction, or stones >4cm were excluded. Cystoscopies were performed under general anesthesia using 9 to 11F cystoscopes. Stones were completely fragmented under video guidance. Ho:YAG was applied at a power of 30W.

Results: Median age was 3 years (0.5–11). Mean stone size was 2.02±0.82cm (1–4cm). Mean operative duration was 31.21 minutes (20–50). All children were discharged within 24 hours. A single operative session was performed for each patient. No complications were detected. After a mean follow-up of 16.87±4.08 months, all children were stone free, without development of any urethral stricture or recurrence of stones. Operative duration was significantly longer in stones >20mm (P<0.001).

Conclusion: Ho:YAG laser CL is a safe and successful minimally invasive treatment option for bladder stones in children. Success rate was 100% without development of any complications or recurrence.

Keywords: Transurethral; Holmium laser; Cystolithotripsy; Children; Bladder stones.

1095. Surgeon-Tailored Polypropylene Mesh as A Needleless Single-incision Sling Versus TVT-O for the Treatment of Female Stress Urinary Incontinence: A Comparative Study

Mohammed S. ElSheemy, Hesham Fathy, Hussein A. Hussein, Eman A. Hussein and Sarah Mohamed Hassan

Purpose To compare safety and efficacy of surgeon-tailored polypropylene mesh through needleless single-incision technique (STM) versus tension-free vaginal tape-obturator (TVT-O) aiming to decrease cost of treatment of stress urinary incontinence (SUI). This is important in developing countries due to limited healthcare resources.

Patients and Methods A retrospective cohort study was done at Urology and Gynecology Departments (dual-center), Cairo University, from January 2011 to August 2013. STM was inserted in 72 females, while TVT-O was inserted in 48 females. Females evaluated by cough stress test, stress and urge incontinence quality of life questionnaire (SUIQQ), Q max and abdominal leak point pressure (ALPP) were included. Different factors were compared between both groups using paired t, Wilcoxon's signed rank, McNemar, Chi-square, Fisher's exact, independent t or Mann–Whitney tests.

Results Age, parity, previous surgeries, ALPP, intrinsic sphincter deficiency (ISD), associated prolapse and associated prolapse repair were comparable in both groups. No significant difference was found between both groups in postoperative complications (except groin pain), cure, SUIQQ indices improvement and Q max decline. In total, 65 (90 %) cured, 6 (8 %) improved while failure was detected in one (1 %) patient in STM group, while 42 (87 %) cured, 4 (8 %) improved and failure was detected in two (4 %) patients in TVT-O group. Presence of ISD (p = 0.565), urgency (p = 0.496), UUI (p = 0.531), previous surgeries (p = 0.345), associated urogenital prolapse (p = 0.218) or associated

prolapse repair (p = 0.592) did not lead to any significant difference in outcome between both groups. Cost of mesh decreased from US$500 (TVT-O) to US$10 (STM).

Conclusion Outcome of STM is comparable to TVT-O. Furthermore, STM is more economic

Keywords: Female stress urinary incontinence; Surgeon-tailored mesh; Polypropylene; Contasure-needleless; Single incision; TVT-O.

1096. Use of Surgeon-Tailored Polypropylene Mesh as A Needle-Less Single-Incision Sling for Treating Female Stress Urinary Incontinence: Preliminary Results

Mohammed S. ElSheemy, Hisham Ghamrawy, Hesham Fathy, Hussein A. Hussein, Eman A. Hussein, Ahmed Aly and Sherif Abdel Rahman

Objective To evaluate the safety and efficacy of a procedure using surgeon-tailored polypropylene mesh (STM) through a needle-less single-incision technique for treating stress urinary incontinence (SUI), aiming to decrease the cost of treatment, which is important in developing countries.

Patients and Methods In all, 43 women diagnosed using a cough stress test were treated from January 2011 to June 2013 at the Urology and Gynaecology Departments (dual-centre), Cairo University Hospitals. Previous surgery was not a contra-indication. Patients with a postvoid residual urine volume of >100 mL, a bladder capacity of <300 mL, impaired compliance or neurological lesions were excluded. The Stress and Urge incontinence Quality of life Questionnaire (SUIQQ) and urodynamic variables were compared before and after surgery. The variables were compared between the baseline and postoperative follow-up values using a paired t-test, a Wilcoxon signed-rank test or McNemar's test.

Results The mean age was 42.7 years and 20 (47%) patients had associated urgency UI (UUI), whilst 21 (49%) had intrinsic sphincter deficiency. The median (range) operative duration was 14 (5–35) min. There were no complications during surgery. The mean (SD, range) follow-up was 28.1 (5.1, 18–36) months. Postoperative complications were vaginal discharge (5%), failure of wound healing (5%), dyspareunia (5%) and UTI (5%). The sling was removed in one case. SUI, UUI and quality-of-life indices improved significantly after surgery. There were no significant differences in pressure-flow studies before and after surgery. In all, 38 (88%) patients were cured, four (9%) improved and in one only the treatment failed (2%).

Conclusion This technique is simple, safe, effective, reproducible and economical for treating SUI. The STM was easy to insert in a short operation.

Keywords: Female; Stress urinary incontinence; Polypropylene mesh; Single incision.

Medicine Sector

1097. Predictive Factors of Bladder Outlet Obstruction Following the Tension-Free Vaginal Tape Obturator (TVTO) Procedure in Females Treated Surgically for Stress Urinary Incontinence

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African Journal of Urology, 21: 122-125 (2015)

Objectives: To identify patients at risk for postoperative outlet obstruction after the tension-free vaginal tape obturator (TVTO) procedure in order to allow for better counseling and possible treatment alternatives.

Subjects and Methods: This prospective study was carried out on 85 women who underwent the TVTO procedure for treatment of stress urinary incontinence (SUI). Preoperatively, a detailed medical history was taken from all patients, and all were subjected to physical examination, routine labs, abdominal and pelvic ultrasound and urodynamic studies (cystometry and assessment of the detrusor leak point pressure (DLPP), abdominal leak point pressure (ALPP), pressure flow and post-void residual (PVR) urine). The TVTO procedure was carried out by the same surgeon in all cases. Postoperative voiding dysfunction in this study was defined as the subjective feeling of difficult voiding, a weak stream and/or incomplete evacuation, and a PVR urine volume >100 ml, a urine flow rate <15 ml/s or urinary retention on examination. The following risk factors for postoperative bladder outlet obstruction were evaluated: age, history of previous incontinence surgery, parity, menopausal status, type of SUI, grade of SUI, residual urine, Qmax and PdetQmax. Statistical analysis was done using the SPSS package version 1.5.

Results: 75% of our patients were cured. Denovo urgency or urge incontinence developed in 5.8% of the patients. Voiding dysfunction according to our definition developed in 24.7% of the patients. On multivariate analysis, Qmax was the only risk factor that could predict postoperative bladder outlet obstruction (p = 0.002, odds ratio = 0.658, 95% C.I.).

Conclusion: Preoperative Qmax is the only independent risk factor for postoperative bladder outlet obstruction in women undergoing TVTO surgery.

Brief Summary: TVTO is an effective surgical option for genuine stress incontinence in females. Preoperative Qmax is the only independent risk factor for postoperative bladder outlet obstruction.

Keywords: Urethral hypermobility; SUI; Voiding dysfunction; Vaginal tapes.

Faculty of Oral Dental Medicine

Dept. of Dental Material

1098. Chemical and Biological Evaluation of Egyptian Nile Tilapia (Oreochromis Niloticas) Fish Scale Collagen

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International Journal of Biological Macromolecules, 79: 618-626 (2015) IF: 2.858

Collagen is considered to be one of the most useful biomaterials with different medical applications. However, collagen properties differ from one source to another. The aim of this study was to extract,purify, characterize and perform preliminary biological evaluation of type I collagen from scales of Egyp-tian Nile Tilapia. Pepsin-solubilized collagen (PSC) was successfully prepared from Nile Tilapia fish scalewaste. Lyophilized collagen was dissolved in dilute HCl to form acidic collagen solutions (ACS) which wasneutralized to form gel. To confirm the biocompatibility of the produced gel, baby hamster kidney (BHK-21) fibroblast cells were seeded onto a 3D collagen gel (0.3% and 0.5%, w/v). The results of an SDS-PAGEtest showed that the extracted collagens were type I collagen, with α chain composition of (1)22.Thermal analysis showed that the denaturation temperature was 32°C. X-ray diffraction (XRD) analy-sis and Fourier-transform infrared spectra (FTIR) showed that the extracted collagen had a triple helixstructure. Active proliferation of BHK-21 cells with no signs of toxicity was evident with both collagengel concentrations tested. The results show that Nile Tilapia scales can be an effective source of collagenextraction that could be used as a potential biomaterial in biomedical applications.

Keywords: Nile tilapia; Fish scale; Type I collagen; Characterization; BHK-21 (Baby hamster kidney).

Dept. of Oral and Maxillofacial Surgery

1099. Does Prolonged Reconstruction of Disarticulation Defect with Bone Plate Affect the Electromyography Records of Masticatory Muscles?

Emad Tawfik Daif

Journal of Craniofacial Surgery, 26: (2015) IF: 0.678

Objectives: For medical or socioeconomic reasons, the primary reconstruction of disarticulation defects with bone plates stays for many years. This study was performed to assess the effect of this delay on EMG records of masticatory muscles.

Materials and Methods: 25 patients treated by insertion of reconstruction plates in disarticulation defects were prospectively participated in this study. EMG records for masticatory muscles were obtained before surgery and three months, six months, one year, two years and three years afterwards. Paired t-test was used to determine whether there was significant difference between the EMG values or not.

Results: At three years after surgery, the amplitude values of masseter and temporalis muscles, on the resected side, have decreased by 39% and 60% respectively while; on the non-operated side they have increased by 35% and 29%. The peak decrease, on the resected sides, has occurred at three months for

temporalis and two years for masseter. On the non-operated side, the peak increase has occurred at six months for both temporalis and masseter.

Conclusions: A prolonged use of bone plates to reconstruct disarticulation defects leads to alterations in EMG values of masticatory muscles. These alterations present clinically as muscle atrophy on the operated side and hypertrophy on the non-operated side.

Keywords: Hemimandibulectomy; Masticatory muscles; Electromyography.

Dept. of Oral Medicine and Periodontology

1100. Stem Cell Transplantation for Pulpal Regeneration: A Systematic Review

Karim M. Fawzy El-Sayed, Kimberley Jakusz, Arne Jochens, Christof Dorfer and Falk Schwendicke

For treating pulpal pathological conditions, pulpal regeneration through transplanted stem/progenitor cells might be an alternative to conventional root canal treatment. A number of animal studies demonstrated beneficial effects of stem/progenitor cell transplantation for pulp-dentin complex regeneration, that is, pulpal tissue, neural, vascular, and dentinal regeneration. We systematically reviewed animal studies investigating stem/progenitor cell-mediated pulp-dentin complex regeneration. Studies quantitatively comparing pulp-dentin complex regeneration after transplantation of stem/progenitor cells versus no stem/progenitor cell transplantation controls in intraoral in vivo teeth animal models were analyzed.

The following outcomes were investigated: regenerated pulp area per root canal total area, capillaries per total surface, regenerated dentinal area per total defect area, and nerves per total surface. PubMed and EMBASE were screened for studies published until July 2014. Cross-referencing and hand searching were used to identify further articles. Standardized mean differences (SMD) and 95% confidence intervals (95% CI) were calculated using random-effects meta-analysis.

To assess possible bias, SYRCLE's risk of bias tool for animal studies was used. From 1364 screened articles, five studies (representing 64 animals) were included in the quantitative analysis. Risk of bias of all studies was high. Stem/progenitor cell-transplanted pulps showed significantly larger regenerated pulp area per root canal total area (SMD [95% CI]: 2.28 [0.35-4.21]) and regenerated dentin area per root canal total area (SMD: 6.91 [5.39-8.43]) compared with no stem/progenitor cell transplantation controls.

Only one study reported on capillaries per or nerves per total surface and found both significantly increased in stem/progenitor cell-transplanted pulps compared with controls. Stem/progenitor cell transplantation seems to enhance pulp-dentin complex regeneration in animal models. Due to limited data quantity and quality, current evidence levels are insufficient for further conclusions.

Keywords: Stem cell; Transplantation; Pulp; Regeneration.

1101. Periodontal Regeneration Employing Gingival Margin-Derived Stem/ Progenitor Cells in Conjunction with Il-1Ra-Hydrogel Synthetic Extracellular Matrix

Fawzy El-Sayed KM, Mekhemar MK, Beck-Broichsitter BE, B€ahr T, Hegab M, Receveur J, Heneweer C, Becker ST, Wiltfang J and D€orfer CE. Periodontal

Aim: This study investigated the periodontal regenerative potential of gingival margin-derived stem/progenitor cells (G-MSCs) in conjunction with IL-1ra-releasing hyaluronic acid synthetic extracellular matrix (HA-sECM).

Materials and Methods: Periodontal defects were induced at four sites in eight miniature pigs in the premolar/molar area (-4 weeks). Autologous G-MSCs were isolated from the free gingival margin and magnetically sorted, using anti-STRO-1 antibodies. Colony formation and multilineage differentiation potential were tested. The G-MSCs were expanded and incorporated into IL-1ra-loaded/unloaded HA-sECM. Within every miniature pig, four periodontal defects were randomly treated with IL-1ra/G-MSCs/HA-sECM (test group), G-MSCs/HA-sECM (positive-control), scaling and root planing (SRP; negative control-1) or left untreated (no-treatment group; negative control 2). Differences in clinical attachment level (ΔCAL), probing depth (ΔPD), gingival recession (ΔGR), radiographic defect volume (ΔRDV), and changes in bleeding on probing (BOP) between baseline and 16 weeks post-transplantation, as well as periodontal attachment level (PAL), junctional epithelium length (JE), connective tissue adhesion (CTA), cementum regeneration (CR) and bone regeneration (BR) at 16 weeks post-transplantation were evaluated.

Results: Isolated G-MSCs showed stem/progenitor cell characteristics. IL-1ra loaded and unloaded G-MSCs/HA-sECM showed higher CAL, PD, GR, PAL, CR and BR as well as a lower JE compared to their negative controls and improved BOP.

Conclusion: G-MSCs in conjunction with IL-1ra-loaded/unloaded HA-sECM show a significant periodontal regenerative potential.

Keywords: Il-1Ra; Gingiva; Hydrogel; Periodontitis; Regeneration; Stem cells.

1102. Analysis of the Dimensions of the Labial Bone Wall in the Anterior Maxilla: A Cone-Beam Computed Tomography Study

Hani El Nahass and Suzy N. Naiem

Immediate implant placement in extraction socket does not appear to prevent the resorption of the labial wall. It has been recommended that a minimal thickness of 1–2 mm of buccal bone should be available to preclude the resorption of the facial vertical dimension of the socket wall.

Objective The aim was to determine the dimension of the facial buccal plate of bone in the anterior esthetic zone at different levels and relate it to immediate implant placement.

Materials and methods Seventy-three patients' cone-beam tomographic scans were included in the study (42 female and 31 male, mean age 39.6 years). The images were acquired using OnDemand software. The measurements taken included: Distance between the CEJ and the alveolar crest. The labial bone

thickness at different levels in relation to alveolar crest: at 1, 2, and 4 mm.

The results The measurements demonstrated that the distance between the CEJ and the crest was 2.10 ± 0.85 for the central and 2.09 ± 0.72 for the lateral incisor. The measurement taken at M0 (crestal level) revealed that only 1% of the incisors showed a thick labial bone (1–2 mm) and 73% showed a thin bony wall (0.5–1 mm) and 25% showed very thin wall <0.5 mm. At the M1, 7% showed very thin bony wall and 86% showed a thin bony wall while only 6% exhibited a thick bony wall. The M2 showed only 1% of very thin bony wall, and about 85% showed a thin bony wall and 14% exhibited a thick bony level. The M4 demonstrated very thin bony wall and about 75% thin bony wall and 23% showed thick bony wall. Males showed statistically significantly higher mean distance between cemento–enamel junction and alveolar crest (CEJ-AC) than females at the central as well as lateral incisors. To obtain good results, meticulous preoperative analysis is recommended. Thus, to chose an adequate treatment approach, the utilization of CBCT is recommended.

Keywords: Implant; Cone beam; Immediate implant; Buccal bone thickness; Labial plate.

1103. Pluripotency Gene Expression and Growth Control in Cultures of Peripheral Blood Monocytes During Their Conversion Into Programmable Cells of Monocytic Origin (PCMO): Evidence for A Regulatory Role of Autocrine Activin and TGF-β

Hendrik Ungefroren, Ayman Hyder, Hebke Hinz, Stephanie Groth, Hans Lange, Karim M. Fawzy El-Sayed, Sabrina Ehnert, Andreas K. Nüssler, Fred Fändrich and Frank Gieseler

Previous studies have shown that peripheral blood monocytes can be converted in vitro to a stem cell-like cell termed PCMO as evidenced by the re-expression of pluripotency-associated genes, transient proliferation, and the ability to adopt the phenotype of hepatocytes and insulin-producing cells upon tissue-specific differentiation. However, the regulatory interactions between cultured cells governing pluripotency and mitotic activity have remained elusive. Here we asked whether activin(s) and TGF-β (s), are involved in PCMO generation. De novo proliferation of PCMO was higher under adherent vs. suspended culture conditions as revealed by the appearance of a subset of Ki67-positive monocytes and correlated with down-regulation of p21^{WAF1} beyond day 2 of culture. Realtime-PCR analysis showed that PCMO express ActRIIA, ALK4, TβRII, ALK5 as well as TGF-β1 and the β$_A$ subunit of activin. Interestingly, expression of ActRIIA and ALK4, and activin A levels in the culture supernatants increased until day 4 of culture, while levels of total and active TGF-β1 strongly declined. PCMO responded to both growth factors in an autocrine fashion with intracellular signaling as evidenced by a rise in the levels of phospho-Smad2 and a drop in those of phospho-Smad3. Stimulation of PCMO with recombinant activins (A, B, AB) and TGF-β1 induced phosphorylation of Smad2 but not Smad3. Inhibition of autocrine activin signaling by either SB431542 or follistatin reduced both Smad2 activation and Oct4A/Nanog upregulation. Inhibition of autocrine TGF-β signaling by either SB431542 or anti-TGF-β antibody reduced Smad3 activation and strongly increased the number of Ki67-positive cells. Furthermore, anti-TGF-β antibody moderately enhanced Oct4A/Nanog expression. Our data show

that during PCMO generation pluripotency marker expression is controlled positively by activin/Smad2 and negatively by TGF-β/Smad3 signaling, while relief from growth inhibition is primarily the result of reduced TGFβ/Smad3, and to a lesser extent, activin / Smad2 signaling.

Keywords: Pluripotency; Gene; Expression.

1104. Expression of Leptin and Visfatin in Gingival Tissues of Chronic Periodontitis With and Without Type 2 Diabetes Mellitus: A Study Using Enzyme-Linked Immunosorbent Assay and Real-Time Polymerase Chain Reaction

Noha A. Ghallab, Eman M. Amr, and Olfat G. Shaker

The aim of this study is to investigate the protein and gene expression of leptin and visfatin in gingival tissue from patients with chronic periodontitis (CP), patients with CP and type 2 diabetes mellitus (T2DM), and healthy individuals.

Methods: The study includes 50 individuals: 10 healthy individuals, 20 patients with CP, and 20 patients with CP and T2DM. Plaque index, gingival index, probing depth, and clinical attachment loss were measured, and gingival biopsies were obtained. Leptin and visfatin protein expression in gingival tissues was determined using enzyme-linked immunosorbent assay, and messenger RNA (mRNA) expression was measured via real-time polymerase chain reaction.

Results: The highest leptin mRNA and protein expression was observed in the control group and was significantly ($P \leq 0.05$) different from the CP and CP+T2DM groups. Gingival tissues from patients with CP and T2DM had a significant increase in visfatin and a decrease in leptin gene and protein expression ($P < 0.05$) compared with both controls and patients with CP.

Conclusion: Expression of leptin and visfatin in the gingival tissues suggests a possible role for these adipokines in the pathogenesis of CP and T2DM.

Keywords: Adipokines; Diabetes mellitus; Enzyme-linked Immunosorbent assay; Molecular biology; Periodontitis; Polymerase chain reaction.

1105. Isolation and Characterisation of Human Gingival Margin-Derived STRO-1/ MACS$^+$ and MACS$^-$ Cell Populations

Karim M Fawzy El-Sayed, Sebastian Paris, Christian Graetz, Neemat Kassem, Mohamed Mekhemar, Hendrick Ungefroren, Fred Fa¨ndrich and Christof Do¨rfer

Recently, gingival margin-derived stem/progenitor cells isolated via STRO-1/magnetic activated cell sorting (MACS) showed remarkable periodontal regenerative potential in vivo. As a second-stage investigation, the present study's aim was to performin vitro characterisation and comparison of the stem/progenitor cell characteristics of sorted STRO-1-positive (MACS$^+$) and STRO-1-negative (MACS$^-$) cell populations from the human free gingival margin. Cells were isolated from the free gingiva using a minimally invasive technique and were magnetically sorted using anti-STRO-1 antibodies. Subsequently,

the MACS⁺ and MACS⁻ cell fractions were characterized by flow cytometry for expression of CD14, CD34, CD45, CD73, CD90, CD105, CD146/MUC18 and STRO-1. Colony-forming unit (CFU) and multilineage differentiation potential were assayed for both cell fractions.Mineralisationmarker expression was examined using real-time polymerase chain reaction (PCR).MACS⁺ andMACS⁻ cell fractions showed plastic adherence. MACS⁺ cells, in contrast to MACS⁻ cells, showed all of the predefined mesenchymal stem/progenitor cell characteristics and a significantly higher number of CFUs (P,0.01). More than 95% of MACS⁺ cells expressed CD105, CD90 and CD73; lacked the haematopoietic markers CD45, CD34 and CD14, and expressed STRO-1 and CD146/MUC18. MACS⁻ cells showed a different surface marker expression profile, with almost no expression of CD14 or STRO-1, and more than 95% of these cells expressed CD73, CD90 and CD146/MUC18, as well as the haematopoietic markers CD34 and CD45 and CD105. MACS⁺ cells could be differentiated along osteoblastic, adipocytic and chondroblastic lineages. In contrast, MACS⁻ cells demonstrated slight osteogenic potential. Unstimulated MACS⁺ cells showed significantly higher expression of collagen I (P<0.05) and collagen III (P<0.01), whereas MACS⁻ cells demonstrated higher expression of osteonectin (P,0.05; Mann– Whitney). The present study is the first to compare gingival MACS⁺ and MACS⁻ cell populations demonstrating that MACS⁺ cells, in contrast to MACS⁻ cells, harbour stem/progenitor cell characteristics. This study also validates the effectiveness of the STRO-1/MACS⁺ technique for the isolation of gingival stem/progenitor cells. Human free gingival margin-derived STRO-1/MACS⁺ cells are a unique renewable source of multipotent stem/progenitor cells.

Keywords: Alkaline phosphatase; Collagen; Differentiation; Gingiva; Osteonectin; Osteopontin; Polymerase chain reaction; Stem cells.

1106. Effect of Periodontal Surgery on Osteoprotegerin Levels in Gingival Crevicular Fluid, Saliva, and Gingival Tissues of Chronic Periodontitis Patients

Sandy H. S. Hassan, Mahmoud I. El-Refai, Noha A. Ghallab, Rehab Fawzy Kasem and Olfat G. Shaker

This study was undertaken to investigate the OPG profiles in gingival crevicular fluid (GCF), saliva, and gingival tissues of chronic periodontitis (CP) patients in response to open flap debridement (OFD).

Subjects and Methods: The study included 30 subjects divided into 2 groups: 20 CP patients and 10 periodontally healthy subjects. Plaque index, gingival index, pocket depth, and clinical attachment level measurements were recorded for all subjects. GCF, salivary, and gingival samples were collected from all 30 subjects at baseline and 3 and 6 month after OFD from the 20 CP patients. GCF and salivary OPG levels were assessed by ELISA assay, while OPG expression in gingival tissues was examined by immunohistochemistry.

Results: GCF, salivary and gingival OPG profiles were significantly higher in control subjects compared to CP patients at baseline (P < 0.001). Within CP group, OPG levels in GCF, saliva, and gingival samples showed a significant increase at 3 and 6 months after OFD (P < 0.001) compared to baseline.

Although OPG values increased significantly in gingival samples and insignificantly in saliva after 3 months compared to 6 months, yet GCF levels were significantly decreased.

Conclusions: OPG might be considered as a diagnostic and prognostic biomarker of periodontal bone destruction. This trial is registered with NCT02160613.

Keywords: OPG; Saliva; GCF.

1107. Clinical Correlates of Common Corneal Neovascular Diseases: A Literature Review

Nizar Saleh Abdelfattah, Mohamed Amgad, Amira A Zayed, Hamdy Salem, Ahmed E Elkhanany, Heba Hussein and Nawal Abd El-Baky

A large subset of corneal pathologies involves the formation of new vessels (neovascularization), leading to compromised visual acuity. This article aims to review the clinical causes and presentations of corneal neovascularization (CNV) by examining the mechanisms behind common CNV-related corneal pathologies, with a particular focus on herpes simplex stromal keratitis, contact lenses-induced keratitis and CNV secondary to keratoplasty. Moreover, we reviewed CNV in the context of different types of corneal transplantation and keratoprosthesis, and summarized the most relevant treatment available so far.

Keywords: Cornea; Neovascularization; Herpes simplex Keratitis; Keratoplasty; Contact lens; Keratoprosthesis.

1108. Racemization of Aspartic Acid in Root Dentin as A Tool for Age Estimation in A Kuwaiti Population

Mohamed Amin Elfawal , Sahib Issa Alqattan and Noha Ayman Ghallab

Estimation of age is one of the most significant tasks in forensic practice. Amino acid racemization is considered one of the most reliable and accurate methods of age estimation and aspartic acid shows a high racemization reaction rate. The present study has investigated the application of aspartic acid racemization in age estimation in a Kuwaiti population using root dentin from a total of 89 upper first premolar teeth. The D/L ratio of aspartic acid was obtained by HPLC technique in a test group of 50 subjects and a linear regression line was established between aspartic acid racemization and age. The correlation coefficient (r) was 0.97, and the standard error of estimation was ±1.26 years. The racemization age "t" of each subject was calculated by applying the following formula: ln [(1+D/L)/(1-D/L)] =0.003181 t+ (-0.01591). When the proposed formula "estimated age t=ln [(1+D/L)/(1-D/L)] + 0.01591/0.003181" was applied to a validation group of 39 subjects, the range of error was less than one year in 82.1% of the cases and the standard error of estimation was ±1.12. The current work has established a reasonably significant correlation of the D-/L-aspartic acid ratio with age, and proposed an apparently reliable formula for calculating the age in Kuwaiti populations through aspartic acid racemization. Further research is required to find out whether similar findings are applicable to other ethnic populations.

Keywords: Age estimation; Aspartic acid; Racemization; Teeth.

Medicine Sector

Dept. of Orthodontics

1109. Comparison of Transverse Changes During Maxillary Expansion with 4-Point Bone-Borne and Tooth-Borne Maxillary Expanders

Mennatallah Ihab Mosleh, Mohamed Amgad Kaddah, Fatma Abdou Abd ElSayed and Hend Salah ElSayed

American Journal of Orthodontics and Dentofacial Orthopedics, 148: 599-607 (2015) IF: 1.382

The purposes of this study were to evaluate and compare the dentoskeletal changes concurrent with 4-point bone-borne and tooth-borne rapid maxillary expanders in growing children.
Methods: The study was conducted with 20 growing girls (ages, 12 6 0.6 years) with posterior crossbite. They were divided into 2 equal groups; patients in one group were treated with a tooth-borne maxillary hyrax expander (TBME), and those in the other group received a bone-borne maxillary hyrax expander (BBME) anchored directly to the palatal bone. Changes were assessed using cone-beam computed tomography. Images were taken before and immediately after expansion.
Results: Superimpositions of the 3-dimensional palatal images showed significant increases in skeletal widths at the canine, first premolar, and first molar areas in both groups. The TBME group had greater nasal width expansion. Regarding the transverse dentolinear measurements, significant increases were seen in both groups, whereas the TBME group showed a greater increase than the BBME group. Significant increases in the dentoangular measurements were seen in the TBME group only and were significantly greater than in the BBME group at the first premolars.
Conclusions: There were significant increases in facial and maxillary widths for the BBME group and in nasal width for the TBME group. Both expanders produced basal bone expansion at the level of the hard palate. The TBMEs produced more dental expansion, buccal rolling, and a greater increase in nasal width than did the BBMEs.
Keywords: Maxillary expansion; Bone borne; Tooth borne.

Faculty of Pharmacy

Dept. of Analytical Chemistry

1110. Green, Environment-Friendly, Analytical Tools Give Insights in Pharmaceuticals and Cosmetics Analysis

Heba M. Mohamed

Trends in Analytical Chemistry, 66: 176-192 (2015) IF: 6.472

Due to scientific and public concern about health and the environment, "Green", "Eco", "Environmentfriendly" practices have been introduced into different research areas. In analysis of pharmaceuticals and cosmetics, analytical techniques are used for routine analysis, stability studies and quality control, but they can greatly affect researchers' health and safety and have a harmful impact on environment. Consequently, researchers' attention is drawn towards greening analytical methodologies and progressively taking into account the principles of green analytical chemistry (GAC) within their analytical procedures. This review presents GAC principles implemented in pharmaceutical and cosmetics analysis with special focus on direct analytical methods that have no, or limited, sample preparation, "the most polluting" step, and studies that reduced the use of hazardous solvents or replaced them by more benign, environment-friendly solvents. There is also a brief description of other modifications for greening analytical methodologies.
Keywords: Cosmetics analysis; Direct analysis; Eco-friendly analysis; Environment friendly; Green analysis; Hazardous solvent; Pharmaceutical analysis; Solvent reduction.

1111. Design of A Stable Solidcontact Ionselective Electrode Based on Polyaniline Nanoparticles as Iontoelectron Transducer for application in Process Analytical Technology as A Realtime Analyzer

Mohamed K. Abd El-Rahman, Mamdouh R. Rezk, Amr M. Mahmoud and Mohamed R. Elghobashy

Sensors and Actuators B: Chemical, 208: 14-21 (2015) IF: 4.097

Process Analytical Technology (PAT) is an essential step forward in the pharmaceutical industry. Real-time analyzers will provide timely data on quality properties. The aim of this work was to develop ajunction between the pharmaceutical industry and recent advances in designing stable and reproduciblesolid-contact ion selective electrodes (SC-ISEs). Those sensors can be used as bench-top real-time analyzerfor in-process tracking of the concentration of active pharmaceuticals. We have exploited the long-termstability of the chemically prepared polyaniline (PANI) nanoparticles to be applied as an ion-to-electrontransducer layer between an ionophore-doped PVC membrane and glassy carbon electrodes. The inclu-sion of PANI nanoparticles added more stability to the electrical signal due to their excellent electronicand chemical properties. Moreover, the fast ion-to-electron transduction allows obtaining short responsetimes and the hydrophobic behavior avoids the formation of water layers at the electrode/membraneinterface. These results enabled the production of a series of SC-ISEs with improved piece-to-piece repro-ducibility where the potential was stable over 30 days with drift of 0.7 mV h^{-1}. The electrodes wereutilized for distigmine

bromide determination as a model pharmaceutical drug; the linear range was 1.0×10^{-6}–1.0×10^{-2} mol L^{-1} with a detection limit of 2.1×10^{-7} mol L^{-1}

Keywords: Conducting polymers; Ion-To-Electron transducers; Polyaniline nanoparticles; Process analytical technology; Distigmine bromide; Pharmaceutical industry.

1112. Ion Selective Electrode (Inline Analyzer) Versus Uvspectroscopy (Atline Analyzer); Which Strategy Offers More Opportunities for Realtime Monitoring of the Degradation Kinetics of Pyridostigminebromide

Mohamed K. Abd El-Rahman and Maissa Y. Salem

Pharmaceutical product quality is of vital importance for the patients' safety. In spite of the long history of development of spectroscopic methods for monitoring pharmaceutical products degradation kinetics;this work investigates the opportunities offered by electroanalytical methods (particularly, ion selectiveelectrodes) for in-line monitoring the degradation kinetics compared to at-line monitoring offered byconventional spectroscopic methods. For a meaningful comparison, pyridostigmine bromide (PB) waschosen as hydrolysable anti-cholinesterase drug and two novel strategies for monitoring of PB degra-dation kinetics catalyzed by hydroxyl ions are presented. The first strategy is achieved by continuousmeasurement of the decrease in the produced emf over time by incorporation of an in-site PB selectiveelectrode constructed using PVC membrane containing calix[6]arene as an ionophore. The second strat-egy utilizes UV spectrophotometry for at-line tracking of either the decrease of PB peak at 269 nm or theincrease of THMP peak at 320 nm over time. The use of these new methods provides real time observationand yields a continuous profile of the hydrolysis behavior of PB under various pH and temperature con-ditions. Moreover, a great advantage of these proposed in- and at-line systems is their higher accuracyfor rate constant estimation relative to other off-line methods.

Keywords: In-line monitoring; At-line monitoring; Hydrolysis kinetics; Ion-selective electrode; UV spectrophotometry; Activation energy.

1113. Development and Validation of an Ultraperformance Liquid Chromatography Method Coupled with Tandem Mass Spectrometry for Determination of Alizapride in Human Plasma

H. E. Zaazaa, E. S. Elzanfaly, A. T. Soudi and M. Y. Salem

The present study describes a novel liquid chromatographic-tandem mass spectrometric (LC-MS/MS) method for the estimation of alizapride in human plasma by electro spray ionization in the positive mode using triple quadrupole mass spectrometry using midodrine as an internal standard (IS). Sample pretreatment was carried out with solid-phase extraction using Bond Elut C18 cartridges, resulting in an average recovery of 86.45 ± 0.62 of the investigated compound. The chromatographic

separation was performed on an Acquity UPLC BEH shield reversed phase C18 column, using a gradient mobile phase consisting of acetonitrile and water (containing 0.1% formic acid) at a flow rate of 0.2 mL min^{-1}. The molecular ion of the analyte was detected in positive ionization by multiple reaction monitoring (MRM).

The mass transitions of m/z 316.24 → 124.19 and m/z 255.16 → 180.19 were used for detection of alizapride and its internal standard, respectively. The assay exhibited linear ranges from 1 to 1000 ng mL^{-1} for the analyte in human plasma. The LC-MS/MS method was fully validated for all the other parameters such as selectivity, linearity and range, LLOQ, precision and accuracy, matrix effect, recovery and stability. The lower limit of quantification (LLOQ) of the developed assay method for alizapride was 1 ng mL^{-1}. The intraday and interday variation of the current assay was evaluated with CV% within 4.8%, whereas the mean accuracy ranged from 93.59–100.19%. The samples were stable under the storage conditions for at least a month. In conclusion, the findings of the present study revealed the selectivity and sensitivity of this method for the estimation of alizapride in human samples. The proposed method was successfully applied to determine alizapride in human plasma samples after intramuscular administration of the drug.

Keywords: Alizapride; Ultraperformance liquid; Chromatography; Tandem mass spectrometry.

1114. Stability-Indicating Chromatographic Determination of Hydroquinone in Combination with Tretinoin and Fluocinolone Acetonide in Pharmaceutical for mulations with A Photodegradation Kinetic Study

Samah S. Abbas, Mohamed R. Elghobashy, Lories I. Bebawy and Rafeek F. Shokry

Two sensitive and selective stability-indicating methods were developed for simultaneous determination of the active pharmaceutical ingredient hydroquinone in combination with tretinoin and fluocinolone acetonide in their pure forms and within the pharmaceutical formulation. Method A was based on a gradient elution liquid chromatographic (HPLC) determination of the active ingredients, their degradation products (hydroquinone polymer, 1,4-benzoquinone, isotretinoin and fluocinolone acetonide photodegradation) and in the presence of the preservatives methyl and propyl parabens found in pharmaceutical formulations. Method B was a thin layer chromatography (TLC)-densitometry method using a chiral developing system for the separation and determination of the active ingredients, isotretinoin, the preservatives and 1,4-benzoquinone. The molecular weight of the hydroquinone polymer formed from its alkali degradation was characterized by gel permeation chromatography. The mechanism of fluocinolone acetonide photodegradation in acetonitrile at 254 nm was studied using single crystal X-ray diffraction. The degradation products, hydroquinone polymer and isotretinoin, were found in one batch of the pharmaceutical formulation analyzed near its expiry date. The proposed HPLC method was also used for a comparative kinetic study of the photodegradation of the active ingredients. Hydroquinone showed reversible zero order kinetics, tretinoin and fluocinolone acetonide followed complex kinetic reactions in acetonitrile within two hours. The results obtained were

statistically analyzed and compared with those obtained by applying the manufacturers method.

Keywords: Hydroquinone; Tretinoin; Fluocinolone acetonide; Stability and kinetic study; Chromatography; Single crystal X-ray diffraction.

1115. A Validated Chromatographic Method for Simultaneous Determination of Guaifenesin Enantiomers and Ambroxol HCL in Pharmaceutical for mulation

Ola Ahmed Saleh, Ali Mohamed Yehia, Aida Abd-El Sattar El-Azzouny and Hassan Youssef Aboul-Enein

The performance of three phenylcarbamate based chiral stationary phases was evaluated for the optimum separation of guaifenesin enantiomers. Resolution, enantioselectivity and capacity factors were compared simultaneously using four factor three level experimental design. Chiralcel OD provided the highest resolution and selectivity but the lowest capacity factor for the less retained enantiomer along with peak broadening for the more retained enantiomer. On the other hand, Lux amylose-2 provided the lowest parameters. Optimum resolution and selectivity with the highest capacity factors was provided by Lux cellulose-2 as stationary phase and ethanol/hexane (15 : 85 v/v) as mobile phase at a flow rate of 1.2 mL min^{-1} and column temperature at 19 ∘C. Extended separation of guaifenesin enantiomers and ambroxol HCl was accomplished using the same optimized chromatographic conditions. The proposed methods were applied for the determination of analytes in syrup formulation with high specificity. The method was validated as per International Conference on Harmonization guidelines and compared with a reported HPLC method.

Keywords: Guaifenesin; Ambroxol; Chiral separation; Experimental design.

1116. Application and Validation of an Eco-friendly TLC densitometric Method for Simultaneous Determination of Co-formulated Antihypertensive Agents

Nesrine T. Lamie and Heba M. Mohamed

Owing to the greater awareness that has arisen within the analytical community regarding the colossal negative influence of hazardous chemicals on both health and the environment, there is an increasing interest in developing more environment-friendly practices in different research areas. In this context, an eco-friendly TLC-densitometric method was designed, optimized and validated for the quantitative analysis of a ternary pharmaceutical mixture used for hypertension management, in the pure powdered form, synthetic mixtures and combined pharmaceutical formulation. The proposed method is based on the separation of the three co-formulated drugs; telmisartan (TL), hydrochlorothiazide (HZ) and amlodipine besylate (AM) on silica gel F254 plates, using green solvents as the developing system. The method was validated with regard to linearity, accuracy, precision, system suitability, and robustness. Comparison of the

suggested method to the reported conventional TLC-densitometric method, regarding their validation parameters and greenness profiles, was carried out. The suggested method was found to be more eco-friendly and more solvent-/time-saving; hence it can be used for quality control analysis of the studied mixture in a safer way.

Keywords: Telmisartan; Hydrochlorothiazide; Amlodipine; Green; Eco-friendly; TLC-densitometry.

1117. A Novel Surfactant Silica Gel Modified Carbon Paste Electrode in Micellar Media for Selective Determination of Diminazene Aceturate in the Presence of its Stabilizer

Hala E. Zaazaa, Nahla N. Salama, Shereen M. Azab, Shimaa A. Atty, Naglaa M. El-Kosy and Maissa Y. Salem

A novel irreversible anodic voltammetric method was introduced for selective determination of diminazene aceturate in the presence of phenazone as a stabilizer. A sensor based on a carbon paste electrode modified with silica gel in micellar media was introduced in a universal buffer solution (pH 2.0). The effect of various experimental parameters was investigated. Under optimized conditions, the differential pulse voltammetry exhibited acceptable analytical performances in terms of linearity (2.0 $\_10^{-6}$ to 3.0 $\_$ 10^{-4} mol L^{-1}) with correlation coefficients of; 0.9998 and 0.9996, detection limits; 5.27x10^{-9} and 1.2 x 10^{-8} mol L^{-1} and reproducibility (RSD < 2.0%) for the solution containing diminazene aceturate and phenazone respectively. The method is selective, sensitive and could be applied for simultaneous determination of diminazene aceturate and phenazone in veterinary preparations, spiked cattle's milk, and urine with satisfactory results.

Keywords: Modified carbon paste electrode; Diminazene aceturate.

1118. Static Headspace Gas Chromatographic Method for the Determination of Residual Solvents in Cephalosporins

Mohamed Gad, Hala Zaazaa, Sawsan Amer and Mohamed Korany

The pharmaceutical industry is facing a daunting challenge in the control of impurities. According to the GMP, measuring residual solvents is an integral part of impurity profile assessment for pharmaceutical products and is mandatory for the release testing of all active pharmaceutical ingredients or drug products according to regulatory authorities' requirements. Cephalosporins were surveyed for solvents being used in their synthetic processes, followed by establishment of a general method for the determination of these solvents. A sensitive static headspace gas chromatography (HSGC) with flame ionization detector (FID) protocol was successfully developed and validated for the determination of residual solvents commonly used in cephalosporin syntheses. The headspace and chromatographic parameters, such as split ratio, flow rate and oven programmed temperature, were optimized to enhance sensitivity and chromatographic resolution. Dimethyl-acetamide (DMA)–water 1: 1, v/v mixture as diluent, equilibration temperature of 120 °C

for 5 min, programmed temperature in the range of 40– 155 C, helium as carrier gas and a capillary column (6% cyanopropyl-phenyl–94% dimethyl polysiloxane) with 30 m x 0.32 mm id x 1.8 mm film thickness, were used. The proposed method was found to be suitable for the determination of 11 different residual solvents. Validation results indicated method specificity, sensitivity, and accuracy, where recoveries ranged from 98 to 103%. Regarding all analytes r ¼ 0.995–1.000, except for n-hexane and cyclohexane for which r ¼ 0.980 and 0.988, respectively.

Keywords: Static headspace gas chromatographic; Residual solvents.

1119. Micellar Enhanced Synchronous Spectrofluorimetric Method for Determination of Dasatinib in Tablets, Human Plasma and Urine: Application to in Vitro Drug Release and Content Uniformity Test

Hany W. Darwish and Ahmed H. Bakheit

A highly sensitive and simple spectrofluorimetric method has been developed and validated for the determination of dasatinib (DSB) in its pharmaceutical formulations, spiked human plasma and urine. The suggested method depended on studying the fluorescence spectral behavior of DSB in Cremophor EL (Cr EL) micellar system using synchronous scan technique (Dl ¼ 50 nm). In aqueous solution, the fluorescence intensity of DSB was markedly enhanced in the presence of Cr EL. The fluorescence–concentration plot was rectilinear over the range 25–500 ng mL1 , with lower detection limit of 2.70 ng mL1 . The proposed method was successfully applied to the assay of commercial tablets, spiked human plasma and urine samples as well as content uniformity test. The application of the proposed method was extended to test the in vitro drug release of DSB tablets, according to United States Pharmacopeia (USP) guidelines.

Keywords: Plasma; Urine; Spectrofluorimetric; Dasatinib.

1120. A New Method to Determine the New C-Met Inhibitor " Cabozantinib " in Dosage for m and Human Plasma Via Micelle- Enhanced Spectrofluorimetry

Hany W. Darwish, Ali S. Abdelhameed, Ahmed H. Bakheit and Amer M. Alanazi

A highly sensitive and simple micelle-enhanced spectrofluorimetric method was developed for the determination of cabozantinib (CBZ) in its pharmaceutical formulation and spiked human plasma without any derivatization. The proposed method is based on the investigation of the fluorescence spectral behavior of CBZ in a Cremophor RH 40 (Cr RH 40) micellar system. In aqueous solution, the fluorescence intensity of CBZ was greatly enhanced (nine fold) in the presence of Cr RH 40. The fluorescence intensity was measured at 343 nm after excitation at 244 nm. The fluorescence–concentration plot was linear over the range 25–800 ng mL^{-1}, with a lower detection limit of 13.34 ng mL^{-1}. The proposed method was successfully applied

to the determination of CBZ in laboratory-prepared dosage form and spiked human plasma. Recovery values of CBZ with the current method were 99.68 ± 0.88, 100.53 ± 0.51 and 100.44 ± 3.91% for pure powder, lab-prepared dosage form and spiked human plasma, respectively. The results were statistically compared with those obtained by the reported chromatographic method and were found to be in good agreement.

Keywords: Fluorescence; Cabozantinib; Micelle.

1121. Gallic Acid Magnetic Nanoparticles for Photocatalytic Degradation of Meloxicam: Synthesis, Characterization and Application to Pharmaceutical Wastewater Treatment

Ahmed H. Nadim, Medhat A. Al-Ghobashy, Marianne Nebsena and Mostafa A. Shehata

Environmentally friendly gallic acid coated magnetic nanoparticles (GA-MNP) have been synthesized and evaluated as a novel photocatalyst for degradation of meloxicam; a commonly prescribed nonsteroidal anti-inflammatory drug. The synthesized GA-MNP were characterized using transmission electron microscopy (TEM), Fourier transform infrared (FTIR) spectroscopy and dynamic light scattering.

Results showed the formation of core–shell MNP with a mean hydrodynamic diameter of 160.55 ± 5.02 nm and zeta potential of -42.4 ± 1.6 mV. A validated RP-HPLC stability-indicating assay was developed for monitoring of meloxicam concentration in the presence of its degradation products and for determination of the kinetics of degradation. Full factorial design (24) was employed in order to investigate the effects of pH, irradiation time, GA-MNP loading and initial meloxicam concentration on the efficiency of the process. The irradiation time was found to be the most significant parameter followed by initial meloxicam concentration and GA-MNP loading, respectively. At the optimized conditions, increasing GA-MNP loading to 5.00 mg mL-1 demonstrated superior photocatalytic activity when compared to bare MNP and TiO2NP. Meloxicam degradation was found to follow pseudo first order rate kinetics with Kobs and t0.5 of -0.0029 min-1 and 239 min, respectively. The protocol was successfully applied for treatment of incurred water samples collected during various cleaning validation cycles. A percentage degradation of 89.10 ± 0.13% was achieved upon irradiation of samples containing 64.57 ± 0.09 µg mL-1 with UV light (1012 µW cm-2, 8 h) in the presence of 5 mg mL-1 GA-MNP at pH 9.0 ± 0.05. It could be suggested that treatment of wastewaters collected during the cleaning validation of each pharmaceutical product, before pooling into the general waste pool, should improve the efficiency and economics of pharmaceutical wastewater treatment.

Keywords: Magnetic nanoparticles; Photocatalytic degradation; Pharmaceutical wastewater treatment.

1122. Validated Stability-Indicating RP-LC Method for the Determination of Pemirolast Potassium Investigation of Kinetic Behavior

Soheir Abd El-Fatah Weshahy, Maissa Salem Yaaqob, Marianne Nebsen Morcos, Dina Wahba Hassan and Nadia Fayek Youssef

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The stability of the anti-asthmatic drug pemirolast potassium was investigated under different stress conditions, including hydrolysis (acid and alkali), heat, light and oxidation as recommended by the ICH guidelines. The degradation process was found to take place only under alkaline and oxidative conditions. A stability-indicating RP-LC method was developed and validated for the determination of pemirolast potassium in the presence of its degradation products and process-related impurities. The chromatographic analysis was achieved on an Eclipse®, XDB-C18 (150 mm 4.6 mm, 5 mm) column, under isocratic elution by a mixture of water: methanol: glacial acetic acid, pH 3.5 50 : 50 : 0.3 (v/v/v), as a mobile phase, delivered at 1.0 ml min1 at 258 nm. Method validation was demonstrated to be selective, accurate and precise with good linearity over the concentration range of 1–10 mg ml1 with limits of detection and quantification of 21 and 69 ng ml1, respectively. Robustness against small modifications of pH and the percentage of the aqueous mobile phase was ascertained. The developed method was successfully applied for the analysis of pemirolast potassium in commercial eye drops and tablets; therefore it is highly suitable for routine analysis in QC labs. Moreover this method was utilized to investigate the kinetics of the alkaline degradation of pemirolast potassium, determine the order of the degradation rate constant, calculate the rate constant, half-life time and estimate the drug shelf-life (expiry date), and the activation energy of the degradation process

Keywords: Stability; Indicatingmethods; RP-LC method; Pemirolast potassium; Kinetic behavior.

1123. A Novel Approach for Spectrophotometric Determination of Succinylcholine in Pharmaceutical for mulation Via Host–Guest Complexation with Water-Soluble P-Sulfonatocalixarene†

Mohamed K. Abd El-Rahman and Amr M. Mahmoud

Succinylcholine (SUC) is a quaternary ammonium neuromuscular blocking agent. Direct determination of SUC in bulk drugs and formulations is a challenging analytical task due to the lack of a detectable chromophore and sensitive detection techniques. We have exploited both the strong UV absorbance of p-sulfonatocalix[4]arene (SCX4) and its outstanding complexation properties towards quaternary ammonium compounds to determine SUC. The characteristics of a host–guest complexation between SCX4 and SUC were investigated using UV and ^{1}H NMR spectroscopy. The Job's plot analysis reveals a 1 : 1 stoichiometry of the host–guest complex with a binding affinity K_a of 7.8 10^4 L mol^{-1}. This novel method is based on spectrophotometric measurement of the formed complex peak after resolving the overlap from the host SCX4 spectrum and was used for the quantitation of SUC. The linear range was found to be from 1.0 10^5 to 18.0 10^{-5} mol L^{-1} with a detection limit of 7.3 10^{-6} mol L^{-1} (2.88 mg mL^{-1}). This method is straightforward and shows high sensitivity. Moreover, it was successfully employed to determine SUC in pharmaceutical formulation. Subsequent statistical analysis of the obtained results and comparison with the official US pharmacopeial benchmark yielded favorable results.

1124. A Single Novel PVC Membrane for Dual Determination of Sulphadimethoxine and Malachite Green in Aquatic Environment

Fatma I. Khattab, Safa'a M. Riad, Mamdouh R. Rezk, Mohamed K. Abd El-Rahman and Hoda M. Marzouk

A novel ion-pair of a quaternary ammonium compound; malachite green (MG), and an anionic drug sulphadimethoxine sodium (SDM) was prepared. The developed ion pair was incorporated into poly (vinyl chloride)-based membrane sensors for the dual quantification of sulphadimethoxine (sensor 1) and malachite green (sensor 2) in aquatic environment. Linear responses of SDM and MG were obtained within a concentration range of 10^{-5}–10^{-2} and 10^{-5}–10^{-3} M, respectively. The slopes of 29.8 ± 0.31 and 35.5 ± 0.20 mV/decade were obtained over pH range of 6–8 and 4–8 using sensors 1 and 2, in order. The proposed sensors displayed useful analytical characteristics for determination of SDM in its pharmaceutical formulation and in aquatic environment with average recoveries of 100.92 ±0.19 and 102.47 ± 4.63, respectively. The recovery of MG in aquatic environment was 101.32 ±3.64.

Keywords: Aquatic environment; Malachite green; Poly (Vinyl Chloride); Potentiometry; Sulphadimethoxine sodium.

1125. Novel Strategy for Online Monitoring of the Degradation Kinetics of Propantheline Bromide Via A Calixarene-based Ion-selective Electrode

Mohamed K. Abd El-Rahman, Hala E. Zaazaa, Norhan Badr El-Din and Azza A. Moustafa

Propantheline bromide (PB) is a hydrolysable anti-cholinergic drug. A novel strategy for the online monitoring of PB degradation kinetics catalysed by hydroxyl ions is presented. This is achieved by the incorporation of an on-site PB-selective electrode constructed using as an ionophore. This sensor was used to track the hydrolysis of PB by continuous measurement of the decrease in the produced emf over time. The use of this new technique provides real-time observation and yields a continuous profile of the hydrolysis behaviour of PB under various pH conditions as well as the temperature dependency of each reaction. Moreover, a great advantage of this proposed on-line system is its higher accuracy for rate constant estimation relative to other off-line methods. This kinetic data analysis permitted the determination of the hydrolysis activation energy and prediction of the drug shelf life. The estimated activation energy from Arrhenius plot was 20.77 kcal mol-1.

Keywords: Propantheline bromide; On-line monitoring; Degradation kinetics; Calixarene; Ion-selective electrode; Activation energy.

1126. Novel Potentiometric Application for the Determination of Pantoprazole Sodium and Itopride Hydrochloride in their Pure and Combined Dosage form

Mona T. Ragabn, Mohamed K. Abd El Rahman, Nesrin K. Ramadan, Nariman A. El-Ragehy and Badr A. El-Zeany

Three sensitive and selective polyvinyl chloride (PVC) matrix membrane electrodes were developed and investigated. Sensor I was developed using tetraheptylammonium bromide (THB) as an anion exchanger with 2-nitrophenyl octyl ether (2-NPOE) as a plasticizer for the determination of the anionic drug pantoprazole sodium sesquihydrate (PAN). To determine the cationic drug itopride hydrochloride (ITH), two electrodes (sensors II and III) were developed using potassium tetrakis(4-chlorophenyl) borate (KTCPB) as a cation exchanger with dioctyl phthalate (DOP) as a plasticizer. Selective molecular recognition components, 2-hydroxypropyl-cyclodextrin (2- HP βCD) and 4-tert-butylcalix [8] arene (tBC8), were used as ionophores to improve the selectivity of sensors II and III, respectively. The proposed sensors had a linear dynamic range of 1×10^{-5} to 1×10^{-2} mol L^{-1} with Nernstian slopes of -54.83±0.451, 56.90±0.300, and 51.03±1.909 mV/decade for sensors I, II and III, respectively. The Nernstian slopes were also estimated over the pH ranges of 11–13, 3.5–8 and 4–7 for the three sensors, respectively. The proposed sensors displayed useful analytical characteristics for the determination of PAN and ITH in bulk powder, in laboratory prepared mixtures and in combined dosage forms with clear discrimination from several ions, sugars and some common drug excipients. The method was validated according to ICH guidelines. Statistical comparison between the results from the proposed method and the results from the reference methods showed no significant difference regarding accuracy and precision.

Keywords: Anionic exchanger; Ionophore; Ion selective electrodes; Itopride hydrochloride; Pantoprazole sodium Sesquihydrate; PVC.

1127. Strategy for Fabrication of Stable Tramadol Solid-Contact Ion-selective Potentiometric Sensor Based on Polyaniline Nanoparticles

Mohamed R. Elghobashy, Amr M. Mahmoud, Mamdouh R. Rezk and Mohamed K. Abd El-Rahman

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A solid-state ion-selective electrode for detection of tramadol has been fabricated utilizing polyaniline nanoparticles as an ion-toelectron transducer layer. The polyaniline (PANI) nanoparticles were synthesized by the micellar emulsion chemical polymerization method and the mean particle size was ~8 nm. The inclusion of PANI nanoparticles as an ion-to-electron transducer layer between an ionophore-doped PVC membrane and solid contact electrodes was carried out to improve the stability of the electrical signal. Both short and long-term stability studies were performed and compared to PANI free electrodes. Furthermore, the electrode's stability at various pH levels was investigated. The formation of water at PANI/solid contact interface was studied.
Results indicate an absence of the water layer at the interface. The PANI/solid contact electrodes had good piece-to-piece reproducibility and potential stability over 30 days. The fabricated electrodes were utilized for tramadol determination as a model pharmaceutical drug in the presence of all excipients; the linear range was 10-6 to 10-2 mol L-1, pH stability range was from 3–7 and the detection limit was calculated to be 3.9×10-7 mol L-1.

Keywords: Conducting polymer; Ion-To-electron transducers; Tramadol; Polyaniline; Nanoparticles.

1128. Development of A Sensitive UPLC-ESI-MS/MS Method for quantification of Sofosbuvir and its Metabolite, GS-331007, in Humanplasma: Application to A Bioequivalence Study

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Journal of Pharmaceutical and Biomedical Analysis, 114: 97-104 (2015) IF: 2.979

tA rapid and simple LC-MS/MS method was developed and validated for the simultaneous estimation of sofosbuvir (SF) and its metabolite GS-331007 (GS) using famotidine as an internal standard (IS). The Xevo TQD LC-MS/MS was operated under the multiple-reaction monitoring mode using electrospray ionization. Extraction with ethyl acetate was used in sample preparation. The prepared samples were chromatographed on Acquity UPLC HSS C$_{18}$(50 mm × 2.1 mm, 1.8 μm) column by pumping 0.1% formic acid and acetonitrile (50:50, v/v) in an isocratic mode at a flow rate of 0.3 ml/min. Method validation was performed as per the FDA guidelines and the standard curves were found to be linear in the range of10–2500 ng/ml for both SF and its metabolite. The intra-day and inter-day precision and accuracy results were within the acceptable limits. A very short run time of 1.2 min made it possible to analyze more than 300 human plasma samples per day. The developed assay method was successfully applied to a bioequivalence study in human volunteers.
Keywords: Sofosbuvir; GS-331007; UPLC-MS/MS; Plasma; Validation; Bioequivalence.

1129. Optimization of Photocatalytic Degradation of Meloxicam Using Titanium Dioxide Nanoparticles: Application to Pharmaceutical Wastewater Analysis, Treatment, and Cleaning Validation

Ahmed H. Nadim, Medhat A. Al-Ghobashy, Marianne Nebsen and Mostafa A. Shehata

Environmental Science and Pollution Research, 22: 15516-15525 (2015) IF: 2.828

Meloxicam is a commonly prescribed nonsteroidal anti-inflammatory drug with analgesic and fever-reducing effects. In this study, photocatalytic degradation of meloxicam in the presence of TiO2 nanoparticles (TiO2NP) was optimized and applied for pharmaceutical wastewater treatment. A validated stability-indicating orthogonal testing protocol (reversed-phase (RP)-HPLC and capillary zone electrophoresis) was developed and validated for monitoring of meloxicam concentration in the presence of its photodegradation products. Fractional factorial design was employed in order to investigate the effects of pH, irradiation time, UV light intensity, TiO2NP loading, and initial meloxicam concentration on the efficiency of the process. The light intensity was found as the most significant parameter followed by irradiation time and concentration, respectively. The most influencing interactions were noted between irradiation time-concentration and irradiation time-light intensity. The kinetics of meloxicam degradation was investigated at the optimum set of experimental conditions. The protocol was successfully applied for treatment of incurred water samples collected during various cleaning validation cycles. A percentage degradation of 77.34 ± 0.02 % was achieved upon irradiation of samples containing 64.57 ± 0.09 μg/mL with UV light (1012 μW/cm(2), 8 h) in the presence of 0.4 mg/mL TiO2NP at pH 9.0

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± 0.05. Treatment of wastewaters collected during the cleaning validation of each product separately rather than the combined waste should result in a significant improvement in the economics of pharmaceutical wastewater treatment. This could be attributed to the relatively small waste volumes and the ability to tailor the experimental conditions to achieve maximum efficiency.

Keywords: Pharmaceutical wastewater treatment; Cleaning validation; RP-HPLC; Photodegradation; Titanium dioxide Nanoparticles.

1130. Validated Green High-Performance Liquid Chromatographic Methods for the Determination of Coformulated Pharmaceuticals: A Comparison with Reported Conventional Methods

Eman S. Elzanfaly, Maha A. Hegazy, Samah S. Saad, Maissa Y. Salem and Laila E. Abd El Fattah

The introduction of sustainable development concepts to analytical laboratories has recently gained interest, however, most conventional high-performance liquid chromatography methods do not consider either the effect of the used chemicals or the amount of produced waste on the environment. The aim of this work was to prove that conventional methods can be replaced by greener ones with the same analytical parameters. The suggested methods were designed so that they neither use nor produce harmful chemicals and produce minimum waste to be used in routine analysis without harming the environment. This was achieved by using green mobile phases and short run times. Four mixtures were chosen as models for this study; clidinium bromide/chlordiazepoxide hydrochloride, phenobarbitone/ pipenzolate bromide, mebeverine hydrochloride / sulpiride , and chlorphenoxamine hydrochloride / caffeine / 8- chlorotheophylline either in their bulk powder or in their dosage forms. The methods were validated with respect to linearity, precision, accuracy, system suitability, and robustness. The developed methods were compared to the reported conventional high-performance liquid chromatography methods regarding their greenness profile. The suggested methods were found to be greener and more time- and solvent-saving than the reported ones; hence they can be used for routine analysis of the studied mixtures without harming the environment.

Keywords: Caffeine; Chlordiazepoxide; Green analytical Methods; Highperformance liquid Chromatography; Phenobarbitone.

1131. Profling of Esterifed Fatty Acids as Biomarkers in the Blood of Dengue Fever Patients Using A Microliter-Scale Extraction Followed by Gas Chromatography and Mass Spectrometry

Alaa Khedr, Maha Hegazy, Ahmed Kamal and Mostafa A. Shehata

An improved gas chromatography with mass spectrometry procedure was developed to highlight the esterified fatty acids in 100 μL blood of dengue fever patients in the early febrile phase versus healthy volunteers. 24 adult patients and 24 healthy volunteers were included in this study. The recoveries of targeted esterified fatty acids content were in the range of 92.10–101.00% using methanol/dichloromethane (2:1, v/v) as the extraction solvent. An efcient chromatographic separation of targeted 17 esteried fatty acid methyl esters was obtained. The limits of detection and quantification were within the range of 16–131 and 53–430 ng/mL, respectively. The relative standard deviation of intraday and interday precision values ranged from 0.4 to 5.0%. The statistical data treatment showed a significant decrease of the content of four saturated fatty acids, C14:0, C15:0, C16:0, and C18:0 (P value < 0.05), and also showed a decrease of the content of eight unsaturated fatty acids, C16:1, C18:3n6, C18:2n6, C18:1n9, C20:3n3, C20:4n6, C20:2, and C22:6n3 (P value < 0.05) in dengue fever patients. Moreover, the amount of three omega-6 fatty acids including C18:3n6, C18:2n6, and C20:4n6 was dramatically decreased in the blood of dengue fever patients to a limit of 50 ± 10%.

Keywords: Biomarkers; Dengue fever; Esteri; Ed fatty acids; Omega; 6 Fatty acids.

1132. Multi-Residues Determination of Antimicrobials in Fish Tissues by HPLC–ESI-MS/MS Method

Mamdouh R. Rezk, Safa'a M. Riad, Fatma I. Khattab and Hoda M. Marzouk

A rapid, simple, sensitive and specific LC–MS/MS method was developed and validated for the simultaneous quantification of four antimicrobials commonly used in aquaculture, namely ciprofloxacin (CPX), trimethoprim (TMP), sulphadimethoxine (SDM) and florphenicol (FLOR) in fish tissues. The LC–MS/MS was operated under the multiple-reaction monitoring mode using electrospray ionization. Sample preparation involves simple liquid extraction step followed by post-extraction clean-up step with n-hexane. The purified extracts were chromatographed on Agilent Poroshell 120 EC, C_{18} (50 mm × 3 mm, 2.7 m) column by pumping an isocratic mobile phase consisting of 0.1% formic acid in water:0.1% formic acid in methanol (20:80, by volume) at a flow rate of 0.4 mL/min. A detailed validation of the method was performed as per FDA guidelines and the standard curves were found to be linear in the range of 1–100 ng/g for both CPX and TMP, 0.5–100 ng/g for SDM and 1–50 ng/g for FLOR. The intra-day and inter-day precision and accuracy of the results were within the acceptable limits. A run time of 1.5 min for each sample made it possible to analyze multiple fish tissue samples per day. The developed assay method was successfully applied for the detection of antimicrobials in real fish tissue samples obtained from different fish farms.

Keywords: Antimicrobials; Aquaculture; Fish Tissues; Sample Extraction; LC–MS/MS.

1133. Carbon Nanotubes Versus Polyaniline Nanoparticles; Which Transducer Offers More Opportunities for Designing A Stable Solid Contact Ion-Selective Electrode

Amr M. Mahmoud, Mohamed K. Abd El-Rahman, Mohamed R. Elghobashy and Mamdouh R. Rezk

Sensors that exploit the unique properties of nanomaterials establish the most rapidly growing sensor research area. Remarkable achievements in nanotechnology and ion selective electrodes (ISEs) lead to explore a wide variety of approaches that develop completely calibration-free ISEs. Thiswork offers construction and comparative evaluation of the performance characteristics of multiwall-carbon nanotubes (CNTs) and polyaniline nanoparticles (PANI) as ion-to-electron transducers between an ionophore-doped PVC membrane and glassy carbon electrodes. With respect to the previously published reports, the current comparison was performed side by side under similar experimental conditions and hence the advantages and shortcomings of each transducer nanoparticles were directly highlighted in light of ISE figures of merit. Apparently, the inclusion of CNTs and PANI nanoparticles added more stability to the electrical signal due to their excellent electronic and chemical properties. Moreover, the fast ion-to-electron transduction allows obtaining short response times and the hydrophobic behavior avoids the formation of water layers at the electrode/membrane interface. These results enabled the production of a series of SC-ISEs with improved piece-to-piece reproducibility where the potential was stable over 60 and 45 days with drift of 0.8 mV h-1 and 0.7 mV h-1 for CNT and PANI based sensors, respectively. The electrodes are utilized for determination of buspirone as a model pharmaceutical drug.

Keywords: Conducting polymer; Ion-To-Electron Transducers; Polyaniline nanoparticles; Carbon nanotube; Buspirone.

1134. Development and Validation of Impurity-Profiling Uplc Method for the Determination of Sodium Cromoglicate and Tetryzolinehydrochloride: Application on Rabbit Aqueous Humor

Hayam M. Lotfy, Sarah S. Saleh, Nagiba Y. Hassan and Hesham Salem

tSodium cromoglicate (SCG), antihistaminic agent, and tetryzoline hydrochloride (TZH), a sympath-omimetic agent, are formulated together as an ophthalmic preparation. An ultra-performance liquidchromatographic method with UV detection (UPLC–UV) was developed and validated for the quantita-tive determination of SCG and TZH in rabbit aqueous humor. Due to the instability of both SCG and TZHunder alkaline conditions, the UPLC method was applied for their determination in the presence of theirpossible degradation impurities. The separation was performed using C18column (1.7 m particle size)and isocratic elution system with methanol: 1% o-phosphoric acid (65: 35, v/v).The optimum flow ratewas 0.5 ml/min and the detection was done at 230 nm. The suggested method was validated in compliancewith the ICH guidelines and was successfully applied for determination of sodium cromoglicate (SCG)and tetryzoline HCl (TZH) as prepared synthetically in laboratory mixtures, and in the presence of theiralkali-induced degradation impurities. The suggested method was effectively applied the determinationof spiked rabbit aqueous humor samples as well as commercial pharmaceutical formulation.

Keywords: Sodium cromoglicate; Tetryzoline HCL; UPLCA; Queous Humor; Degradation.

1135. Development and Validation of LC–MSMS Assay for the Determination of the Prodrug Dabigatran Etexilate and its Active Metabolites in Human Plasma

Eman G. Nouman, Medhat A. Al-Ghobashy and Hayam M. Lotfy

Dabigatran etexilate (DABE) is a low-molecular-weight prodrug that is converted after oral administration to dabigatran (DAB)—a directly acting oral anticoagulant. In this study, an LC–MSMS assay was developed and validated for the determination of DABE, free DAB and its equipotent O-glucuronide conjugates in plasma. Owing to the susceptibility of DABE and DAB to chemical hydrolysis, cleavage of the O-glucuronide moiety was carried out using β-glucuronidase enzyme. Free and total plasma concentrations of DAB were determined in incurred plasma samples before and after enzymatic cleavage (50 °C and 3 h), respectively. RP-HPLC separation was carried out using acetonitrile: water (30:70, v/v), adjusted to pH 3.0 using formic acid. Tandem mass spectrometric detection at positive electrospray ionization in the MRM mode was then employed for the determination of DABE and DAB. The analysis was carried out within 5.0 min over a linear concentration range of 1.00–600.00 ng/mL for the prodrug and its active metabolite. Validation was carried out according to FDA guidelines for bioanalytical method. The recoveries were higher than 89.48%, the accuracy was within 98.33–110.12% and the RSD was below 10% for the studied compounds in both incurred plasma and quality control samples.

Results: Of incurred sample re-analysis and incurred sample stability revealed less than 10% variability. This indicated good assay precision and sufficient stability of target analytes in their real matrix at the employed experimental conditions. The applicability of the assay for therapeutic drug monitoring and the determination of the pharmacokinetic parameters were demonstrated.

Keywords: LC- MSMS; Enzymatic cleavage; Dabigatran; Dabigatran etexilate; β-glucuronidase.

1136. Development and Validation of LC–MS/MS Assay for the Determination of the Prodrug Midodrine and its Active Metabolite Desglymidodrine in Plasma of Ascitic Patients: Application to Individualized Therapy and Comparative Pharmacokinetics

Ahmed A. Ali, Medhat A. Al-Ghobashy, Samar F. Farid and Mohamed A. Kassem

Midodrine (MD) is a prodrug that is converted after oral administration to Desglymidodrine (DMD). In this study, an LC–MS/MS assay was developed and validated for investigation of the pharmacokinetics of MD and DMD in non azotemic patients with liver cirrhosis and tense ascites. Results Were compared to those noted with healthy volunteers following the adminstration of a single oral dose of MD. Sample preparation was performed by liquid–liquid extraction using t-butyl methyl ether. HPLC separation was carried out using RP C18 column (4.6 mm × 50 mm, 5 µm). Isocratic elution was performed using methanol:0.2%

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formic acid (70:30, v/v) as the mobile phase, at a flow rate of 0.7 mL/min. Tandem mass spectrometric detection was employed at positive electrospray ionization in MRM mode for the determination of MD and DMD. Analysis was carried out within 1.0 min over a concentration range of 0.50–40.00 ng/mL for the prodrug and its active metabolite. The assay was validated according to FDA guidelines for bioanalytical method validation and satisfactory results were obtained. The applicability of the assay for the determination of the pharmacokinetic parameters of MD and DMD and personalized therapy was demonstrated in healthy volunteers and ascitic patients. Results Revealed significant differences in pharmacokinetic parameters among the studied groups. Such differences were explained on the basis of the medical condition and co-adminstered medications exerting possible drug–drug interaction. Results: Confirmed the need for implementation of reliable analysis tools for therapeutic dose adjustment.

Keywords: Individualized therapy; Comparative Pharmacokinetics; LC–MS / MS; Midodrine; Desglymidodrine; Ascites.

1137. Novel Spectrophotometric Methods for Simultaneous Determination of Amlodipine, Valsartan and Hydrochlorothiazide in their Ternary Mixture

Hayam M. Lotfy, Maha A. Hegazy, Shereen Mowaka and Ekram Hany Mohamed

This work represents a comparative study of two smart spectrophotometric techniques namely; successive resolution and progressive resolution for the simultaneous determination of ternary mixtures of Amlodipine (AML), Hydrochlorothiazide (HCT) and Valsartan (VAL) without prior separation steps. These techniques consist of several consecutive steps utilizing zero and/or ratio and/or derivative spectra. By applying successive spectrum subtraction coupled with constant multiplication method, the proposed drugs were obtained in their zero order absorption spectra and determined at their maxima 237.6 nm, 270.5 nm and 250 nm for AML, HCT and VAL, respectively; while by applying successive derivative subtraction they were obtained in their rst derivative spectra and determined at P , P for AML, HCT and VAL respectively. While in the progressive resolution, the concentrations of the components were determined progressively from the same zero order absorption spectrum using absorbance subtraction coupled with absorptivity factor methods or from the same ratio spectrum using only one divisor via amplitude modulation method can be used for the determination of ternary mixtures using only one divisor where the concentrations of the components are determined progressively. The proposed methods were checked using laboratory-prepared mixtures and were successfully applied for the analysis of pharmaceutical formulation containing the cited drugs. Moreover comparative study between spectrum addition technique as a novel enrichment technique and a well established one namely spiking technique was adopted for the analysis of pharmaceutical formulations containing low concentration of AML. The methods were validated as per ICH guidelines where accuracy, precision 233.7–246.8 230.8–246 ,P 261.4–278.2

Keywords: Progressive resolution; Spectrum subtraction; Absorbance subtraction; Amplitude modulation; Spectrum addition.

1138. Mean Centering of Ratio Spectra and Concentration Augmented Classical Least Squares in A Comparative Approach for Quantitation of Spectrally Overlapped Bands of Antihypertensives in for mulations

Maha Abdel Monem Hegazy and Yasmin Mohammed Fayez

Two different methods manipulating spectrophotometric data have been developed, validated and compared. One is capable of removing the signal of any interfering components at the selected wavelength of the component of interest (univariate). The other includes more variables and extracts maximum information to determine the component of interest in the presence of other components (multivariate). The applied methods are smart, simple, accurate, sensitive, precise and capable of determination of spectrally overlapped antihypertensives; hydrochlorothiazide (HCT), irbesartan (IRB) and candesartan (CAN). Mean centering of ratio spectra (MCR) and concentration residual augmented classical least-squares method (CRACLS) were developed and their efficiency was compared. CRACLS is a simple method that is capable of extracting the pure spectral profiles of each component in a mixture. Correlation was calculated between the estimated and pure spectra and was found to be 0.9998, 0.9987 and 0.9992 for HCT, IRB and CAN, respectively. The methods were successfully determined the three components in bulk powder, laboratory-prepared mixtures, and combined dosage forms. The results obtained were compared statistically with each other and to those of the official methods.

Keywords: Hydrochlorothiazide; Irbesartan candesartan; Spectrophotometry; MCR; CRACLS.

1139. A Comparative Study Between Three Stability Indicating Spectrophotometric Methods for the Determination of Diatrizoate Sodium in Presence of its Cytotoxic Degradation Product Based on Twowavelength Selection

Safaa M. Riad, Mohamed K. Abd El-Rahman, Esraa M. Fawaz and Mostafa A. Shehata

Three sensitive, selective, and precise stability indicating spectrophotometric methods for the determination of the X-ray contrast agent, diatrizoate sodium (DTA) in the presence of its acidic degradation product (highly cytotoxic 3,5-diamino metabolite) and in pharmaceutical formulation, were developed and validated. The first method is ratio difference, the second one is the bivariate method, and the third one is the dual wavelength method. The calibration curves for the three proposed methods are linear over a concentration range of 2–24 lg/mL. The selectivity of the proposed methods was tested using laboratory prepared mixtures. The proposed methods have been successfully

applied to the analysis of DTA in pharmaceutical dosage forms without interference from other dosage form additives. The results were statistically compared with the official US pharmacopeial method. No significant difference for either accuracy or precision was observed.

Keywords: Sodium diatrizoate ratio difference; Bivariate dual wavelength; Stability indicating; Methods.

1140. Different Signal Processing Techniques of Ratio Spectra for Spectrophotometric Resolution of Binary Mixture of Bisoprolol and Hydrochlorothiazide; A Comparative Study

Eman S. Elzanfaly, Said A. Hassan, Maissa Y. Salem and Badr A. El-Zeany

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 140: 334-343 (2015) IF: 2.353

Five signal processing techniques were applied to ratio spectra for quantitative determination of bisoprolol (BIS) and hydrochlorothiazide (HCT) in their binary mixture. The proposed techniques are Numerical Differentiation of Ratio Spectra (ND-RS), Savitsky–Golay of Ratio Spectra (SG-RS), Continuous Wavelet Transform of Ratio Spectra (CWT-RS), Mean Centering of Ratio Spectra (MC-RS) and Discrete Fourier Transform of Ratio Spectra (DFT-RS). The linearity of the proposed methods was investigated in the range of 2–40 and 1–22 lg/mL for BIS and HCT, respectively. The proposed methods were applied successfully for the determination of the drugs in laboratory prepared mixtures and in commercial pharmaceutical preparations and standard deviation was less than 1.5. The five signal processing techniques were compared to each other and validated according to the ICH guidelines and accuracy, precision, repeatability and robustness were found to be within the acceptable limit.

Keywords: Savitsky–golay; Wavelet transform; Fourier transform; Mean centering; Bisoprolol; Hydrochlorothiazide.

1141. Continuous Wavelet Transform, A Powerful Alternative to Derivative Spectrophotometry in Analysis of Binary and Ternary Mixtures: A Comparative Study

Eman S. Elzanfaly, Said A. Hassan, Maissa Y. Salem and Badr A. El-Zeany

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 151: 945-955 (2015) IF: 2.353

A comparative study was established between two signal processing techniques showing the theoretical algorithm for each method and making a comparison between them to indicate the advantages and limitations. The methods under study are Numerical Differentiation (ND) and Continuous Wavelet Transform (CWT). These methods were studied as spectrophotometric resolution tools for simultaneous analysis of binary and ternary mixtures. To present the comparison, the two methods were applied for the resolution of Bisoprolol (BIS) and Hydrochlorothiazide (HCT) in their binary mixture and for the analysis of Amlodipine (AML), Aliskiren (ALI) and Hydrochlorothiazide (HCT) as an example for ternary mixtures. By comparing the results in laboratory prepared mixtures, it was

proven that CWT technique is more efficient and advantageous in analysis of mixtures with severe overlapped spectra than ND. The CWT was applied for quantitative determination of the drugs in their pharmaceutical formulations and validated according to the ICH guidelines where accuracy, precision, repeatability and robustness were found to be within the acceptable limit.

Keywords: Derivative spectrophotometry; Continuous wavelet transform; Amlodipine; Aliskiren; Bisoprolol; Hydrochlorothiazide; Numerical differentiation.

1142. Stability Indicating Spectrophotometric and Spectrodensitometric Methods for the Determination of Diatrizoate Sodium in Presence of its Degradation Product

Mohamed K. Abd El-Rahman, Safaa M. Riad, Sherif A. Abdel Gawad, Esraa M. Fawaz and Mostafa A. Shehata

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 136: 1167-1174 (2015) IF: 2.353

Three sensitive, selective, and precise stability indicating methods for the determination of the X-ray contrast agent, diatrizoate sodium (DTA), in the presence of its acidic degradation product (highly cytotoxic 3,5 diamino metabolite) and in pharmaceutical formulation were developed and validated. The first method is a first derivative (D1) spectrophotometric one, which allows the determination of DTA in the presence of its degradate at 231.2 nm (corresponding to zero crossing of the degradate) over a concentration range of 2–24 lg/mL with mean percentage recovery $99.95 \pm 0.97\%$. The second method is the first derivative of the ratio spectra (DD1) by measuring the peak amplitude at 227 nm over the same concentration range as D1 spectrophotometric method, with mean percentage recovery $99.99 \pm 1.15\%$. The third method is a TLC-densitometric one, where DTA was separated from its degradate on silica gel plates using chloroform:methanol:ammonium hydroxide (20:10:2 by volume) as a developing system. This method depends on quantitative densitometric evaluation of thin layer chromatogram of DTA at 238 nm over a concentration range of 4–20 lg/spot, with mean percentage recovery $99.88 \pm 0.89\%$. The selectivity of the proposed methods was tested using laboratory-prepared mixtures. The proposed methods have been successfully applied to the analysis of DTA in pharmaceutical dosage forms without interference from other dosage form additives. The results were statistically compared with the official US pharmacopeial method. No significant difference for either accuracy or precision was observed.

Keywords: Sodium diatrizoate derivative; Spectrophotometry TLC-densitometry stability indicating; Methods.

1143. Application of Normalized Spectra in Resolving A Challenging Orphenadrine and Paracetamol Binary Mixture

Ali M. Yehia and Mohamed K. Abd El-Rahman

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Normalized spectra have a great power in resolving spectral overlap of challenging Orphenadrine (ORP) and Paracetamol (PAR) binary mixture, four smart techniques utilizing the

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normalized spectra were used in this work, namely, amplitude modulation (AM), simultaneous area ratio subtraction (SARS), simultaneous derivative spectrophotometry (S1DD) and ratio H-point standard addition method (RHPSAM). In AM, peak amplitude at 221.6 nm of the division spectra was measured for both ORP and PAR determination, while in SARS, concentration of ORP was determined using the area under the curve from 215 nm to 222 nm of the regenerated ORP zero order absorption spectra, in S1DD, concentration of ORP was determined using the peak amplitude at 224 nm of the first derivative ratio spectra. PAR concentration was determined directly at 288 nm in the division spectra obtained during the manipulation steps in the previous three methods. The last RHPSAM is a dual wavelength method in which two calibrations were plotted at 216 nm and 226 nm. RH point is the intersection of the two calibration lines, where ORP and PAR concentrations were directly determined from coordinates of RH point. The proposed methods were applied successfully for the determination of ORP and PAR in their dosage form.

Keywords: Normalized spectra; Binary mixture; Amplitude modulation; Simultaneous area ratio subtraction; Simultaneous derivative ratio; Ratio H-point standard addition method.

1144. Development of Normalized Spectra Manipulating Spectrophotometric Methods for Simultaneous Determination of Dimenhydrinate and Cinnarizine Binary Mixture

Nesrine T. Lamie and Ali M. Yehia

Simultaneous determination of Dimenhydrinate (DIM) and Cinnarizine (CIN) binary mixture with simple procedures were applied. Three ratio manipulating spectrophotometric methods were proposed. Normalized spectrum was utilized as a divisor for simultaneous determination of both drugs with minimum manipulation steps.

The proposed methods were simultaneous constant center (SCC), simultaneous derivative ratio spectrophotometry (S1DD) and ratio H-point standard addition method (RHPSAM). Peak amplitudes at isoabsorptive point in ratio spectra were measured for determination of total concentrations of DIM and CIN. For subsequent determination of DIM concentration, difference between peak amplitudes at 250 nm and 267 nm were used in SCC.

While the peak amplitude at 275 nm of the first derivative ratio spectra were used in S1DD; then subtraction of DIM concentration from the total one provided the CIN concentration. The last RHPSAM was a dual wavelength method in which two calibrations were plotted at 220 nm and 230 nm.

The coordinates of intersection point between the two calibration lines were corresponding to DIM and CIN concentrations.

The proposed methods were successfully applied for combined dosage form analysis, Moreover statistical comparison between the proposed and reported spectrophotometric methods was applied.

Keywords: Dimenhydrinate; Cinnarizine; Normalized spectra; Simultaneous constant center; Simultaneous derivative ratio; Ratio H-Point standard addition method.

1145. Novel Spectrophotometric Determination of Chloramphenicol and Dexamethasone in the Presence of Non Labeled Interfering Substances Using Univariate Methods and Multivariate Regression Model Updating

Maha A. Hegazy, Hayam M. Lotfy, Mamdouh R. Rezk and Yasmin Rostom Omran

Smart and novel spectrophotometric and chemometric methods have been developed and validated for the simultaneous determination of a binary mixture of chloramphenicol (CPL) and dexamethasone sodium phosphate (DSP) in presence of interfering substances without prior separation. The first method depends upon derivative subtraction coupled with constant multiplication. The second one is ratio difference method at optimum wavelengths which were selected after applying derivative transformation method via multiplying by a decoding spectrum in order to cancel the contribution of non labeled interfering substances. The third method relies on partial least squares with regression model updating. They are so simple that they do not require any preliminary separation steps. Accuracy, precision and linearity ranges of these methods were determined. Moreover, specificity was assessed by analyzing synthetic mixtures of both drugs. The proposed methods were successfully applied for analysis of both drugs in their pharmaceutical formulation. The obtained results have been statistically compared to that of an official spectrophotometric method to give a conclusion that there is no significant difference between the proposed methods and the official ones with respect to accuracy and precision.

Keywords: Derivative subtraction; Derivative transformation; Decoding spectrum; Regression model updating; Ratio spectra; Chloramphenicol and dexamethasone sodium phosphate.

1146. Comparative Study of Novel Versus Conventional Two-wavelength Spectrophotometric Methods for Analysis of Spectrally Overlapping Binary Mixture

Hayam M. Lotfy, Maha A. Hegazy, Mamdouh R. Rezk and Yasmin Rostom Omran

Smart spectrophotometric methods have been applied and validated for the simultaneous determination of a binary mixture of chloramphenicol (CPL) and prednisolone acetate (PA) without preliminary separation. Two novel methods have been developed; the first method depends upon advanced absorbance subtraction (AAS), while the other method relies on advanced amplitude modulation (AAM); in addition to the well established dual wavelength (DW), ratio difference (RD) and constant center coupled with spectrum subtraction (CC–SS) methods. Accuracy, precision and linearity ranges of these methods were determined. Moreover, selectivity was assessed by analyzing synthetic mixtures of both drugs. The proposed methods were successfully applied to the assay of drugs in their pharmaceutical formulations. No interference was observed from common additives and the validity of the methods was tested. The obtained results have been

statistically compared to that of official spectrophotometric methods to give a conclusion that there is no significant difference between the proposed methods and the official ones with respect to accuracy and precision.

Keywords: Advanced absorbance subtraction; Advanced amplitude modulation; Two-wavelength; Constant center; Spectrum subtraction; Chloramphenicol and prednisolone acetate.

1147. Novel Two Wavelength Spectrophotometric Methods for Simultaneous Determination of Binary Mixtures with Severely Overlapping Spectra

Hayam M. Lotfy, Sarah S. Saleh, Nagiba Y. Hassan and Hesham Salem

This work presents the application of different spectrophotometric techniques based on two wavelengths for the determination of severely overlapped spectral components in a binary mixture without prior separation. Four novel spectrophotometric methods were developed namely: induced dual wavelength method (IDW), dual wavelength resolution technique (DWRT), advanced amplitude modulation method (AAM) and induced amplitude modulation method (IAM). The results of the novel methods were compared to that of three well-established methods which were: dual wavelength method (DW), Vierordt's method (VD) and bivariate method (BV). The developed methods were applied for the analysis of the binary mixture of hydrocortisone acetate (HCA) and fusidic acid (FSA) formulated as topical cream accompanied by the determination of methyl paraben and propyl paraben present as preservatives. The specificity of the novel methods was investigated by analyzing laboratory prepared mixtures and the combined dosage form. The methods were validated as per ICH guidelines where accuracy, repeatability, inter-day precision and robustness were found to be within the acceptable limits. The results obtained from the proposed methods were statistically compared with official ones where no significant difference was observed. No difference was observed between the obtained results when compared to the reported HPLC method, which proved that the developed methods could be alternative to HPLC techniques in quality control laboratories.

Keywords: Dual wavelength; Amplitude modulation; Resolution; Hydrocortisone acetate; Fusidic acid; Bivariate.

1148. A Comparative Study of Different Aspects of Manipulating Ratio Spectra Applied for Ternary Mixtures: Derivative Spectrophotometry Versus Wavelet Transform

Hesham Salem, Hayam M. Lotfy, Nagiba Y. Hassan, Mohamed B. El-Zeiny and Sarah S. Saleh

This work represents a comparative study of different aspects of manipulating ratio spectra, which are: double divisor ratio spectra derivative (DR-DD), area under curve of derivative ratio (DR-AUC) and its novel approach, namely area under the curve correction method (AUCCM) applied for overlapped spectra; successive derivative of ratio spectra (SDR) and continuous

wavelet transform (CWT) methods. The proposed methods represent different aspects of manipulating ratio spectra of the ternary mixture of Ofloxacin (OFX), Prednisolone acetate (PA) and Tetryzoline HCl (TZH) combined in eye drops in the presence of benzalkonium chloride as a preservative. The proposed methods were checked using laboratoryprepared mixtures and were successfully applied for the analysis of pharmaceutical formulation containing the cited drugs. The proposed methods were validated according to the ICH guidelines. A comparative study was conducted between those methods regarding simplicity, limitation and sensitivity. The obtained results were statistically compared with those obtained from the reported HPLC method, showing no significant difference with respect to accuracy and precision.

Keywords: Ofloxacin prednisolone; Tetryzoline; Area under the curve; Derivative of ratio spectra; Wavelet transform.

1149. Computation of Geometric Representation of Novel Spectrophotometric Methods Used for the Analysis of Minor Components in Pharmaceutical Preparations

Hayam M. Lotfy, Sarah S. Saleh, Nagiba Y. Hassan and Hesham Salem

Novel spectrophotometric methods were applied for the determination of the minor component tetryzoline HCl (TZH) in its ternary mixture with ofloxacin (OFX) and prednisolone acetate (PA) in the ratio of (1:5:7.5), and in its binary mixture with sodium cromoglicate (SCG) in the ratio of (1:80). The novel spectrophotometric methods determined the minor component (TZH) successfully in the two selected mixtures by computing the geometrical relationship of either standard addition or subtraction. The novel spectrophotometric methods are: geometrical amplitude modulation (GAM), geometrical induced amplitude modulation (GIAM), ratio H-point standard addition method (RHPSAM) and compensated area under the curve (CAUC). The proposed methods were successfully applied for the determination of the minor component TZH below its concentration range. The methods were validated as per ICH guidelines where accuracy, repeatability, inter-day precision and robustness were found to be within the acceptable limits. The results obtained from the proposed methods were statistically compared with official ones where no significant difference was observed. No difference was observed between the obtained results when compared to the reported HPLC method, which proved that the developed methods could be alternative to HPLC techniques in quality control laboratories.

Keywords: Tetryzoline area under the curve; Amplitude modulation; H-Point; Sodium cromoglicate; Prednisolone acetate.

1150. Quantitative Determination of Zopiclone and its Impurity by Four Different Spectrophotometric Methods

Maha M. Abdelrahman, Ibrahim A. Naguib, Mohamed R. El Ghobashy and Nesma A. Ali

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Four simple, sensitive and selective spectrophotometric methods are presented for determination of Zopiclone (ZPC) and its impurity, one of its degradation products, namely; 2-amino-5-chloropyridine(ACP). Method A is a dual wavelength spectrophotometry; where two wavelengths (252 and 301 nm for ZPC, and 238 and 261 nm for ACP) were selected for each component in such a way that difference in absorbance is zero for the second one.

Method B is isoabsorptive ratio method by combining the isoabsorptive point (259.8 nm) in the ratio spectrum using ACP as a divisor and the ratio difference for a single step determination of both components.

Method C is third derivative (D3) spectrophotometric method which allows determination of both ZPC at 283.6 nm and ACP at 251.6 nm without interference of each other.

Method D is based on measuring the peak amplitude of the first derivative of the ratio spectra(DD1) at 263.2 nm for ZPC and 252 nm for ACP.

The suggested methods were validated according to ICH guidelines and can be applied for routine analysis in quality control laboratories. Statistical analysis of the results obtained from the proposed methods and those obtained from the reported method has been carried out revealing high accuracy and good precision.

Keywords: Zopiclone; 2 – Amino -5- Chloropyridine; Dual wavelength; Isoabsorptive ratio; Third derivative; First derivative of ratio spectra.

1151. Comparative Study of Spectrophotometric Methods Manipulating Ratio Spectra: an Application on Pharmaceutical Binary Mixture of Cinnarizine and Dimenhydrinate

Nesrine T. Lamie

Four simple, specific, accurate and precise spectrophotometric methods are developed and validated for simultaneous determination of cinnarizine (CIN) and dimenhydrinate (DIM) in a binary mixture with overlapping spectra, without preliminary separation.

The first method is dual wavelength spectrophotometry (DW), the second is a ratio difference spectrophotometric one (RD) which measures the difference in amplitudes between 250 and 270 nm of ratio spectrum, the third one is novel constant center spectrophotometric method (CC) and the fourth method is mean centering of ratio spectra (MCR). The calibration curve is linear over the concentration range of 4–20 and 10–45 lg/ml for CIN and DIM, respectively.

These methods are tested by analyzing synthetic mixtures of the above drugs and they are applied to commercial pharmaceutical preparation of the subjected drugs. The validity of results was assessed by applying standard addition technique. The results obtained were found to agree statistically with those obtained by a reported method, showing no significant difference with respect to accuracy and precision.

Keywords: Cinnarizine ; Dimenhydrinate dual wavelength ratio ; Difference constant center mean centering.

1152. Spectrophotometric Methods for Simultaneous Determination of Betamethasone Valerate and Fusidic Acid in their Binary Mixture

Hayam Mahmoud Lotfy, Hesham Salem, Mohammad Abd El-kawy and Ahmed Samir

Five spectrophotometric methods were successfully developed and validated for the determination of betamethasone valerate and fusidic acid in their binary mixture. Those methods are isoabsorptive point method combined with the first derivative (ISO Point – D1) and the recently developed and well established methods namely ratio difference (RD) and constant center coupled with spectrum subtraction (CC) methods, in addition to derivative ratio (1DD) and mean centering of ratio spectra (MCR). New enrichment technique called spectrum addition technique was used instead of traditional spiking technique. The proposed spectrophotometric procedures do not require any separation steps. Accuracy, precision and linearity ranges of the proposed methods were determined and the specificity was assessed by analyzing synthetic mixtures of both drugs. They were applied to their pharmaceutical formulation and the results obtained were statistically compared to that of official methods. The statistical comparison showed that there is no significant difference between the proposed methods and the official ones regarding both accuracy and precision.

Keywords: Ratio difference; Constant center; Mean centering.

1153. A Comparative Study of Novel Spectrophotometric Resolution Techniques

Hayam M. Lotfy, Shereen M. Tawakkol, Nesma M. Fahmy and Mostafa A. Shehata

Simultaneous determination of mixtures of lidocaine hydrochloride (LH), flucortolone pivalate (FCP), in presence of chlorquinaldol (CQ) without prior separation steps was applied using either successive or progressive resolution techniques. According to the concentration of CQ the extent of overlapping changed so it can be eliminated from the mixture to get the binary mixture of LH and FCP using ratio subtraction method for partially overlapped spectra or constant value via amplitude difference followed by ratio subtraction or constant center followed by spectrum subtraction spectrum subtraction for severely overlapped spectra. Successive ratio subtraction was coupled with extended ratio subtraction, constant multiplication, derivative subtraction coupled constant multiplication, and spectrum subtraction can be applied for the analysis of partially overlapped spectra. On the other hand severely overlapped spectra can be analyzed by constant center and the novel methods namely differential dual wavelength (D1 DWL) for CQ, ratio difference and differential derivative ratio (D1 DR) for FCP, while LH was determined by applying constant value via amplitude difference followed by successive ratio subtraction, and successive derivative subtraction. The spectra of the cited drugs can be resolved and their concentrations are determined progressively from the same ratio spectrum using amplitude modulation method. The specificity of the developed methods

was investigated by analyzing laboratory prepared mixtures and were successfully applied for the analysis of pharmaceutical formulations containing the cited drugs with no interference from additives. The proposed methods were validated according to the ICH guidelines. The obtained results were statistically compared with those of the official or reported methods; using student t-test, F-test, and one way ANOVA, showing no significant difference with respect to accuracy and precision.

Keywords: Differential dual wavelength; Differential derivative ratio; Constant value via amplitude difference.

1154. A Comparative Study of Smart Spectrophotometric Methods for Simultaneous Determination of Sitagliptin Phosphate and Metformin Hydrochloride in their Binary Mixture

Hayam M. Lotfy, Dalia Mohamed and Shereen Mowaka

Simple, specific, accurate and precise spectrophotometric methods were developed and validated for the simultaneous determination of the oral antidiabetic drugs; sitagliptin phosphate (STG) and metformin hydrochloride (MET) in combined pharmaceutical formulations. Three methods were manipulating ratio spectra namely; ratio difference (RD), ratio subtraction (RS) and a novel approach of induced amplitude modulation (IAM) methods. The first two methods were used for determination of STG, while MET was directly determined by measuring its absorbance at kmax 232 nm. However, (IAM) was used for the simultaneous determination of both drugs. Moreover, another three methods were developed based on derivative spectroscopy followed by mathematical manipulation steps namely; amplitude factor (P-factor), amplitude subtraction (AS) and modified amplitude subtraction (MAS). In addition, in this work the novel sample enrichment technique named spectrum addition was adopted. The proposed spectrophotometric methods did not require any preliminary separation step. The accuracy, precision and linearity ranges of the proposed methods were determined. The selectivity of the developed methods was investigated by analyzing laboratory prepared mixtures of the drugs and their combined pharmaceutical formulations. Standard deviation values were less than 1.5 in the assay of raw materials and tablets. The obtained results were statistically compared to that of a reported spectrophotometric method. The statistical comparison showed that there was no significant difference between the proposed methods and the reported one regarding both accuracy and precision.

Keywords: Induced amplitude modulation method; Amplitude subtraction method; Modified amplitude subtraction method.

1155. Novel Spectrophotometric Method for Selective Determination of Compounds in Ternary Mixtures (Dual Wavelength in Ratio Spectra)

Ahmed S. Saad

A simple selective spectrophotometric method for determination of compounds in ternary mixture was developed by combining

the resolution power of two well-known methods that are commonly used for binary mixtures; namely ratio difference method and dual wavelength. The new method (dual wavelength in ratio spectra) was successfully applied for the determination of a ternary mixture of betamethasone dipropionate (BM), clotrimazole (CT) and benzyl alcohol (BA) in pure powder form and in their pharmaceutical preparation. The difference in amplitudes (ΔP) in the ratio spectra at 252.0 and 258.0 nm (ΔP252.0–258.0nm) corresponds to BM, while ΔP266.8–255.4nm and ΔP254.2–243.5nm corresponds to CT and BA, respectively. The method was validated as per the USP 2005 guidelines. The developed method can be used in quality control laboratories for routine analysis of compounds in ternary mixtures.

Keywords: Spectrophotometry; Ratio difference (ΔP) method; Dual wavelength in ratio spectra method; DWRS; Ternary mixture.

1156. A Comparative Study of the Novel Spectrophotometric Methods Versus Conventional Ones for the Simultaneous Determination of Esomeprazole Magnesium Trihydrate and Naproxen in Their Binary Mixture

Hayam M. Lotfy, Sawsan M. Amer, Hala E. Zaazaa and Noha S. Mostafa

Two novel simple, specific, accurate and precise spectrophotometric methods manipulating ratio spectra are developed and validated for simultaneous determination of Esomeprazole magnesium trihydrate (ESO) and Naproxen (NAP) namely; absorbance subtraction and ratio difference. The results were compared to that of the conventional spectrophotometric methods namely; dual wavelength and isoabsorptive point coupled with first derivative of ratio spectra and derivative ratio. The suggested methods were validated in compliance with the ICH guidelines and were successfully applied for determination of ESO and NAP in their laboratory prepared mixtures and pharmaceutical preparation. No preliminary separation steps are required for the proposed spectrophotometeric procedures. The statistical comparison showed that there is no significant difference between the proposed methods and the reported method with respect to both accuracy and precision.

Keywords: Esomeprazole; Naproxen; Absorbance subtraction and ratio difference.

1157. Simultaneous Determination of Binary Mixture of Amlodipine Besylate and Atenolol Based on Dual Wavelengths

Nesrine T. Lamie

Four, accurate, precise, and sensitive spectrophotometric methods are developed for simultaneous determination of a binary mixture of amlodipine besylate (AM) and atenolol (AT). AM is determined at its kmax 360 nm (0D), while atenolol can be determined by four different methods. Method (A) is absorption factor (AF). Method (B) is the new ratio difference method (RD)

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which measures the difference in amplitudes between 210 and 226 nm. Method (C) is novel constant center spectrophotometric method (CC). Method (D) is mean centering of the ratio spectra (MCR) at 284 nm. The methods are tested by analyzing synthetic mixtures of the cited drugs and they are applied to their commercial pharmaceutical preparation. The validity of results is assessed by applying standard addition technique. The results obtained are found to agree statistically with those obtained by official methods, showing no significant difference with respect to accuracy and precision.

Keywords: Amlodipine atenolol; Absorption factor ratio difference constant center mean centering.

1158. A Study of Selective Spectrophotometric Methodsfor Simultaneous Determination of Itopride Hydrochloride and Rabeprazole Sodium Binary Mixture: Resolving Sever Overlapping Spectra

Heba M. Mohamed

Itopride hydrochloride (IT) and Rabeprazole sodium (RB) are co-formulated together for the treatment of gastro-esophageal reflux disease. Three simple, specific and accurate spectrophotometric methods were applied and validated for simultaneous determination of Itopride hydrochloride (IT) and Rabeprazole sodium (RB) namely; constant center (CC), ratio difference (RD) and mean centering of ratio spectra (MCR) spectrophotometric methods. Linear correlations were obtained in range of 10–110 lg/lL for Itopride hydrochloride and 4–44 lg/mL for Rabeprazole sodium. No preliminary separation steps were required prior the analysis of the two drugs using the proposed methods. Specificity was investigated by analyzing the synthetic mixtures containing the two cited drugs and their capsules dosage form. The obtained results were statistically compared with those obtained by the reported method, no significant difference was obtained with respect to accuracy and precision. The three methods were validated in accordance with ICH guidelines and can be used for quality control laboratories for IT and RB.

Keywords: Itopride hydrochloride; Rabeprazole sodium; Constant center; Ratio difference; Mean centering; Spectrophotometry.

1159. A Novel Pure Component Contribution Algorithm (PCCA) for Extracting Components' Contribution from Severely Overlapped Signals; an Application to UV-Spectrophotometric Data

Maha Abdel Monem Hegazy

A novel, simple and accurate algorithm capable of extracting the contribution of each component from a mixture signal where the components are completely overlapped was developed. It is based on the development of a coded function which eliminates the signal of interfering components using mean centering as a processing tool; finally the pure contribution of each component is extracted. The algorithm allows the determination

of each component as a single one. It was validated by the use of simulated data set of three overlapped signals and tested against simulated random noise. Two fit values were developed and calculated for optimization, one to test that that the absorptivity values of the extracted spectra are within the confidence limits of the slope and the other is the correlation between the pure and extracted spectra. It has been successfully applied to real UV data of binary mixture of Ibuprofen and Paracetamol and ternary mixture of Amiloride hydrochloride, Atenolol and Hydrochlorothiazide in tablets and capsules, respectively. The results were compared to previously reported separation method and no significant difference was found regarding both accuracy and precision.

Keywords: Pure component contribution; Overlapped signals Ternary; Binary; Algorithm.

1160. Validated Spectrophotometric Methods for Simultaneous Determination of Troxerutin and Carbazochrome in Dosage form

Fatma I. Khattab, Nesrin K. Ramadan, Maha A. Hegazy, Medhat A. Al-Ghobashy and Nermine S. Ghoniem

Four simple, accurate, sensitive and precise spectrophotometric methods were developed and validated for simultaneous determination of Troxerutin (TXN) and Carbazochrome (CZM) in their bulk powders, laboratory prepared mixtures and pharmaceutical dosage forms. Method A is first derivative spectrophotometry (D^1) where TXN and CZM were determined at 294 and 483.5 nm, respectively. Method B is first derivative of ratio spectra (DD^1) where the peak amplitude at 248 for TXN and 439 nm for CZM were used for their determination. Method C is ratio subtraction (RS); in which TXN was determined at its λ_{max} (352 nm) in the presence of CZM which was determined by D 1 at 483.5 nm. While, method D is mean cen- tering of the ratio spectra (MCR) in which the mean centered values at 300 nm and 340.0 nm were used for the two drugs in a respective order. The two compounds were simultaneously determined in the concentration ranges of 5.00–50.00 μg mL^1 and 0.5–10.0 μg mL^1 for TXN and CZM, respectively. The methods were validated according to the ICH guidelines and the results were statistically compared to the manufacturer's method.

Keywords: Carbazochrome troxerutin; Ratio subtraction Derivative mean centering spectrophotometry.

1161. Evaluating the Efficiency of Spectral Resolution of Univariate Methods Manipulating Ratio Spectra and Comparing to Multivariate Methods: an Application to Ternary Mixture in Common Cold Preparation

Azza Aziz Moustafa, Hesham Salem, Maha Hegazy and Omnia Ali

Simple, accurate, and selective methods have been developed and validated for simultaneous determination of a ternary mixture of Chlorpheniramine maleate (CPM), Pseudoephedrine HCl (PSE) and Ibuprofen (IBF), in tablet dosage form. Four univariate

methods manipulating ratio spectra were applied, method A is the double divisor-ratio difference spectrophotometric method (DD-RD). Method B is double divisor derivative ratio spectrophotometric method (DD-RD). Method C is derivative ratio spectrum-zero crossing method (DRZC), while method D is mean centering of ratio spectra (MCR). Two multivariate methods were also developed and validated, methods E and F are Principal Component Regression (PCR) and Partial Least Squares (PLSs). The proposed methods have the advantage of simultaneous determination of the mentioned drugs without prior separation steps. They were successfully applied to laboratory-prepared mixtures and to commercial pharmaceutical preparation without any interference from additives. The proposed methods were validated according to the ICH guidelines. The obtained results were statistically compared with the ofcial methods where no signicant difference was observed regarding both accuracy and precision.

Keywords: Univariate methods; Multivariate methods; Ratio spectra; Chlorpheniramine maleate; Pseudoephedrine HCL; Ibuprofen.

1162. Novel Spectrophotometric Determination of Flumethasone Pivalate and Clioquinol in their Binary Mixture and Pharmaceutical for mulation

Eglal A. Abdel-Aleem, Maha A. Hegazy, Nour W. Sayed, M. Abdelkawy and Rehab M. Abdelfatah

This work is concerned with development and validation of three simple, specific, accurate and precise spectrophotometric methods for determination of flumethasone pivalate (FP) and clioquinol (CL) in their binary mixture and ear drops. Method A is a ratio subtraction spectrophotometric one (RSM). Method B is a ratio difference spectrophotometric one (RDSM), while method C is a mean center spectrophotometric one (MCR). The calibration curves are linear over the concentration range of 3–45 μg/mL for FP, and 2– 25 μg/mL for CL. The specificity of the developed methods was assessed by analyzing different laboratory prepared mixtures of the FP and CL. The three methods were validated as per ICH guidelines; accuracy, precision and repeatability are found to be within the acceptable limits.

Keywords: Flumethasone; Clioquinol; Ratio subtraction; Ratio difference; Mean centering; Binary mixture.

1163. A Novel Spectral Resolution and Simultaneous Determination of Multicomponent Mixture of Vitamins B1, B6, B12, Benfotiamine and Diclofenac in Tablets and Capsules by Derivative and MCR–ALS

Maha A Hegazy, Nada S Abdelwahab and Ahmed S Fayed

A novel method was developed for spectral resolution and further determination of five-component mixture including Vitamin B complex (B1, B6, B12 and Benfotiamine) along with the commonly co-formulated Diclofenac. The method is simple, sensitive, precise and could efficiently determine the five components by a complementary application of two different techniques. The first is univariate second derivative method that was successfully applied for determination of Vitamin B12. The second is Multivariate Curve Resolution using the Alternating Least Squares method (MCR–ALS) by which an efficient resolution and quantitation of the quaternary spectrally overlapped Vitamin B1, Vitamin B6, Benfotiamine and Diclofenac sodium were achieved. The effect of different constraints was studied and the correlation between the true spectra and the estimated spectral profiles were found to be 0.9998, 0.9983, 0.9993 and 0.9933 for B1, B6, Benfotiamine and Diclofenac, respectively. All components were successfully determined in tablets and capsules and the results were compared to HPLC methods and they were found to be statistically non-significant.

Keywords: Chemometrics; Derivative; MCR–ALS; Multi-vitamin preparation; Diclofenac; Benfotiamine.

1164. Application of the Ratio Difference Spectrophotometry to the Determination of Ibuprofen and Famotidine in their Combined Dosage form; Comparison with Previously Published Spectrophotometric Methods

Hala E. Zaazaa, Eman S. Elzanfaly, Aya T. Soudi and Maissa Y. Salem

Ratio difference spectrophotometric method was developed for the determination of ibuprofen and famotidine in their mixture form. Ibuprofen and famotidine were determined in the presence of each other by the ratio difference spectrophotometric (RD) method where linearity was obtained from 50 to 600 lg/mL and 2.5 to 25 lg/mL for ibuprofen and famotidine, respectively. The suggested method was validated according to ICH guidelines and successfully applied for the analysis of ibuprofen and famotidine in their pharmaceutical dosage forms without interference from any additives or excipients.

Keywords: Ibuprofen; Famotidine; Ratio difference (RD).

1165. Spectrofluorimetric Determination of 3-Methylflavone-8-carboxylic Acid, the Main Active Metabolite of Flavoxate Hydrochloride in Human Urine

Hala E. Zaazaa, Afaf O. Mohamed, Maha A. Hawwam and Mohamed Abdelkawy

A simple, sensitive and selective spectrofluorimetric method has been developed for the determination of 3-methylflavone-8-carboxylic acid as the main active metabolite of flavoxate hydrochloride in human urine. The proposed method was based on the measurement of the native fluorescence of the metabolite in methanol at an emission wavelength 390 nm, upon excitation at 338 nm. Moreover, the urinary excretion pattern has been calculated using the proposed method. Taking the advantage that 3-methylflavone-8-carboxylic acid is also the alkaline degradate,

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the proposed method was applied to in vitro determination of flavoxate hydrochloride in tablets dosage form via the measurement of its corresponding degradate. The method was validated in accordance with the ICH requirements and statistically compared to the official method with no significant difference in performance.

Keywords: Flavoxate; Hydrochloride; Spectrofluorimetry; 3-Methylflavone; 8-Carboxylic acid; Pharmaceutical formulation; Urine.

1166. Comparative Study on the Selectivity of Various Spectrophotometric Techniques for the Determination of Binary Mixture of Fenbendazole and Rafoxanide

Ahmed S. Saad, Ali K. Attia, Manal S. Alaraki and Eman S. Elzanfaly

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 150: 682-690 (2015) IF: 2.353

Five different spectrophotometric methods were applied for simultaneous determination of fenbendazole and rafoxanide in their binary mixture; namely first derivative, derivative ratio, ratio difference, dual wavelength and H-point standard addition spectrophotometric methods. Different factors affecting each of the applied spectrophotometric methods were studied and the selectivity of the applied methods was compared. The applied methods were validated as per the ICH guidelines and good accuracy; specificity and precision were proven within the concentration range of 5–50 lg/mL for both drugs. Statistical analysis using one-way ANOVA proved no significant differences among the proposed methods for the determination of the two drugs. The proposed methods successfully determined both drugs in laboratory prepared and commercially available binary mixtures, and were found applicable for the routine analysis in quality control laboratories.

Keywords: Fenbendazole; Rafoxanide; First derivative ratio derivative and difference; Dual wavelength; H-Point standard addition method.

1167. Simultaneous Determination of A Binary Mixture of Pantoprazole Sodium and Itopride Hydrochloride by Four Spectrophotometric Methods

Nesrin K. Ramadan, Nariman A. El-Ragehy, Mona T. Ragab and Badr A. El-Zeany

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 137: 463-470 (2015) IF: 2.353

Four simple, sensitive, accurate and precise spectrophotometric methods were developed for the simultaneous determination of a binary mixture containing Pantoprazole Sodium Sesquihydrate (PAN) and Itopride Hydrochloride (ITH). Method (A) is the derivative ratio method (1DD), method (B) is the mean centering of ratio spectra method (MCR), method (C) is the ratio difference method (RD) and method (D) is the isoabsorptive point coupled with third derivative method (3D). Linear correlation was obtained in range 8–44 µg/mL for PAN by the four proposed methods, 8–40 µg/mL for ITH by methods A, B and C and 10–40 µg/mL for ITH by method D. The suggested methods were

validated according to ICH guidelines. The obtained results were statistically compared with those obtained by the official and a reported method for PAN and ITH, respectively, showing no significant difference with respect to accuracy and precision.

Keywords: Derivative ratio; Isoabsorptive point; Itopride; Mean centering; Pantoprazole; Ratio difference.

1168. Conventional Univariate Versus Multivariate Spectrophotometric Assisted Techniques for Simultaneous Determination of Perindopril Arginin and Amlodipine Besylate in Presence of their Degradation Products

Maha A. Hegazy, Samah S. Abbas, Hala E. Zaazaa and Hebatallah M. Essam

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 150: 940-948 (2015) IF: 2.353

The resolving power of spectrophotometric assisted mathematical techniques were demonstrated for the simultaneous determination of perindopril arginin (PER) and amlodipine besylate (AML) in presence of their degradation products. The conventional univariate methods include the absorptivity factor method (AFM) and absorption correction method (ACM), which were able to determine the two drugs, simulta- neously, but not in the presence of their degradation products.

In both methods, amlodipine was deter- mined directly at 360 nm in the concentration range of 8–28 µg mL (-1), on the other hand perindopril was determined by AFM at 222.2 nm and by ACM at 208 nm in the concentration range of 10–70 µg mL(-1). Moreover, the applied multivariate calibration methods were able for the determination of perindopril and amlodipine in presence of their degradation products using concentration residuals augmented clas- sical least squares (CRACLS) and partial least squares (PLS).

The proposed multivariate methods were applied to 19 synthetic samples in the concentration ranges of 60–100 µg mL (-1) perindopril and 20– 40 µg mL (-1) amlodipine. Commercially available tablet formulations were successfully analysed using the developed methods without interference from other dosage form additives except PLS model, which failed to determine both drugs in their pharmaceutical dosage form.

Keywords: Perindopril arginin; Amlodipine besylate; Absorbance correction method; Absorptivity factor method; CRACLS; PLS.

1169. Smart Manipulation of Ratio Spectra for Resolving A Pharmaceutical Mixture of Methocarbamol and Paracetamol

Hebatallah M. Essam and Mohamed K. Abd El-Rahman

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 141: 1-9 (2015) IF: 2.353

Two smart, specific, accurate and precise spectrophotometric methods manipulating ratio spectra are developed for simultaneous determination of Methocarbamol (METH) and Paracetamol (PAR) in their combined pharmaceutical formulation without preliminary separation. Method A, is an extended ratio subtraction one (EXRSM) coupled with ratio subtraction method

(RSM), which depends on subtraction of the plateau values from the ratio spectrum.

Method B is a ratio difference spectrophotometric one (RDM) which measures the difference in amplitudes of ratio spectra between 278 and 286 nm for METH and 247 and 260 nm for PAR. The calibration curves are linear over the concentration range of 10– 100 μg mL^{-1} and 2–20 μg mL^{-1} for METH and PAR, respectively.

The specificity of the developed methods was investigated by analyzing different laboratory prepared mixtures of the two drugs. Both methods were applied successfully for the determination of the selected drugs in their combined dosage form. Furthermore, validation was performed according to ICH guidelines; accuracy, precision and repeatability are found to be within the acceptable limits. Statistical studies showed that both methods can be competitively applied in quality control laboratories.

Keywords: Methocarbamol paracetamol; Ratio subtraction extended ; Ratio subtraction; Ratio difference spectrophotometry.

1170. A Comparative Study of Liquid and Solid Inner Contact Roxatidine Acetate Ion-Selective Electrode Membranes

Mohamed K. Abd El-Rahman, Hala E. Zaazaa, Samah S. Abbas, Badr El-Zeany, Zeinab A. EL-Sherif and Dalia A. EL-Haddad

A comparative study was conducted using two designs of a roxatidine acetate (ROX)-selective electrode; a conventional liquid inner contact called electrode A and a graphite-coated solid contact called electrode B.

The fabrication of electrodes was based on roxatidine-tetraphenylborate (ROX-TPB) as an ion-association complex in a PVC matrix using different plasticizers. Electrode A has a linear dynamic range of 2.2 10^{-5} mol/L to 1.0 10^{-2} mol/L, with a Nernstian slope of 54.7 mV/decade and a detection limit of 1.4 10^{-6} mol/L. Electrode B shows linearity over the concentration range of 1.0 106 mol/L to 1.0 102 mol/L, with a Nernstian slope of 51.2 mV/decade and a limit of detection of 1.1 10^{-7} mol/L which is remarkably improved as a result of diminishing ion fluxes in this solid contact, ion-selective electrode. The proposed sensors display useful analytical characteristics for the determination of ROX in bulk powder and its pharmaceutical formulation.

The present electrodes show clear discrimination of ROX from several inorganic, organic ions, sugars, some common drug excipients and the degradation product (3-[3-(1-piperidinyl methyl) phenoxy] propyl amine) of ROX. Furthermore, the proposed electrodes were utilized for the determination of ROX in human plasma, where electrode B covers drug Cmax which indicated its applicability to pharmacokinetic, bioavailability and bioequivalent studies.

The results obtained by the proposed electrodes were statistically analyzed and compared with those obtained by a reported HPLC method. No significant difference for either accuracy or precision was observed.

Keywords: Comparative study Roxatidine acetate; Liquid inner contact electrode; Solid contact electrode; Degradation product; Plasma.

1171. Novel Pioglitazone Nanomaterial Based Screen Printed Sensors

Amal M. Abou Al-Alamein, Manal S. Kamel, Maha. M. Abou El-Alamin and Elmorsy Khaled

Sensitive disposable potentiometric sensors for determination of pioglitazone hydrochloride (PIO) have been constructed. The fabricated screen printed electrodes (SPEs) are based on multi-walled carbon nanotubes - polyvinyl chloride (MWNT-PVC) composite and crown ether as sensing ionophore. Electrode matrices compositions were optimized referring the effect of nature and content the sensing ionophore, anionic sites, plasticizer and nanomaterial. Detailed investigation revealed that sensors incorporated with 15-crown-5 ether as sensing ionophore, sodium tetrakis (4-florophenyl) borate (NaTFPB) as anionic site and 2-fluorophenyl 2-nitrophenyl ether (*f*-PNPE) as membrane plasticizer showed the best electroanalytical performances. The fabricated electrodes worked satisfactorily in the PIO concentration range from 10^{-6} to 10^{-2} mol L^{-1} with Nernstian compliance of 61.05±0.5 mV decade^{-1} and detection limit of 8×10^{-7} mol L^{-1}. Carbon nanotubes remarkably improved the potential stability and lifetime of the fabricated sensors. The sensors have been successfully applied for the potentiometric determination of PIO in pharmaceutical preparations under batch experiments and flow injection analysis (FIA) with acceptable average recoveries. The relative simple fabrication protocol of disposable sensor, high sensitivity and stability of the method represents a promising approach for drug quality control laboratories.

Keywords: Pioglitazone; Screen-printed potentiometric sensor; Carbon nanotubes; Flow injection analysis; Pharmaceutical analysis.

1172. Validated Chiral Chromatographic Methods for Clopidogrel Bisulphate and its Related Substances in Bulk Drug and Pharmaceutical Dosage for ms

Eman S. Elzanfaly, Hala E. Zaazaa, Aya T. Soudi and Maissa Y. Salem

Two validated chromatographic methods developed for the analysis of S clopidogrel bisulphate in the presence of its related substances listed in the United States and British Pharmacopoeias including its inactive R enantiomer are described. The first method is a simple thin layer chromatographic (TLC) method where separation is performed on pre-coated silica gel 60 F254 plates using methanol/diethylamine/heptanes/water containing 20 mg vancomycin hydrochloride (7 : 7 : 1.5 : 0.5 vol. %) as a mobile phase. Rf values were found to be 0.69, 0.74, 0.78, 0.84 and 0.88 for R clopidogrel, S clopidogrel, related substances A, B1 and B2, respectively. The second method depends on the separation by HPLC on a Lux polysaccharide chiral column with UV detection at 220 nm using 0.1 vol. % diethyl amine in methanol pumped at a rate of 1 mL min-1. Retention times were found to be 1.90 min, 2.82 min, 3.00 min, 3.27 min and 3.71 min for the related substances A, B1, C which are clopidogrel R enantiomer, B2, and S clopidogrel, respectively. The proposed methods were validated in accordance with the ICH guidelines

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and successfully applied to the determination of S clopidogrel bisulphate in pure powder and dosage forms without interference from the excipients and to affirm the dosage form to be pure S clopidogrel and devoid of the R enantiomer, which is inactive.
Keywords: HPLC; TLC densitometry; S clopidogrel; R clopidogrel; Related substances; Chiral separation.

1173. Assessment of the Effects of Glycosylation on the Pattern and Kinetics of Degradation of Lenograstim in Comparison to Filgrastim Using A Stability-Indicating Orthogonal Testing Protocol

Lamiaa A. Hassan, Medhat A. Al-Ghobashy, Faten A. Fathalla and Samah S. Abbas

In the biopharmaceutical industry, protein aggregation and/or degradation has profound pathological implications and is encountered routinely during production, shipping, storage and administration. Lenograstim (glycosylated recombinant human granulocyte colony-stimulating factor) was subjected to stress conditions, namely, oxidation, pH, temperature, agitation and repeated freeze–thaw to generate all possible degradation products. An orthogonal stability-indicating testing protocol (RP-HPLC, SE-HPLC, ELISA and SDS-PAGE) was developed and validated for assessment of the pattern and kinetics of aggregation/degradation, under the studied experimental conditions.
Results: Indicated clearly that Lenograstim is susceptible to degradation induced by the studied stress conditions. However, Lenograstim was found relatively more stable than Filgrastim (non-glycosylated recombinant human granulocyte colony-stimulating factor) which was attributed to the effect of glycosylation. Oxidized forms and high molecular weight aggregates of Lenograstim and Filgrastim were detected in all samples subjected to stress conditions to different degrees. ELISA assay and SDS-PAGE results were generally in agreement to those obtained using SE-HPLC assay which confirmed its selectivity to the intact drug. However, formation of soluble aggregates of both drugs was found to occur via physical adsorption and formation of intermolecular disulfide bonds.
Results: Confirmed the need for an orthogonal testing protocol since it was impossible to reveal all types of degradation products using a single technique.
Results: Raised a concern about the efficacy and safety of such sensitive products and highlighted the need for simple tools to inspect biologics for soluble aggregates and sub-visible particles before administration.
Keywords: RP-HPLC; SE-HPLC; Stability of biopharmaceuticals; Lenograstim; Filgrastim.

1174. Development and Validation of A Stability-Indicating Micellar Liquid Chromatographic Method for the Determination of Timolol Maleate in the Presence of its Degradation Products

Mohamed S. Rizk, Hanan A. Merey, Shereen M. Tawakkol and Mona N. Sweilam

A stability-indicating micellar liquid chromatographic (MLC) method was developed and validated for the quantitative determination of timolol maleate (TM) in the presence of its degradation products resulting from accelerated degradation in a run time not more than 8 min. TM was subjected to stress conditions of hydrolysis (including alkaline, acidic and thermal hydrolysis) and oxidation. An isocratic, rapid and mobile phase saving the micellar LC method was developed with a BioBasic phenyl column (150 3 1.0 mm, 5 mm particle size) and a micellar mobile phase composed of 0.1 M sodium dodecyl sulfate, 10% of 1-propanol and 0.1% of triethylamine in 0.035 M orthophosphoric acid. The flow rate of the mobile phase was 0.1 mL/min. UV detection was adjusted at 298 nm and performed at room temperature. The method has been validated according to the International Conference on Harmonisation guidelines. The method is successfully applied for the determination of TM in bulk powder and pharmaceutical dosage form.
Keywords: Stability-indicating method; Micellar liquid chromatographic method; Timolol maleate; Degradation products.

1175. Comparative Study of Different Chromatographic Techniques for the Analysis of Multi-Residues of Some Approved Antimicrobials in Fish Tissues

Safa'a M. Riad, Mamdouh R. Rezk, Fatma I. Khattab and Hoda M. Marzouk

Two chromatographic methods were developed, optimized and validated for the simultaneous determination of three approved aquaculture antimicrobials, namely sulphadimethoxine sodium, trimethoprim and florphenicol in fish tissues. The developed methods were based on simple liquid extraction technique. The first method employs thin-layer chromatography as a clean-up procedure coupled with densitometric determination for the separated drugs. The second method is an HPLC one using X-Terra™ C18 column. Several mobile-phase systems and extracting solvents were tried to optimize the separation and the extraction procedures from fish tissues. The procedures were applied for the analysis of spiked fish tissue samples at three different concentration levels (10, 50 and 100 ppm). A comparative study was conducted between the proposed methods to discuss the advantage of each one. The methods were validated according to the international conference on harmonization guidelines. The proposed methods were successfully applied for the determination of the studied drugs in spiked fish tissues, pure powders and in their veterinary pharmaceutical formulation.
Keywords: Aquaculture antimicrobials; Densitometry; Fish tissues; HPLC; Sample clean up.

1176. Selective Determination of Diclazuril in the Presence of its Degradation Products

Mamdouh R. Rezk

A simple stability-indicating high-performance liquid chromatographic method was developed and validated for the

determination of diclazuril (DIC) in the presence of its induced degradation products. The drug was subjected to stress stability study including acidic, alkaline, photolytic, thermal and oxidative stress conditions, and the stressed samples were analyzed by the proposed method. The developed method utilized a C_{18} column (250 3 4.6 mm, i.d., 5 mm) in an isocratic separation mode with mobile phase consisting of acetonitrile and 0.2% phosphoric acid at a flow rate of 1.2 mL/min with UV detection at 275 nm. The proposed method was validated according to the International Conference on Harmonization guidelines. The method was applied in short term and accelerated stability studies for determination of the DIC in bulk powder and in its pharmaceutical formulation.
Keywords: Diclazuril; HPLC; Stability.

1177. Simultaneous Determination of Hydrochlorothiazide and Benazepril Hydrochloride or Amiloride Hydrochloride in Presence of Hydrochlorothiazide Impurities: Chlorothiazide and Salamide by HPTLC Method

Ibrahim A. Naguib, Eglal A. Abdelaleem, Hala E. Zaazaa and Mohammed E. Draz

Simple, selective and sensitive high-performance thin layer chromatographic (HPTLC) method has been developed and validated for the simultaneous determination of hydrochlorothiazide (HCZ) in the presence of its impurities (chlorothiazide (CT) and salamide (DSA)), in two quaternary mixtures with benazepril hydrochloride (BZ) or amiloride hydrochloride (AM). The separation was carried out on HPTLC silica gel 60 F254 using ethyl acetate–methanol–glacial acetic acid (85:2:0.3 v/v/v) followed by densitometric measurement of bands at 240 nm for the first mixture containing HCZ, CT, DSA, BZ and by using ethyl acetate–methanol–water–ammonia (90:10:5:3 v/v/v) followed by densitometric measurement at 278 nm for the second mixture containing HCZ, CT, DSA, AM. Calibration curves were constructed in the range of (0.2–1.8 mg/band) and (0.4–2.2 mg/band) with good accuracy for HCZ and BZ, respectively, for the first mixture and in the range of (0.6–1.8 mg/band) and (0.4– 2.4 mg/band) with good accuracy for HCZ and AM, respectively, for the second mixture. The developed method was validated according to ICH guidelines and demonstrated good accuracy and precision. Moreover, the methods were successfully applied for the determination of HCZ and BZ and AM in pure form and pharmaceutical dosage forms. The results were statically compared with the reported methods with no significant difference, indicating the ability of the proposed method to be used for routine analysis of drug product.
Keywords: Hydrochlorothiazide; Benazepril hydrochloride; Amiloride hydrochloride; HPTLC.

1178. HPTLC Method for Quantitative Determination of Zopiclone and its Impurity

Ibrahim A. Naguib, Maha M. Abdelrahman, Mohamed R. El Ghobashy and Nesma A. Ali

This study was designed to establish, optimize and validate a sensitive,selective and accurate high performance thin layer chromatographic(HPTLC) method for determination of zopiclone (ZPC) and its main impurity, 2-amino-5-chloropyridine, one of its degradation products, in raw material and pharmaceutical formulation. The proposed method was applied for analysis of ZPC and its impurity over the concentration range of 0.3–1.4 and 0.05–0.8 mg/band with accuracy of mean percentage recovery 99.92%+1.521 and 99.28%+2.296, respectively. The method is based on the separation of two components followed by densitometric measurement of the separated peaks at 305 nm. The separation was carried out on silica gel HPTLC F254 plates, using chloroform–methanol–glacial acetic acid (9:1:0.1 by volume) as a developing system. The suggested method was validated according to International Conference on Harmonization guidelines and can be applied for routine analysis in quality control laboratories.The results obtained by the proposed method were statistically compared with the reported method revealing high accuracy and good precision.
Keywords: Zopiclone; 2-Amino -5- Chloropyridine; HPTLC; Validation; Impurities.

1179. Validated Stability-Indicating Spectrophotometric Methods for the Determination of Cefixime Trihydrate in the Presence of its Acid and Alkali Degradation Products

Nadia M. Mostafa, Laila Abd El-Fattah, Soheir A. Weshahy, Al-Tagamoe Alkhames, Nagiba Y. Hassan and Shereen A. Boltia

Five simple, accurate, precise, and economical spectrophotometric methods have been developed for the determination of cefixime trihydrate (CFX) in the presence of its acid and alkali degradation products without prior separation. In the first method, second derivative (2D) and first derivative (1D) spectrophotometry was applied to the absorption spectra of CFX and its acid (2D) or alkali (1D) degradation products by measuring the amplitude at 289 and 308 nm, respectively. The second method was a first derivative (1DD) ratio spectrophotometric method where the peak amplitudes were measured at 311 nm in presence of the acid degradation product, and 273 and 306 nm in presence of its alkali degradation product. The third method was ratio subtraction spectrophotometry where the drug is determined at 286 nm in laboratory-prepared mixtures of CFX and its acid or alkali degradation product. The fourth method was based on dual wavelength analysis; two wavelengths were selected at which the absorbances of one component were the same, so wavelengths 209 and 252 nm were used to determine CFX in presence of its acid degradation product and 310 and 321 nm in presence of its alkali degradation product. The fifth method was bivariate spectrophotometric calibration based on four linear regression equations obtained at the wavelengths 231 and 290 nm, and 231 and 285 nm for the binary mixture of CFX with either its acid or alkali degradation product, respectively. The developed methods were successfully applied to the analysis of CFX in laboratory-prepared mixtures and pharmaceutical formulations with good recoveries, and their validation was carried out following the International Conference on Harmonization guidelines. The results obtained were statistically compared with each other and showed no significant difference with respect to accuracy and precision.

Keywords: Alkali degradation product; Cefixime trihydrate; Acid degradation.

1180. Stability-indicating Spectrofluorometric Method for the Determination of Some Cephalosporin Drugs Via their Degradation Products

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A stability-indicating spectrofluorometric method was investigated for the determination of three cephalosporin drugs, namely, cefpodoxime proxetil (CPD), cefixime trihydrate (CFX), and cefepime hydrochloride (CPM), via their acid and alkali degradation products. The three drugs were determined via their acid degradation at 432, 422, and 435 nm using an excitation wavelength of 310, 330, and 307 nm for CPD, CFX, and CPM determination, respectively, and via their alkali degradation at 407, 411, and 405 nm using an excitation wavelength of 310, 305, and 297 nm for CPD, CFX, and CPM determination, respectively. Linearity was achieved in the ranges of 0.35–3.50, 0.4–4.0, and 0.3–3.0 µg/mL for the acid degradation products of CPD, CFX, and CPM, respectively, and in ranges of 0.05–0.5, 0.1–1.0, and 0.08–0.80 µg/mL for the alkali degradation products of CPD, CFX, and CPM, respectively. The method was validated for various parameters according to International Conference on Harmonization guidelines. The method was successfully applied for the determination of these cephalosporin drugs in pharmaceutical dosage forms with good accuracy and precision. The results obtained by the proposed spectrofluorometric method were compared with good agreement to the official HPLC method.

Keywords: Cephalosporin; Spectrofluorometry; Degradation; Cefpodoxime; Cefixime; Cefepime.

1181. Micellar Enhanced Spectrofluorimetric Method for the Determination of Ponatinib in Human Plasma and Urine Via Cremophor RH 40 as Sensing Agent

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International Journal of Analytical Chemistry, (2015) IF: 1.0

An impressively simple and precise spectrofluorimetric procedure was established and validated for ponatinib (PTB) quantitation in biological fluids such as human plasma and human urine. This method depends on examining the fluorescence characteristics of PTB in a micellar system of Cremophor RH 40 (Cr RH 40). Cr RH 40 enhanced the intrinsic fluorescence of PTB distinctly in aqueous water. The fluorescence spectra of PTB was recorded at 457 nm following its excitation at 305 nm. Maximum fluorescence intensity was attained by addition of 0.7 mL of Cr RH 40 and one mL of phosphate buffer to PTB aliquots and then dilution with distilled water. There is a linear relationship between the fluorescence intensity of PTB and its concentration over the range 5– 120 ngmL^{-1}, with limit of detection and limit of quantification equal to 0.905 ngmL^{-1} and 2.742 ngmL^{-1}, respectively. The accuracy and the precisions of the proposed method were checked and gave adequate results. The adopted method was applied with a great success for PTB quantitation in different biological matrices (spiked human plasma and urine) giving high recovery values.

Keywords: Plasma; Micellar; Ponatinib.

1182. Determination of Cefoperazone Sodium in Presence of Related Impurities by Linear Support Vector Regression and Partial Least Squares Chemometric Models

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Journal of Analytical Methods in Chemistry, (2015) IF: 0.792

A comparison between partial least squares regression and support vector regression chemometric models is introduced in this study. The two models are implemented to analyze cefoperazone sodium in presence of its reported impurities, 7-aminocephalosporanic acid and 5-mercapto-1-methyl-tetrazole, in pure powders and in pharmaceutical formulations through processing UV spectroscopic data. For best results, a 3-factor 4-level experimental design was used, resulting in a training set of 16 mixtures containing different ratios of interfering moieties. For method validation, an independent test set consisting of 9 mixtures was used to test predictive ability of established models.The introduced results show the capability of the two proposed models to analyze cefoperazone in presence of its impurities 7-aminocephalosporanic acid and 5-mercapto-1-methyl-tetrazole with high trueness and selectivity (101.87 $\pm$ 0.708 and 101.43 $\pm$ 0.536 for PLSR and linear SVR, resp.). Analysis results of drug products were statistically compared to a reported HPLC method showing no significant difference in trueness and precision, indicating the capability of the suggested multivariate calibration models to be reliable and adequate for routine quality control analysis of drug product. SVR offers more accurate results with lower prediction error compared to PLSR model; however, PLSR is easy to handle and fast to optimize.

Keywords: Cefoperazone sodium; Linear support vector regression; Partial least squares.

1183. Development and Validation of Chromatographic Methods for Simultaneous Determination of Ibuprofen and Famotidine in Presence of Related Substances in Pharmaceutical for mulations

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Two validated methods for the simultaneous determination of ibuprofen and famotidine in the presence of ibuprofen impurity (4-isobutylacetophenone) and/or famotidine degradation products were described. The first method was a simple TLC method where separation was performed on silica gel plates using ethyl acetate: methanol: ammonia (9:2:1, by volume) as a mobile phase. Rf values were found to be 0.40, 0.94, 0.66, 0.27, 0.83 for ibuprofen, 4-isobutylacetophenone, famotidine, famotidine acid

and basic degradation products, respectively. The second method was HPLC on C18 column using methanol: phosphate buffer pH 3 (80:20, v/v) as a mobile phase. Retention times were found to be 2.2 min, 9.9 min, and 8.6 min for famotidine, ibuprofen, and 4-isobutylacetophenone, respectively. Both methods were validated according to the ICH guidelines and applied for the determination of the two drugs in pure powder and combined dosage form without interference from the excipients.

Keywords: Ibuprofen; Famotidine; Degradation products and impurities; TLC-Densitometry and HPLC.

1184. Design, Optimization, and Validation of Thin-Layer Chromatography–densitometry and Chemometry-Assisted Spectrophotometry: A Comparative Study Applied on Quaternary Mixture

Hesham Salem, Nagiba Y. Hassan, Hayam M. Lotfy and Sarah S. Saleh

This work presents a comparative study on the development and validation of two analytical techniques applied for the simultaneous determination of hydrocortisone acetate (HCA), fusidic acid (FSA), methyl paraben (MPB), and propyl paraben (PPB) formulated as a topical cream. The first technique was thin-layer chromatography (TLC)–densitometric method, which was developed by separating the four components on silica gel 60 F254 using methylene chloride–methanol–benzene in the ratio of 10:2:5, v/v, as the developing system, followed by densitometric measurement of the bands at 240 nm. The second technique was the chemometric method using two models: principle component regression model (PCR) and partial least squares (PLS). The suggested techniques were validated in compliance with the International Conference on Harmonization (ICH) guidelines and were successfully applied for the determination of the quaternary mixtures as prepared synthetically in laboratory and in the commercial topical pharmaceutical formulation

Keywords: Hydrocortisone fusidic acid; Parabens; Thin-layer Chromatography–densitometry; Partial least squares.

1185. RP-HPLC with Time Programmed Fluorescence Detection for Quantitation of Avanafil and Dapoxetine Hydrochloride; Application to Pharmaceutical Dosage Form and Biological Fluid

M. Hegazy, A. Kessib, M. Abdelkawy and A. E. El-Gindy

Avanafil (AVN) was recently co-formulated with dapoxetine HCl (DAP) for treatment of erectile dysfunction and premature ejaculation. Sensitive and simple reversed-phase (RP) high-performance liquid chromatographic method (HPLC) was developed and validated for their simultaneous determination using tadalafil (TAD) as an internal standard. Isocratic separation was achieved within run time of only 7.0 min on Eclipse C_{18} column (150 mm × 4.6 mm, 5 µm particle size) using a mobile phase composed of acetonitrile: 0.15% triethylamine (40:60, v/v) at pH = 4.0 adjusted with o-phosphoric acid. The analysis was performed at a flow rate of 1.0 mL/min with fluorescence detection at 236/370 nm for AVN, 236/410 nm for DAP, and

236/330 for TAD using time programming. The analytes were determined by their native fluorescence and the response was linear over concentration ranges of 0.05–40 and 0.01–30 µg/mL for AVN and DAP, respectively, with limits of detection of 0.043 and 0.007 µg/mL in a respective order. The developed method successfully determined AVN and DAP in bulk powder, tablets, and spiked human plasma.

Keywords: Avanafil; Dapoxetine; Fluorescence detection; HPLC; Spiked human plasma; Tadalafil.

1186. Novel Ratio Subtraction and Isoabsorptive Point Methods for Determination of Ambroxol Hydrochloride and Doxycycline in their Combined Dosage Form: Development and Validation

Hany W. Darwish, Fadia H. Metwally and Abd El-Aziz El-Bayoumi

Purpose: To develop and validate two innovative spectrophotometric methods used for the simultaneous determination of ambroxol hydrochloride and doxycycline in their binary mixture.

Methods: Ratio subtraction and isoabsorptive point methods were used for the simultaneous determination of ambroxol hydrochloride and doxycycline in their binary mixture. Linear correlations were obtained in the concentration range of 6 - 40 and 4 - 32 µg mL-1 for ambroxol hydrochloride and doxycycline, respectively. Ratio subtraction method was utilized for determination of ambroxol hydrochloride at 246.5 nm while isoabsorptive point method was employed for doxycycline at 244 nm (using methanol as a solvent) in mixtures as well as in their combined dosage form (Ambrodoxy capsules).

Results: The proposed methods were successfully applied to the analysis of the pharmaceutical capsules containing the two analytes. Recovery for ambroxol hydrochloride and doxycycline in capsules was 99.49 and 99.96 %, respectively. The relative standard deviation (% RSD) for the assay of the capsules was < 1 %. Validation of the two methods was assessed according to International Council on Harmonization (ICH) guidelines regarding linearity, accuracy, precision, specificity and range. The results of the proposed methods compared favorably with those obtained by a reported chemometricsassisted ultraviolet (UV)-spectroscopic method.

Conclusion: The proposed methods are rapid, selective, simple and accurate. They also represent suitable alternatives to the chromatographic methods currently used for the analysis of the pharmaceutical mixtures in various dosage forms.

Keywords: Ambroxol; Doxycycline; Ratio subtraction method; Isoabsorptive point Method; Binary mixture; Spectrophotometry.

1187. Development of three Methods for Simultaneous Quantitative Determination of Chlorpheniramine Maleate and Dexamethasone in the Presence of Parabens in Oral Liquids

Hany W. Darwish, Fadia H. Metwally and Abd El-Aziz El-Bayoumi

Medicine Sector

Purpose: To develop new selective, precise, and accurate methods for the simultaneous determination of chlorpheniramine maleate (CHP) and dexamethasone (DX) in the presence of methyl and propyl paraben in phenadone syrup.

Methods: In the first two methods, the predictive abilities of principal component regression (PCR) and partial least squares (PLS), respectively, were examined for the analysis of the quaternary mixture. The third method, high performance thin layer chromatography (HPTLC)-densitometric method, was based on the separation of the mixture on silica gel plates using chloroform: methanol (93:7, v/v) as a mobile phase.

Results: All the proposed methods were successfully applied to the analysis of raw materials and dosage form. For PCR method, recovery of chlorpheniramine maleate and dexamethasone in the dosage form was 98.89 ± 1.736 and 102.36 ± 1.86 %, respectively while for. PLS method, recovery of chlorpheniramine maleate and dexamethasone was 98.94 ± 1.69 and 102.33 ± 1.84, respectively. On the other hand, recovery of the two analytes by HPTLC method was 100.72 ± 1.05 and 102.29 ± 3.98, respectively. The results obtained by applying the proposed methods were statistically analyzed and compared with those obtained by a reported HPLC method.

Conclusion: The proposed methods are fast, accurate and specific, and can be applied for the quantitative determination of the two analytes without interference from added excipient, thus obviating the need for preliminary extraction of analytes from the pharmaceutical formulation. Thus, they are suitable for use in quality control (QC) laboratories and pharmaceutical industry.

Keywords: Chlorpheniramine maleate; Dexamethasone; Principal component regression; Partial least squares; High performance Thin layer Chromatography; Excipients.

1188. Discrete Wavelet Transform-Partial Least Squares Versus Derivative Ratio Spectrophotometry for Simultaneous Determination of Chlorpheniramine Maleate and Dexamethasone in the Presence of Parabens in Pharmaceutical Dosage Form

Hany W. Darwish, Fadia H. Metwally and Abd El-Aziz El-Bayoumi

Purpose: To compare two methods, based on different approaches, for simultaneous determination of chlorpheniramine maleate (CHP) and dexamethasone (DX) in the presence of methyl and propyl paraben in phenadone syrup.

Methods: The first method used, based on univariate calibration approach, was first derivative of the ratio spectrophotometry (DD1). The second method, which is a multivariate calibration approach, was discrete wavelet transform followed by partial least squares method (DWT-PLS) which anticipated high predictive ability for the determination of both CHP and DX.

Results: DD1 method failed to determine DX due to the absence of adequate zero crossing point while DWT-PLS method was successfully applied for the analysis of raw materials and the dosage form. For DD1 method, recovery of chlorpheniramine maleate in the dosage form was 100.33 ± 0.91 % while for DWT-PLS method, recovery of chlorpheniramine maleate and dexamethasone was 100.24 ± 1.21 and 99.99 ± 1.08 %, respectively. The proposed methods were validated using

standard addition technique and the results compared favorably with those obtained by a reference high performance liquid chromatography (HPLC) method.

Conclusion: The findings of this work show the superiority of DWT-PLS over DD1 method in solving such complex mixtures, and would thus be suitable for use in quality control (QC) laboratories and pharmaceutical industry

Keywords: Quantitative analysis; Discrete wavelet transform; First derivative of ratio spectra; Chlorpheniramine maleate; Dexamethasone.

1189. Resolution of Overlapped Quaternary Spectral Bands by Net Analyte Signal Based Methods; An Application to Different Combinations in Tablets and Capsules

Maha Abd El-Monem Hegazy, Samah Sayed Abbas and Hala El-Sayed Zaazaa

Net analyte signal (NAS) based methods (NBMs); namely NAS preprocessing (NAP) and hybrid linear analysis (HLA) were applied as multivariate calibration methods for resolving quaternary spectrally overlapped bands of Chlorzoxazone (CXZ), Paracetamol (PAR), Ibuprofen (IBU) and Ketoprofen (KTO) which are commonly coformulated. The calibration set was composed of 17 mixtures within the concentra tions ranges of 8.80–13.20, 10.56–15.84, 7.04–10.56 and 1.76–2.64 µg/mL for CXZ, PAR, IBU and KTO, respectively. A wavelength selection procedure was presented for the introduced NBMs. Figures of merit as limit of detection, selectivity and analytical sensitivity were also calculated based on the NAS concept. The developed NBMs models used smaller number of wavelengths as well as smaller number of latent variables which make NAP and HLA models more simple and interpretable than the conventional partial least squares (PLS). The models were successfully applied to tablets and capsules, and ANOVA was applied in comparison with an HPLC method.

Keywords: Net analyte signal; Hybrid linear analysis; Chlorzoxazone; Paracetamol; Ibuprofen; Ketoprofen.

1190. Simultaneous Determination of Levodropropizine, Methylparaben, and Propylparaben in Oral Co-formulated Syrup by RP-HPLC Method

Soheir Abd El-Fatah Weshahy, Maissa Salem Yaaqob, Marianne Nebsen Morcos, Dina Wahba Hassan and Nadia Fayek Youssef

A selective, rapid, isocratic RP-HPLC method has been developed and validated for the simultaneous determination of the cough suppressant drug levodropropizine and its two co-formulated preservatives methylparaben and propylparaben in Levopront® syrups. The chromatographic separation was achieved on Inertsil® C18, (250 mm x 4.6mm, 5um) column using a mixture of (acetonitrile: 0.1 % triethylamine in water, pH 3.0) 50:50: (v/v), as a mobile phase with a flow rate of 1.0 ml/min, at 30° C column temperature and detector wavelength of 240 nm. All peaks were symmetrical and well resolved in a short run time. Method validation demonstrated to be selective,

accurate and precise with good linearity over the concentration range of (7.5-60 µg/ml), (1.625-13 µg/ml), and (0.25-2 µg/ ml) with limits of detection and quantification of 0.502 and 1.520 µg/ml, 0.071 and 0.215 µg/ml, and 0.040 and 0.122 µg/ml for Levodropropizine, Methylparaben, and Propylparaben, respectively. Robustness against small modifications of column temperature, flow rate and pH of the mobile phase was ascertained. The developed method was successfully applied for the separation and quantification of Levodropropizine in presence of its two co-formulated preservatives in drug substances and in Levopront® oral pharmaceutical formulation; therefore it's highly suitable for routine analysis in QC labs.

Keywords: Levodropropizine; Methylparaben; Propylparaben; RP-HPLC; Method validation.

1191. Selective Determination of Itraconazole in the Presence of its Oxidative Degradation Product by A New Spectrophotometric Method

Nesrine T. Lamie

A simple, specific, accurate and precise spectrophotometric stability indicating method is developed for determination of itraconazole in the presence of its oxidative degradation product and in pharmaceutical formulations. A newly developed spectrophotometric method called ratio difference method by measuring the difference in amplitudes between 230 and 265 nm of ratio spectra. The calibration curve is linear over the concentration range of 5-25 µg/ml with mean percentage recovery of 99.81±1.002. Selective quantification of itraconazole, singly in bulk form, pharmaceutical formulations and in the presence of its oxidative degradation product is demonstrated. The results have been statistically compared with a pharmacopeial method.

Keywords: Itraconazole; Stability indicating; Ratio difference; Spectrophotometry.

1192. Spectrophotometeric Methods for Simultaneous Determination of Amlodipine Besylate and Atenolol in their Tablet Dosage Form

Nesrine T. Lamie

Three simple, specific, accurate and precise spectrophotometric methods are developed for simultaneous determination of amlodipine besylate (AM) and atenolol (AT) in tablets. The first method is dual wavelength spectrophotometry (DW). The second method is ratio subtraction (RS) which depends on subtraction of the plateau values from the ratio spectrum, coupled to first derivative of ratio spectra (1DD). The third method applies bivariate calibration method using 210 and 225 nm as an optimum pair of wavelength for amlodipine and atenolol. The calibration curves are linear over the concentration range of 4–40 µg/ml for both drugs. The specificity of the developed methods is investigated by analyzing laboratory prepared mixtures of the two drugs and their combined dosage form. The two methods are validated as per ICH guidelines and can be applied for routine quality control testing.

Keywords: Amlodipine; Atenolol; Ratio subtraction; Dual wavelength; Derivative-ratio; Bivariate; Spectrophotometry.

1193. Application of A New Spectrophotometric Method Manipulating Ratio Spectra for Determination of Bambuterol Hydrochloride in the Presence of its Degradation Product Terbutaline

Nesrine T. Lamie

A simple, specific, accurate and precise spectrophotometric stability indicating method is developed for determination of bambuterol hydrochloride (BH) in the presence of its degradation product terbutaline (TERB) and in pharmaceutical formulations. A newly developed spectrophotometric method called ratio difference method by measuring the difference in amplitudes between 245 and 260 nm of ratio spectra. The calibration curves are linear over the concentration range of 0.1-1 mg/ml^{-1} for BH and 0.1-0.7 mg/ml^{-1} for TERB with mean percentage recovery of 100.56±0.751 and 99.88±1.183, respectively. The selectivity of the proposed method is checked using laboratory prepared mixtures. The proposed method has been successfully applied to the analysis of BH in pharmaceutical dosage forms without interference from other dosage form additives and the results have been statistically compared with pharmacopeial method.

Keywords: Bambuterol hydrochloride; Terbutaline; Stability indicating; Ratio difference; Spectrophotometry.

1194. A Novel Sensor for Determination of Dexamethasone Disodium Phosphate in Different Pharmaceutical for mulations

Mohamed K. Abd El-Rahman, Hayam M. Lotfy, Maha A. Hegazy, Mamdouh R. Rezk and Yasmin Rostom Omran

A novel electrode was developed for potentiometric determination of dexamethasone sodium phosphate (DSP) using tetraheptyl ammonium bromide (THB) as an anionic exchanger in polyvinyl chloride (PVC) matrix and 2-nitrophenyl octyl ether (2-NPOE) as a plasticizer. Linear responses of $1×10-5$ to $1×10-2$ M with slope of -26.50±0.39 mV/decade within working pH range 8-12 were achieved. The percentage recovery of determination of DSP by the proposed DSP selective electrode was 99.96±0.95. Determination of DSP in its pharmaceutical formulations by the proposed electrode revealed its applicability for determination. Moreover, the electrode exhibits good selectivity for DSP with respect to a large number of interfering substances and co-formulated drugs. The fabricated sensor was validated according to ICH guidelines and successfully applied for determination of the studied drug in pure form and pharmaceutical formulations without any interference from additives either labeled or non-labeled. The obtained results have been statistically compared to that of an official spectrophotometric method to give a conclusion that there is no significant difference between the proposed methods and the official one with respect to accuracy and precision.

Keywords: Dexamethasone sodium phosphate; 2-Nitrophenyl octyl ether; Potentiometry; Polyvinyl chloride; Tetraheptyl ammonium bromide.

Medicine Sector

1195. Development of Membrane Electrode for the Selective Determination of Bromazepam in Tablets and Plasma

Nesma A. Ali, Maha M. Abd El-Rahman, Ibrahim A. Naguib and Mohamed R. El-Ghobashy

Polyvinyl chloride (PVC) membrane sensor is described and characterized for the determination of a Benzodiazepine drug; bromazepam (BMZ). The sensor based on the use of the ion association complex of BMZ cation with tetraphenyl borate (BMZ-TPB) counter anion as ion exchange sites in the PVC matrix plasticized with dibutylsebathete (DBS) as a solvent mediator. The performance characteristics of this sensor were evaluated according to IUPAC recommendations; achieve a fast, stable and linear response for BMZ over the concentration range 10^{-6} to 10^{-2} M with slope of 44.13 mV per concentration decade. The direct potentiometric determination of BMZ using the proposed sensor gave average recovery of 100.05±0.66. The sensor is used for determination of BMZ in pharmaceutical formulations and in plasma. Validation of the method shows suitability of the proposed sensor for use in the quality control assessment of BMZ. The developed method was proved to be simple, accurate and precise when statistically compared with a reference HPLC method.
Keywords: Bromazepam; Ion selective electrode; PVC membrane; Tetraphenyl borate.

1196. Development of Membrane Electrodes for the Specific Determination of Tetryzoline Hydrochloride in Presence of its Degradation Product in Pharmaceutical for Mulations and Biological Fluids

Nagiba Y. Hassan,Hayam M. Lotfy, Sarah S. Saleh and Hesham Salem

Membrane selective electrodes were used to determine tetryzoline hydrochloride (TZH) in pure form, pharmaceutical preparations and in biological fluids. The membrane selective electrodes include construction of water insoluble ion-association complexes. The TZH ion exchangers were formed using tetraphenyl borate (TZH-TPB), phosphomolybdic acid (TZH-PMA) and phosphotungstic acid (TZH-PTA), in a plasticized PVC (polyvinyl chloride) matrix, using dibutyl phthalate (DBP) or dioctylphthalate (DOP) as a plasticizer. The performance characteristics of the developed sensors were evaluated according to IUPAC recommendations. The developed sensors showed good responses but the best electrochemical characteristics and selectivity coefficients were achieved with TZH-TPB sensor using DBP as a plasticizer, where the linear responses of TZH was found within the concentration ranges of 10^{-6} to 10^{-2} mol/L and Nernstian slope was calculated to be of 56.8 mV/ decade at 25 °C, over the pH range of 5–9. The suggested method was used to determine TZH in synthetic mixtures, pharmaceutical formulations and in presence of its alkali degradation product. The proposed sensors displayed useful analytical characteristics for the determination of TZH in biological fluids such as rabbit aqueous humor and human plasma. The later application can be used to detect oral TZH poisoning in children.

Keywords: Tetryzoline; Aqueous humor; Human plasma; Degradation product.

1197. Simultaneous Determination of Carbinoxamine, Pholcodine, and Ephedrine in Antitussive Preparation by High-performance Liquid Chromatography and Thin-layer Chromatography–densitometry

Azza Aziz Moustafa, Hesham Salem, Maha Hegazy and Omnia A. Mahmoud

Simple, accurate, precise, sensitive, and validated high-performance liquid chromatography (HPLC) and thin-layer chromatography (TLC)–densitometric methods were developed for the simultaneous determination of carbinoxamine (CAR), pholcodine (PHL), and ephedrine (EPH) in antitussive syrup. In method A, reversed-phase (RP)-HPLC analysis was performed on an Inertsil CN-3 column (250 mm × 4.6 mm, 5 µm), using a mobile phase consisting of acetonitrile–distilled water (pH 3.5) using orthophosphoric acid in the ratio 70:30 (v/v) and flow rate of 1.5 mL min . Quantitation was achieved with ultraviolet (UV) detection at 220 nm. In method B, TLC analysis was carried out on an aluminum-backed sheet of silica gel 60 F -1 layer using chloroform– propanol–ammonia (6:4:0.1, v/v) as the mobile. Quantification was carried out with UV detection at 245 nm. The validation of the proposed methods was applied according to the International Conference on Harmonization (ICH) guidelines. The suggested methods were successfully applied for the determination of the cited drugs in bulk powder and commercial dosage form. 254.
Keywords: Carbinoxamine; Pholcodine; Ephedrine; Reversed-phase high-performance liquid chromatography; Thin-layer chromatography–densitometry.

1198. Comparative Study of Reversed-phase High-performance Liquid Chromatography Versus Thin-Layer Chromatography-densitometry for Determination of Citicoline Sodium in Presence of its Alkaline Degradation Products

Omnia A. Mahmoud, Maha A. Hegazy, Hesham Salem and Azza A. Moustafa

Simple, sensitive, selective, and precise stability-indicating thin-layer chromatography (TLC)–densitometric and reversed-phase high-performance liquid chromatography (RP-HPLC) methods were developed and validated for the determination of citicoline sodium (CT) in the presence of its alkaline degradation products (CT Deg.) and in pharmaceutical oral solution. TLC–densitometry employs aluminum TLC plates precoated with silica gel 60 F as the stationary phase and ammonia–ethyl acetate–triethylamine (6:3.5:0.5, v/v) as the mobile phase to give compact spots for citicoline sodium (R F = 0.35) and its degradation product (R = 0.1); the chromatogram was scanned at 272 nm. RP-HPLC utilizes a C18 column and a mobile phase consisting of methanol–water–acetic acid (60:40:0.1, v/v); the pH level was adjusted to 4 using 0.1% orthophosphoric acid, at a flow rate of 1

mL min for the separation of citicoline sodium (t R -1 = 1.801) and its degradation product (t = 3.422). Quantitation was achieved by ultraviolet (UV) detection at 272 nm. Citicoline sodium was exposed to alkaline hydrolysis, and a comparative study was carried out to show the advantages of the proposed chromatographic methods in determination of citicoline sodium in the presence of its alkaline degradation products. The chromatographic methods were developed and validated as per the International Conference on Harmonization guidelines. As the methods could effectively separate the drug from their degradation products, these techniques can be employed as stability-indicating methods that have been successively applied to pharmaceutical formulations without interference from the excipients. R F 254.

Keywords: Citicoline; Degradation products; Thin-layer chromatography–densitometry; Reversed-phase high-performance liquid chromatography.

1199. A Novel Liquid Chromatographic Method with Fluorescence Detection for Quantitation of Tadalafil and Dapoxetine Hydrochloride in Pharmaceutical Dosage Form and Human Plasma

Maha Hegazy, Amira Kessiba, Mohamed Abdelkawy and Ahmed Emad El-Gindy

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Tadalafil (TAD) and dapoxetine HCl (DAP) are recently co-formulated and both show native fluo-rescence. Therefore, a novel, accurate, specific and sensitive reversed-phase high performance liquid chroma-tographic method with fluorescence detection was developed and validated for their separation and quantitation in dosage form and human plasma using avanafil as an internal standard (IS) . Separation was achieved using isocratic elution within 7,0 min on C_{18} column and acetonitrile-0. 15% triethylamine (40: 60, v /v; pH 4) as a mobile phase. The flow rate was 1,0 mL / min and the detection was time-programmed at 330, 410 and 370 nm for TAD, DAP and IS, respectively, after excitation at 236 nm. The linear ranges from 0,01 to 30,00 µg / mL for each drug with the limits of detection of 4, 20 and 7, 20 ng / mL for TAD and DAP, respectively. The method was validated in accordance to the International Conference on Harmonization (ICH) guidelines and was successful-ly applied to spiked human plasma with mean recoveries of 98. 17% and 98. 83% for TAD and DAP respectively. Key words: high performance liquid chromatography (HPLC); fluorescence detection; tadalafil (TAD); dapoxetine HCl (DAP); dosage form; human plasma.

Keywords: High performance liquid chromatography (HPLC); Fluorescence detection; Tadalafil (TAD); Dapoxetine HCL (DAP); Dosage form; Human plasma.

1200. Univariate Spectrophotometry and Multivariate Calibration: Stability-Indicating Analytical Tools for the Quantification of Pimozide in Bulk and Pharmaceutical Dosage Form

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Simple, accurate sensitive and precise spectrophotometric and chemometric stability indicating techniques were adopted for the determination of Pimozide (PIM) in presence of its alkaline and acidic degradation products over a concentration range of 10–100 µg mL-1. The proposed spectrophotometric technique includes first derivative (D1) spectrophotometric one at 252 nm and 256.6 nm in presence of its acidic and alkaline degradates, respectively, first-derivative of the ratio spectra spectrophotometry (DR1) at 292.5 nm, the Q-analysis (absorption ratio) method, which involves the formation of absorbance equation at 242.2 nm and 281.7 nm, dual wave length method at 270.1 nm and 284 nm, the H-point standard addition method (HPSAM) and the mean centering of the ratio spectra method. The second technique is chemometric methods which include determination of PIM in presence of both its acidic and alkaline degradates using multivariate calibration methods [the classical least squares (CLS), principle component regression (PCR) and partial least squares (PLS)] using the information contained in the absorption spectra. The proposed methods have been successfully applied to the analysis of PIM in pharmaceutical dosage forms without interference from other dosage form additives and the results were statistically compared with the official method

Keywords: Pimozide; Stability; Spectrophotometry; Chemometric methods.

1201. Stability-Indicating Methods for the Determination of Gemifloxacin in Presence of its Acid Degradation Product (S)

Ezzat M. Abdel-Moety, Amr M. Badawey, Hebatallah M. Essam and Fatma M. Aboul Alamine

International Journal of Drug Development and Research, 7(2): 1-8 (2015)

Brilliant, valid and simple five UV spectrophotometric stability indicating techniques are adopted for the determination of Gemifloxacin (GEM) in presence of its acid degradation products over a concentration range of 2-12 µg mL^{-1}. The first method is an application of the first derivative (^{1}D) spectrophotometry, that allows the determination of GEM without interference of its acid degradation products at zero crossing wavelength (254.6 nm). The second method depends on the first-derivative of the ratio spectra spectrophotometry (^{1}DD) for determination of GEM in presence of its acid degradation products at a maximum of 273.0 nm and a minimum of 284.0 nm, While the third dual wavelength method offers a superior stability indicating procedures for the determination of GEM in the zero order spectra at the wavelength pair of 271.8 nm and 325.0 nm. The fourth method is the ratio difference one, with the advantages of minimal data processing and wide range of application. It is applied for the analysis of intact drug in presence of its acid degradation products by measuring the difference in the peak amplitude at the ratio spectra at 355.0 nm and 270.0 nm. The last method is based on the quantification of GEM through the bivariate calibration at 255.0 nm and 277.0 nm by adopting simple mathematic algorithm that provides simplicity and rapidity.

Keywords: Gemifloxacin; First derivative; Derivative ratio; Dual wave length; Bivariate calibration; Ratio difference.

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1202. Ion Selective Membrane Electrodes for Determination of Cetrimide in Pure form and in Pharmaceutical for mulations

Eman S. Elzanfaly, Yasmine F. Bassuoni, Hebat Allah M. Essam and Hala E. Zaazaa

This paper presents a comparative study between five ion selective electrode sensors which were constructed and validated to determine Cetrimide (CET) by direct potentiometry in pure drug and its mouthwash without sample pre-treatment. Precipitation based technique was used for sensors fabrication. The CET complexes with different types of polyvinylchloride matrix and different cationic exchangers, CET- carboxylated polyvinylchloride (sensor 1), CET- tetrakis (sensor 2), CET-phosphotungestate (sensor 3), CET-tetraphenylborate (sensor 4) and CET- carboxylated polyvinylchloride / tetrakis (sensor 5) were obtained in situ by soaking the PVC membranes in 1×10^{-4} M CET solution. Nitrophenyl octyl ether (NOPE) was used as plasticizer. Proposed sensors showed fast, stable Nernstian responses across a relatively wide CET concentration range of 7.81×10^{-6} M to 1×10^{-3} M (for sensor 1, 2 and 5) and 3.13×10^{-5} M to 1×10^{-3} M (for sensor 3 and 4) in the pH range of 1-10 (for sensors 1, 2 and 5) and 5-7 (for sensors 3 and 4). Suggested sensors were found to be stable for several weeks without any measurable change in sensitivity. Validation of the method according to IUPAC recommendations showed suitability and selectivity of the proposed electrodes for the use in quality control assessment of CET in presence of different interferents. Proposed sensors were successfully applied for CET determination in pure form and in its mouthwash where good responses were obtained regarding accuracy and precision.

Keywords: Cetrimide, Carboxylated polyvinylchloride; Tetraphenylborate; Phosphotungestate; Tetrakis.

1203. Investigation of the Profile and Kinetics of Degradation of Rivaroxaban Using HPLC, TLC-Densitometry and LC/MS/MS: Application to Pre-Formulation Studies

Mohamed A. Abdallah, Medhat A. Al-Ghobashy and Hayam M. Lotfy

Rivaroxaban (RIVA), an amide group-containing oral anticoagulant was subjected to stress conditions commonly required for the registration of pharmaceuticals: base and acid-catalyzed hydrolysis (0.1 M, 60 °C, 3–6 h), oxidation (10% H2O2, 24 h), photodegradation (300–800 nm, 24 h) and thermal decomposition (50 °C, 6 h). Two major degradation products were separated and identified using TLC and LC/MS/MS, respectively. An orthogonal stability-indicating testing protocol (RP-HPLC and NP-TLC-densitometry) was developed and validated according to ICH guidelines. Both assays enabled the determination of RIVA in the presence of its degradation products as well as the kinetics of degradation. Determination was carried out over a concentration range of (5.00–50.00 µg/mL) and (0.40–12.00 µg/band) with an accuracy of (100.81% ± 1.03) and (100.29% ± 1.08) for HPLC and TLC-densitometry, respectively.

Results indicated that RIVA was stable towards oxidation, photodegradation and thermal decomposition but extremely sensitive to hydrolysis. Two major degradation products were detected in the case of base-catalyzed hydrolysis while only one degradation product was detected upon acid-catalyzed hydrolysis. This could be attributed to the presence of amide groups in RIVA structure of different stability profiles. The kinetics of hydrolysis was investigated in more detail and the reaction was found to follow the pseudo first order kinetics, as confirmed by the results of both HPLC and TLC-densitometric assays. The applicability of the assay for the determination of RIVA content and dissolution pattern of the innovator product as well as three generic formulations was demonstrated.

Keywords: LC-Msms; Acid-catalyzed degradation; Base-catalyzed degradation; Rivaroxaban.

1204. Ion Selective Membrane Electrodes for Determination of Citalopram Hydrobromide in Drug Product and in Presence of its Degradation Products

Marianne Nebsen, Christine M. El-Maraghy, Hesham Salem and Sawsan M. Amer

This paper presents a comparative study between three sensors developed to determine Citalopram Hydrobromide (CT) in the presence of its alkaline hydrolysis and oxidation induced degradation products using different ion association complexes. Sensor 1 was fabricated using phosphomolybdic acid, Sensor 2 used phosphotungestic acid and sensor 3 used the sodium tetraphenyl borate. Linear responses of CT were obtained within the concentration ranges of 1×10^{-6} to 1×10^{-2} mol L^{-1} for sensor 1 and 2 and 1×10^{-5} to 1×10^{-2} mol L^{-1} for sensor 3 over the pH range of 3.0–6.0. The selectivity coefficients of the developed sensors indicated excellent selectivity for CT. The proposed sensors displayed useful analytical characteristics for the determination of CT in bulk powder, pharmaceutical formulation, and in the presence of its degradation products and thus could be used for stability-indicating methods. The method was validated according to ICH guidelines. Statistical comparison between the results from the proposed method and the results from the reference HPLC method showed no significant difference regarding accuracy and precision.

Keywords: Citalopram hydrobromide; Ion selective electrode; Degradation products; Cation exchanger; PVC.

Dept. of Bio Chemsitry

1205. Role of the KATP Channel in the Protective Effect of Nicorandil on Cyclophosphamide-Induced Lung and Testicular Toxicity in Rats

Lamiaa A. Ahmed, Shohda A. El-Maraghy and Sherine M. Rizk

Role of the KATP channel in the protective effect of nicorandil on cyclophosphamide-induced lung and testicular toxicity in rats Lamiaa A. Ahmed1, Shohda A. EL-Maraghy2 and Sherine M. Rizk2 This study is the first to investigate the role of the KATP channel in the possible protection mediated by nicorandil against

cyclophosphamide-induced lung and testicular toxicity in rats. Animals received cyclophosphamide (150 mg/kg/day, i.p.) for 2 consecutive days and then were untreated for the following 5 days. Nicorandil (3 mg/kg/day, p.o.) was administered starting from the day of cyclophosphamide injection with or without glibenclamide (5 mg/kg/day, p.o.). Nicorandil administration significantly reduced the cyclophosphamide-induced deterioration of testicular function, as demonstrated by increases in the level of serum testosterone and the activities of the testicular 3β-hydroxysteroid, 17β-hydroxysteroid and sorbitol dehydrogenases. Furthermore, nicorandil significantly alleviated oxidative stress (as determined by lipid peroxides and reduced glutathione levels and total antioxidant capacity), as well as inflammatory markers (tumour necrosis factor-a and interleukin-1β), in bronchoalveolar lavage fluid and testicular tissue. Finally, the therapy decreased the levels of fibrogenic markers (transforming growth factor-β and hydroxyproline) and ameliorated the histological alterations (as assessed by lung fibrosis grading and testicular Johnsen scores). The co-administration of glibenclamide (a KATP channel blocker) blocked the protective effects of nicorandil. In conclusion, KATP channel activation plays an important role in the protective effect of nicorandil against cyclophosphamide-induced lung and testicular toxicity.

Keywords: Nicorandil cyclophosphamide KATP channel lung Testis.

1206. Synthesis and Biological Evaluation of Novel Homoisoflavonoids for Retinal Neovascularization

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Eye diseases characterized by excessive angiogenesis such as wet age-related macular degeneration, proliferative diabetic retinopathy, and retinopathy of prematurity are major causes of blindness. Cremastranone is an antiangiogenic, naturally occurring homoisoflavanone with efficacy in retinal and choroidal neovascularization models and antiproliferative selectivity for endothelial cells over other cell types. We undertook a cell-based structure-activity relationship study to develop more potent cremastranone analogues, with improved antiproliferative selectivity for retinal endothelial cells. Phenylalanyl-incorporated homoisoflavonoids showed improved activity and remarkable selectivity for retinal microvascular endothelial cells. A lead compound inhibited angiogenesis in vitro without inducing apoptosis and had efficacy in the oxygen-induced retinopathy model in vivo.

Keywords: Angiogenesis; Cremastranone; Structure-activity relationship.

1207. Avemar and Echinacea Extracts Enhance Mobilization and Homing of CD34⁺ Stem Cells in Rats With Acute Myocardial Infarction

Maha Abdelmonem, Samar H. Kassem, Hala Gabr, Amira A. Shaheen and Tarek Aboushousha

Introduction Activation of endogenous stem cell mobilization can contribute to myocardial regeneration after ischemic injury. This study aimed to evaluate the possible role of Avemar or Echinacea extracts in inducing mobilization and homing of CD34$^+$ stem cells in relation to the inflammatory and hematopoietic cytokines in rats suffering from acute myocardial infarction (AMI).

Methods: AMI was developed by two consecutive subcutaneous injections of isoprenaline (85 mg/kg). AMI rats were either post-treated or pre- and post-treated daily with oral doses of Avemar (121 mg/kg) or Echinacea (130 mg/kg). In whole blood, the number of CD34$^+$ cells was measured by flow cytometry and their homing to the myocardium was immunohistochemically assessed. Serum creatine kinase, vascular endothelial growth factor, interleukin-8 and granulocyte macrophage colony stimulating factor were determined on days 1, 7 and 14 after AMI. Sections of the myocardium were histopathologically assessed.

Results: Rats pre- and post-treated with Avemar or Echinacea exhibited substantial increases in the number of circulating CD34$^+$ cells, peaking on the first day after AMI to approximately 13-fold and 15-fold, respectively, with a decline in their level on day 7 followed by a significant increase on day 14 compared to their corresponding AMI levels. Only post-treatment with Echinacea caused a time-dependent increase in circulating CD34$^+$ cells on days 7 and 14. Such increases in circulating CD34$^+$ cells were accompanied by increased homing to myocardial tissue 14 days after AMI. Interestingly, pre- and post-treatment with Avemar or Echinacea substantially increased serum creatine kinase on day 1, normalized its activity on day 7 and, on continued treatment, only Echinacea markedly increased its activity on day 14 compared to the corresponding AMI values. Moreover, both treatments modified differently the elevated serum vascular endothelial growth factor and the lowered granulocyte macrophage colony stimulating factor levels of the AMI group but did not affect the level of interleukin-8. These results were supported histopathologically by reduced inflammatory reactions and enhanced neovascularization.

Conclusion: Avemar and Echinacea extracts can effectively induce mobilization and homing of CD34+ stem cells to the myocardial tissue and thus may help in stem cell-based regeneration of the infarcted myocardium.

Keywords: CD34$^+$ stem cells; Myocardial infarction; Avemar; Echinacea.

1208. Serum Interferon-related Micrornas as Biomarkers to Predict the Response to Interferon Therapy in Chronic Hepatitis C Genotype 4

Tarek Kamal Motawi, Olfat Gamil Shaker, Shohda Assem El-Maraghy and Mahmoud Ahmed Senousy

MicroRNAs are messengers during interferon-virus interplay and are involved in antiviral immunity, however, little is known about interferon-related microRNAs regarding their detection in serum and their potential use as non-invasive diagnostic and prognostic biomarkers in chronic hepatitis C (CHC). To elucidate some of the molecular aspects underlying failure of pegylated interferon-a/ribavirin therapy, we investigated pretreatment expression profiles of seven selected interferon-related microRNAs (miR-146a, miR-34a, miR-130a, miR-19a, miR-192, miR-195, and miR-296) by quantitative RT-PCR custom array technology in serum of Egyptian CHC genotype 4 patients and whether their

pretreatment levels would predict patient response to the combination therapy. One hundred and six CHC patients and forty matched healthy controls were included. Patients were divided into sustained virological response (SVR) and non-responder (NR) groups. Serum miR-34a, miR-130a, miR-19a, miR-192, miR-195, and miR-296 were upregulated, whereas serum miR-146a was downregulated in CHC compared to controls. Significant correlations were found between expression levels of studied microRNAs and also with clinical data. Pretreatment levels of miR-34a, miR-130a, and miR-195 were significantly higher, whereas miR-192 and miR-296 levels were significantly lower in SVR than NR patients. miR-19a and miR-146a levels were not significantly different between the two groups. miR-34a was superior to differentiate CHC from controls, whereas miR-296 was superior to discriminate SVR from NR patients by receiver operating characteristic analysis. Multivariate logistic analysis revealed miR-34a and miR-195 as independent predictors for SVR and miR-192 as an independent variable for non-response. In conclusion, pretreatment expression profiles of five interferon-related microRNAs are associated with treatment outcome in CHC. Of these, miR-34a, miR-195, and miR-192 could predict treatment response. The profiling results could be used as novel non-invasive diagnostic and prognostic pharmacogenetic biomarkers for treatment personalization in CHC and could help to identify new microRNA-based antivirals.
Keywords: Serum interferon-related micrornas; Interferon therapy; Chronic hepatitis C genotype 4.

1209. Serum Micrornas as Potential Biomarkers for Early Diagnosis of Hepatitis C Virus-Related Hepatocellular Carcinoma in Egyptian Patients

Tarek K. Motawi, Olfat G. Shaker, Shohda A. El-Maraghy and Mahmoud A. Senousy

Circulating microRNAs are deregulated in liver fibrosis and hepatocellular carcinoma (HCC) and are candidate biomarkers. This study investigated the potential of serum microRNAs; miR-19a, miR-296, miR-130a, miR-195, miR-192, miR-34a, and miR-146a as early diagnostic biomarkers for hepatitis C virus (HCV)-related HCC. As how these microRNAs change during liver fibrosis progression is not clear, we explored their serum levels during fibrosis progression in HCV-associated chronic liver disease (CLD) and if they could serve as non-invasive biomarkers for fibrosis progression to HCC. 112 Egyptian HCV-HCC patients, 125 non-malignant HCV-CLD patients, and 42 healthy controls were included. CLD patients were subdivided according to Metavir fibrosis-scoring. Serum microRNAs were measured by qRT-PCR custom array. Serum microRNAs were deregulated in HCC versus controls, and except miR-130a, they were differentially expressed between HCC and CLD or late fibrosis (F3-F4) subgroup. Serum microRNAs were not significantly different between individual fibrosis-stages or between F1-F2 (early/moderate fibrosis) and F3-F4. Only miR-19a was significantly downregulated from liver fibrosis (F1-F3) to cirrhosis (F4) to HCC. Individual microRNAs discriminated HCC from controls, and except miR-130a, they distinguished HCC from CLD or F3-F4 patients by receiver-operating-characteristic analysis. Multivariate logistic analysis revealed a panel of four microRNAs (miR-19a, miR-195, miR-192, and miR-146a) with high diagnostic accuracy for HCC (AUC = 0.946). The

microRNA panel also discriminated HCC from controls (AUC = 0.949), CLD (AUC = 0.945), and F3-F4 (AUC = 0.955). Studied microRNAs were positively correlated in HCC group. miR-19a and miR-34a were correlated with portal vein thrombosis and HCC staging scores, respectively. In conclusion, studied microRNAs, but not miR-130a, could serve as potential early biomarkers for HCC in high-risk groups, with miR-19a as a biomarker for liver fibrosis progression to cirrhosis to HCC. We identified a panel of four serum microRNAs with high accuracy in HCC diagnosis. Additional studies are required to confirm this panel and test its prognostic significance.
Keywords: Micrornas; Hepatitis C virus; Hepatocellular carcinoma; Egyptian patients.

1210. Micrornas as Predictor Markers for Response to Interferon Treatment of Chronic Hepatitis C Genotype-4 in Egyptian Patients

Tarek M. K. Motawi, Sherine M. Rizk, Olfat G. Shaker and Olfat Z. H. Mokhtar

Background: Hepatitis C virus genotype 4 (HCV-4) infection is common in the Middle East and Africa, with an extraordinarily high prevalence in Egypt. MicroRNAs (miRNAs) play an important role in various diseases, including HCV infection. The aim of the present study was to assess serum miR-122, miR-221 and miR-21 expression profiles in HCV-4 patients prior to treatment with HCV-4 combination therapy (pegylated alpha interferon and ribavirin) and to determine whether the miRNAs were associated with the drug response.
Methods: RNA was extracted from pretreatment serum samples, and miR-122, miR-221 and miR-21 levels were measured by quantitative PCR. The results were compared among patients with sustained virological responses (SVR) and non-responders (NR).
Results: The expression levels of miR-21 and miR-122 were significantly different between the SVR and NR groups. Receiver operator characteristic (ROC) analysis revealed that the sensitivity, specificity and positive predictive values of miR-21 were 82.2%, 77.3% and 88.1%, respectively, with a cut-off value of 1.7. The sensitivity, specificity and positive predictive values of miR-122 were 68.9%, 59.1% and 77.5%, respectively, with a cut-off value of 3.5.
Conclusion and Significance: miR-21 and miR-122 might be useful predictors for SVR in HCV-4 patients prior to the administration of combination therapy. A higher predictive response power was obtained for miR-21 than for miR-122. These results should reduce ineffective treatments.
Keywords: Micrornas; Interferon treatment; Hepatitis C genotype-4; Egyptian patients.

1211. Micrornas 9 and 370 Association with Biochemical Markers in T2D and CAD Complication of T2D

Tarek M. Motawae, Manal F. Ismail, Marwa I. Shabayek and Mae M. Seleem

Background: MicroRNAs (miRNAs) are small non coding RNAs with essential roles, of which any alteration leads to

several conditions. Their roles in diabetes (DM) and its vascular complications have not been completely assessed.

Aim: to study the association of two miRNAs; 9 and 370, with biochemical parameters of type 2 diabetic (T2D), dyslipidemia and coronary artery disease (CAD).

Subjects and Methods: Blood samples were taken from 200 subjects of both genders, in the Outpatient clinic of Al Qasr El-Einy teaching hospitals, in which levels of both miRNAs (using real time PCR) and routine parameters were measured. Subjects were divided over four groups, 50 in each group as follows; patients with T2D, patients with CAD, patients with T2D and CAD, and healthy control subjects.

Main Outcome: miRNA 9 levels were expected to be over expressed in diabetic patients, while miRNA 370 levels were expected to be over expressed in those suffering from CAD and their association with CAD complication of T2D.

Results: miRNA 9 levels were significantly higher in T2D patients and T2D patients with CAD, (1.18±0.07, and 1.31±0.08 respectively), while miRNA 370 levels were significantly higher in T2D patients, CAD patients, and T2D patients with CAD (0.59±0.05, 1.00±0.05, and 1.20±0.06 respectively), compared to control group at p = 0.000. In addition both miRNAs were still significantly associated with each other even after conducting multiple regression analysis.

Conclusion: This study associates the possible role of miRNAs in the diagnosis/prognosis of CAD complication of T2

Keywords: Microrna 9; Microrna 370 T2D; CAD.

1212. Therapeutic Potential of Date Palm Pollen for Testicular Dysfunction Induced by Thyroid Disorders in Male Rats

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Hyper- or hypothyroidism can impair testicular function leading to infertility. The present study was designed to examine the protective effect of date palm pollen (DPP) extract on thyroid disorder-induced testicular dysfunction. Rats were divided into six groups. Group I was normal control. Group II received oral DPP extract (150 mg kg(-1)), group III (hyperthyroid group) received intraperitoneal injection of L-thyroxine (L-T4, 300 µg kg(-1); i.p.), group IV received L-T4 plus DPP extract, group V (hypothyroid group) received propylthiouracil (PTU, 10 mg kg(-1); i.p.) and group VI received PTU plus DPP extract. All treatments were given every day for 56 days. L-T4 or PTU lowered genital sex organs weight, sperm count and motility, serum levels of luteinizing hormone (LH), follicle stimulating hormone (FSH) and testosterone (T), testicular function markers and activities of testicular 3β-hydroxysteroid dehydrogenase (3β-HSD) and 17β-hydroxysteroid dehydrogenase (17β-HSD). Moreover, L-T4 or PTU increased estradiol (E2) serum level, testicular oxidative stress, DNA damage and apoptotic markers. Morphometric and histopathologic studies backed these observations. Treatment with DPP extract prevented LT4- or PTU induced changes. In addition, supplementation of DPP extract to normal rats augmented sperm count and motility, serum levels of LH, T and E2 paralleled with increased activities of 3 β-HSD and 17 β-HSD as well as testicular antioxidant status. These results provide evidence that DPP extract may have potential protective effects on testicular dysfunction induced by altered thyroid hormones.

Keywords: Date palm pollen; Testicular dysfunction; Thyroid Disorder; L-Thyroxine; Propylthiouracil; Testis.

1213. Modulatory Effects of L-arginine and Soy Enriched Diet on Bone Homeostasis Abnormalities in Streptozotocin-induced Diabetic Rats

Shohda A. El-Maraghy and Noha Ali Mehana

Chemico-Biological Interactions, 229: 9-16 (2015) IF: 2.577

Diabetes mellitus is a complex syndrome which is responsible for numerous complications affecting the whole body. Osteoporosis is regarded as one of the chronic complications of diabetes mellitus that results from reduced bone formation and increased resorption. In this context, we searched for dietary supplements that preserve diabetic bone loss. Parathyroid hormone (PTH) has been suggested as a possible mechanism affecting bone homeostasis in streptozotocin (STZ)-induced diabetic rats. The osteoprotective effects of L-arginine and soy enriched diet were also investigated. Male Wistar rats were allocated into four groups; normal control, untreated STZ-diabetic rats and STZ-diabetic rats treated with either L-arginine (10 mg/kg/day) or fed soy enriched diet (200 g/kg diet) for 12 weeks. L-Arginine and soy enriched diet normalized serum PTH level and increased serum osteocalcin level; bone osteocalcin, osteoprotegerin and runt-related transcription factor2 mRNA levels compared to diabetic rats. A decrease in serum pyridinoline, C-terminal telopeptides of type I collagen, cathepsin k levels and bone cathepsin k mRNA level was observed in both treated groups. Both treatments increased serum insulin and insulin like growth factor-1 levels and decreased urinary calcium excretion. In conclusion, L-arginine and soy enriched diet are effective in prevention of osteoporosis associated with diabetes mellitus.

Keywords: L-Arginine; Soyenriched diet; Bone; Diabetic rats.

1214. Gastroprotective Effect of Crocin in Ethanol-Induced Gastric Injury in Rats

Shohda A. El-Maraghy, Sherine M. Rizk and Nancy N. Shahin

Chemico-Biological Interactions, 229: 26-35 (2015) IF: 2.577

The present study investigated the gastroprotective effect of crocin in ethanol-induced gastric injury in rats. Rats were allocated into a normal group, an ulcer group, a crocin-treated group, an ulcer group pretreated with crocin, and an ulcer group pretreated with omeprazole as a reference anti-ulcer drug. Rats were sacrificed 3h after ethanol administration. Prophylactic administration of crocin (50mg/kg/day, i.p.) for 3 consecutive days before the administration of 70% ethanol (10 ml/kg, orally) resulted in significant gastroprotection compared to ethanol-ulcerated rats as manifested by significant reduction in the gastric ulcer index. Crocin pretreatment increased ethanol-lowered levels of gastric juice mucin and mucosal prostaglandin E2 (PGE2) and interleukin-6 (IL-6). Moreover, crocin significantly decreased ethanol-elevated tumor necrosis factor-alpha (TNF-a) level, myeloperoxidase activity and heat shock protein 70 mRNA and protein levels. It also restored ethanol-altered mucosal levels of glutathione, malondialdehyde and superoxide dismutase activity. Furthermore, crocin-pretreatment alleviated ethanol-induced mucosal apoptosis as revealed by significant down-regulation of cytochrome c and caspase-3 mRNA expression, significant

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decrease in caspase-3 activity and mitigated DNA fragmentation as indicated by significant decrements in comet parameters. The protective efficacy of crocin was further supported by histological assessment. No significant difference was observed between crocin and omeprazole (20mg/kg orally 1h before ethanol administration) regarding their mucin-secretagogue and antioxidant effects, as well as their effects on TNF-a, IL-6 and cytochrome c. On the other hand, omeprazole was superior in enhancing PGE2 level and in alleviating neutrophil infiltration, caspase-3 activation and DNA fragmentation. Conclusively, crocin protects rat gastric mucosa against ethanol-induced injury via anti-inflammatory, anti-oxidative, anti-apoptotic and mucin-secretagogue mechanisms that are probably mediated by enhanced PGE2 release.

Keywords: Apoptosis; Crocin; Ethanol-induced gastric injury; Gastric defensive factors; Inflammation; Oxidative stress.

1215. Combination of Imatinib and Clotrimazole Enhances Cell Growth Inhibition in T47D Breast Cancer Cells

Tarek M.K. Motawi, Nermin A.H. Sadik, Sally A. Fahim and Samia A. Shouman

Imatinib mesylate (IM), a tyrosine kinase inhibitor, is used as targeted cancer therapy. However, mono-targeting by IM does not always achieve full tumor eradication and thus it is recommended to combine IM with other anticancer agents. Clotrimazole (CLT) is an antifungal azole derivative with promising anticancer effects due to inhibiting the activity of glycolytic enzymes. The present study aimed to evaluate the effect of combining CLT with IM on breast cancer cell line in an attempt to establish effective new combination. T47D human breast cancer cell line was treated with different concentrations of IM and/or CLT for 48 h. IM-CLT interaction was determined by isobologram equation and combination index. Cell viability was confirmed by measuring LDH activity. As indicators of glycolysis inhibition, the expression of hexokinase-2 (HK-2) and 6-phosphofructo-1-kinase (PFK-1) plus the activity of intracellular lactate dehydrogenase (LDH) and pyruvate kinase (PK) were determined. In addition, glucose consumption and adenosine triphosphate (ATP) production were measured. Moreover, nitric oxide (NO), vascular endothelial growth factor (VEGF) and hypoxia inducible factor-*a* (HIF-*a*) were also determined as they are modulators for glycolysis. This study demonstrated that IM or CLT synergistically inhibited cell growth in T47D as shown by combination and dose reduction indices. The combination of 15 µM IM and 20 µM CLT significantly decreased glucose consumption, activity of both PK and intracellular LDH, while increased leaked LDH, VEGF and NO in the medium compared to each drug alone. Furthermore the combination decreased gene expression of HK-2, PFK-1 and ATP content compared to the control. In conclusion, the synergistic effect of CLT on IM cytotoxicity in T47D cell line maybe mediated through inhibition of glycolysis and increasing both NO and VEGF. Further studies are required to confirm the efficiency and safety of this combination.

Keywords: Clotrimazole; Hexokinase-2; Imatinib; Phosphofructo-1-Kinase; Pyruvate kinase; T47D.

1216. Single-nucleotide Polymorphism of Toll-like Receptor 4 and Interleukin-10 in Response to Interferon-based Therapy in Egyptian Chronic Hepatitis C Patients

Nermin Abd El-Hamid Sadik, Olfat Gamil Shaker, Hassan Zaki Ghanem, Heba Akram Hassan and Abd El-Hamid Zaki Abd El-Hamid

Egypt has the highest prevalence of hepatitis C virus (HCV) in the world. It has been suggested that not only the virus but also the interaction between the virus and the host immune system is important in determining the course of the infection and the response to interferon (IFN)-based therapy.

While the adaptive immune system plays a critical role in HCV infection, the innate immune system has only been recognized recently. Toll-like receptors (TLRs) form the cornerstone of the innate immune response. Interleukin-10 (IL-10) is one of the upstream regulators of TLR4. A possible interplay between TLR4 and IL-10 has been suggested.

The present study aimed to investigate the role of single-nucleotide polymorphisms (SNPs) in TLR4 and IL-10-1082 and the expression levels of these proteins in predicting the response to treatment in chronic HCV patients. A total of 83 chronic HCV-infected Egyptian patients treated with peg-IFN-*a*2b-ribavirin combination therapy and 40 healthy subjects were included in this study. SNPs in the TLR4 rs2149356 and IL-10-1082 genes and their serum levels were assessed.

Within the responders group, T/T and A/A genotypes were the significantly most frequent genotypes of TLR4 and IL-10-1082, respectively. Moreover, a higher frequency of T/T and A/A was found to be associated with lower serum TLR4 and IL-10 levels in our responder patients. In addition, subjects with the T/T genotype in the healthy control group had a lower serum TLR4 level than those with other genotypes. We conclude that the SNPs TLR4 rs2149356-T/T and IL-10-1082-A/A may be important predictors for HCV therapy.

Keywords: Hepatitis C patients; TLR4; Single-nucleotide Polymorphism; PEG-IFN-A2B; Ribavirin.

1217. Association of Polymorphism in Adiponectin (+45 T/G) and Leptin (-2548 G/A) Genes With Type 2 Diabetes Mellitus in Male Egyptians

Tarek Motawi, Tarek Salman, Olfat Shaker and Amr Abdelhamid

Introduction: Adiponectin is an adipose tissue-specific protein with insulin-sensitizing properties. Many investigators have explored the association between adiponectin single nucleotide polymorphisms (SNPs) and type 2 diabetes mellitus (T2DM) in different ethnic populations from different regions. Leptin is a protein hormone constituting an important signal in the regulation of adipose tissue mass and body weight. The aim of this study was to explore potential associations between SNP +45 T>G of the adiponectin gene and SNP 2548G/A of leptin with T2DM and the effect of SNPs on serum adiponectin and leptin levels. **Material and Methods**: From the Egyptian population, we enrolled 110 T2DM patients and 90 non-diabetic controls. Serum lipid profile, blood glucose, serum adiponectin, and leptin were measured. Genotyping for two common SNPs of the adiponectin

and leptin genes was performed by polymerase chain reaction-restriction fragment length polymorphism.

Results: The G allele and TG/GG genotype of SNP 45 occurred more frequently than the T allele and TT genotype in T2DM patients compares to the controls. Subjects with the GG + TG genotype of SNP 45 were at increased risk for T2DM (OR = 6.476; 95% CI: 3.401-12.33) and associated with a low serum adiponectin level compared with the TT genotype. The serum leptin concentration of GA + AA genotype carriers was not significantly different from that of the GG genotype in the diabetic group.

Conclusions: The G allele carriers who have reduced plasma concentrations of adiponectin may have an association with T2DM, while leptin SNP 2548 G/A is not associated with the risk of development of T2DM in the Egyptian population.

Keywords: Polymerase chain reaction–restriction fragment length polymorphism; Single nucleotide polymorphism.

1218. Neuroprotective Effect of EGB761® and Low-Dose Whole-Body γ-Irradiation in A Rat Model of Parkinson's Disease

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Toxicology and Industrial Health, 31(12): 1128-1143 (2015) IF: 1.859

Parkinson's disease (PD) is the second most common neurodegenerative disorder after Alzheimer's disease. The present study was undertaken to investigate the pretreatment effects of standardized Ginkgo biloba extract (EGb761(®)) and low-dose whole-body γ-irradiation on the neurological dysfunction in the reserpine model of PD.

Male Wistar rats were pretreated orally with EGb761 or fractionated low-dose whole-body γ-irradiation or their combination, then subjected to intraperitoneal injection of reserpine (5 mg/kg body weight) 24 h after the final dose of EGb761 or radiation.

Reserpine injection resulted in the depletion of striatal dopamine (DA) level, increased catalepsy score, increased oxidative stress indicated via depletion of glutathione (GSH), increased malondialdehyde (MDA) and iron levels, decreased DA metabolites metabolizing enzymes; indicated by inhibition by glutathione-S-transferase, and nicotinamide adenine dinucleotide phosphate (NADPH)-quinone oxidoreductase (NQO) activities, mitochondrial dysfunction; indicated by declined complex I activity, and adenosine triphosphate (ATP) level and increased apoptosis; indicated by decreased mitochondrial B cell lymphoma-2 (Bcl-2) protein level and by transmission electron microscope. EGb761 and low-dose γ-radiation ameliorated the reserpine-induced state of oxidative stress, mitochondrial dysfunction, and apoptosis in brain.

It can be concluded that EGb761, a widely used herbal medicine and low dose of γ-irradiation have protective effects for combating Parkinsonism possibly via replenishment of GSH levels.

Keywords: Parkinsonism; Reserpine; Low dose whole-body γ-irradiation; Ginkgo biloba; Rats.

1219. Gene Polymorphisms of Il-10 and MxA in Responders and Non-responders to Interferon Therapy in HCV Egyptian Patients Genotype 4

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Cell Biochem Biophys, 71: 617-625 (2015) IF: 1.68

Hepatitis C virus (HCV) is a major cause of chronic liver disease, with about 170 million people infected worldwide. The standard regimen for treatment of HCV consists of a combination of pegylated interferon with ribavirin. Failure of interferon-a treatment in patients with chronic HCV infection remains a challenging obstacle. Both viral and host environmental factors have been implicated in reducing responsiveness to IFN-*a* therapy. Host genetic diversity is also believed to contribute to the different clinical outcomes in HCV infection. The objective of the study was to investigate the association of both IL-10 (-819 and -592) and MxA (-88 and -123) single-nucleotide polymorphisms (SNPs) of the promoter regions, with response to interferon (IFN) therapy in Egyptian patients infected with HCV genotype 4. Polymorphisms of both genes in 85 HCV patients and 100 controls were determined by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) technique. The frequency of SNP was compared between sustained responders ($n = 52$) and non-responders ($n = 33$), as determined by biochemical and virological response to IFN and ribavirin combined therapy. The frequency of the -819T/T and the -592A/A genotypes of IL-10 was significantly higher among responders compared to non-responders (51.92 vs 39.4 %, $P = 0.03$; 51.92 vs 42.42 %; $P = 0.046$ respectively). The G/G genotype at position -88 of the MxA gene was significantly lower in responders than in non-responders (25 vs 75.76 %, $P = 0.046$), whereas heterozygotes (G/T) were more likely responders (65.38 vs 18.18 %, $P = 0$). The -123C/A genotype was significantly associated with responders (48.08 vs 30.30 %, $P = 0.014$). Findings suggest that homozygosity for both -819T/T and -592A/A polymorphisms of IL-10 gene and that heterozygosity for both -88G/T and -123C/A polymorphisms of the MxA gene are important host factors that influence the response to IFN therapy in patients with chronic HCV infection.

Keywords: Chronic hepatitis C; Host Factors; IL-10 Promoter Gene; MxA Promoter Gene; Single-nucleotide polymorphism; Sustained virological response response.

1220. A Simple Optical Coherence Tomography Quantification Method for Choroidal Neovascularization

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Journal of Ocular Pharmacology and Therapeutics, 31: 447-454 (2015) IF: 1.47

Purpose: Therapeutic efficacy is routinely assessed by measurement of lesion size using flatmounted choroids and confocal microscopy in the laser-induced choroidal neovascularization (L-CNV) rodent model. We investigated whether optical coherence tomography (OCT) quantification, using an ellipsoid volume measurement, was comparable to standard ex vivo evaluation methods for this model and whether

this approach could be used to monitor treatment-related lesion changes.

Methods: Bruch's membrane was ruptured by argon laser in the dilated eyes of C57BL/6J mice, followed by intravitreal injections of anti-VEGF$_{164}$ or vehicle, or no injection. In vivo OCT images were acquired using Micron III or InVivoVue systems at 7, 10, and/or 14 days post-laser and neovascular lesion volume was calculated as an ellipsoid. Subsequently, lesion volume was compared to that calculated from confocal Z-stack images of agglutinin-stained choroidal flatmounts.

Results: Ellipsoid volume measurement of orthogonal 2-dimensional OCT images obtained from different imaging systems correlated with ex vivo lesion volumes for L-CNV (Spearman's p=0.82, 0.75, and 0.82 at days 7, 10, and 14, respectively). Ellipsoid volume calculation allowed temporal monitoring and evaluation of CNV lesions in response to antivascular endothelial growth factor treatment.

Conclusions: Ellipsoid volume measurements allow rapid, quantitative use of OCT for the assessment of CNV lesions in vivo. This novel method can be used with different OCT imaging systems with sensitivity to distinguish between treatment conditions. It may serve as a useful adjunct to the standard ex vivo confocal quantification, to assess therapeutic efficacy in preclinical models of CNV, and in models of other ocular diseases.

Keywords: Ocular angiogenesis; Optical coherence tomography; Therapeutics.

1221. Effect of Vitamin D Therapy on Interleukin-6, Visfatin, and Hyaluronic Acid Levels in Chronic Hepatitis C Egyptian Patients

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Objectives: We aimed to compare serum levels of interleukin-6, visfatin, and hyaluronic acid in chronic hepatitis C Egyptian patients who received standard of care (SOC) therapy for chronic hepatitis C virus (HCV) consisting of pegylated interferon (PEG-IFN) and ribavirin (RBV) and in those who received SOC with vitamin D (vit D) for 48 weeks in HCV genotype 4a subjects.

Design and Methods: One hundred chronic HCV patients were classified into two groups: study 50 patients received SOC therapy PEG-IFN/RBV + vit D and control 50 patients received SOC PEG-IFN/RBV without vit D. Both groups were followed up at 12 weeks, 24 weeks, and 48 weeks of treatment.

Results: Results showed a significant elevation in vit D levels in the group treated with SOC and vit D compared to SOC group and a reduction in HCV RNA from the 12th week to reach zero level in the 24th week. Interleukin-6, visfatin, and hyaluronic acid levels were also reduced significantly. Alanine transaminase and aspartate transaminase biomarkers were significantly reduced, indicating decreased liver injury.

Conclusion: SOC PEG-IFN/RBV + vit D therapy for chronic HCV led to reduced interleukin-6, visfatin, and hyaluronic acid levels and follow up liver biochemical biomarkers as aspartate transaminase and alanine transaminase indicates proper liver healing and monitoring.

Keywords: Alt; Ast; HCV 4A RNA; Hepatitis C Virus; Pegylated interferon; Ribavirin.

1222. Methylenetetrahydrofolate Reductase Gene Polymorphisms in Egyptian Turner Syndrome Patients

Manal F. Ismail, Waheba A. Zarouk, Mona O. Ruby, Wael M. Mahmoud and Randa S. Gad

Folate metabolism dysfunctions can result in DNA hypomethylation and abnormal chromosome segregation. Two common polymorphisms of the methylenetetrahydrofolate reductase (MTHFR) encoding gene (C677T and A1298C) reduce MTHFR activity, but when associated with aneuploidy, the results are conflicting. Turner Syndrome (TS) is an interesting model for investigating the association between MTHFR gene polymorphisms and nondisjunction because of the high frequency of chromosomal mosaicism in this syndrome.

Objective: To investigate the association of MTHFR gene C677T and A1298C polymorphisms in TS patients and their mothers and to correlate these polymorphisms with maternal risk of TS offspring.

Subjects and Methods: MTHFR C677T and A1298C polymorphisms were genotyped in 33 TS patients, their mothers and 15 healthy females with their mothers as controls using polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) and sequencing technique.

Results: Genotype and allele frequencies of both C677T and A1298C were not significantly different between TS cases and controls. There were no significant differences in C677T genotype distribution between the TS mothers and controls (p=1). The MTHFR 1298AA and 1298AC genotypes were significantly increased in TS mothers Vs. control mothers (p=0.002). The C allele frequency of the A1298C polymorphism was significantly different between the TS mothers and controls (p=0.02). The association of A1298C gene polymorphism in TS patients was found to increase with increasing age of both mothers (p=0.026) and fathers (p=0.044) of TS cases.

Conclusion: Our findings suggest a strong association between maternal MTHFR A1298C and risk of TS in Egypt.

Keywords: Cchromosomal nondisjunction; DNA methylation; Folate; MTHFR gene; Turner syndrome.

1223. Assessment of Thyroid Hormones Status and Some Adipocytokines Among Egyptian Obese Children

Aya A. Ayman, Hebatallah A. Darwish, Awatif M. Abd El-Maksoud and Amira A Shaheen

Childhood obesity is one of the most serious public health problems facing the developed and increasingly, the developing world. In this study, we aimed to investigate the possible role of thyroid hormones and some adipokines in childhood obesity.

Materials and Methods: A total of 80 children were enrolled; 50 obese children and 30 non-obese of matched age and sex. Clinical, demographic characteristics and lipid profile levels were

monitored. Plasma levels of thyroid hormones, leptin, IL-1a and TNF-a were measured in these subjects.

Results: Dyslipidemia was evident in obese children relative to normal ones. Obese children exhibited a significant reduction in TSH and free- T4 levels. There was an increment in both leptin and IL-1a levels of obese children, however, their TNF-a level were significantly decreased.

Conclusion: Alterations in thyroid hormones status, leptin, IL-1a and TNF-a are associated with obesity in Egyptian children.

Keywords: Children; Il-1*a*; Leptin; Obesity; Thyroid hormones; TNF-*a*.

1224. Genetic Variants Associated With the Risk of Diabetic Nephropathy

Manal Fouad Ismail, Olfat Gamil Shaker, Esmat Ashour, Heba Mourad Yousif, Mie Afify and Weaam Gouda

Jokull, 65: 359-379 (2015) IF: 0.765

Background: One of the most common complications of diabetes mellitus is diabetic nephropathy (DN). The objective of the study was to investigate the relationship between variants of transcription factor 7–like 2 (TCF7L2) and peroxisome proliferator-activated receptor gamma coactivator-1 alpha (PPARGC1A) gene polymorphisms individually or in combination with the progression of nephropathy in type 2 diabetes mellitus (T2DM) patients.

Methods: Eighty five T2DM patients (Forty five with nephropathy and forty without nephropathy), and forty five healthy control subjects were included in the study. The polymorphisms were evaluated by PCR/RFLP analysis.

Results: The frequency of TCF7L2 rs7903146 TT genotype and T allele were significantly associated with DN patients compared to normal controls (P= 0.016 and 0.008), respectively and compared to T2DM patients without nephropathy (P=0.023 and 0.018), respectively. A significant differences in AA genotype distribution for the Gly482Ser polymorphism of PPARGC1A gene was observed between T2DM with nephropathy cases compared to control subjects (P=0.002). Moreover, a significant association in A allelic frequencies was observed in DN cases compared to control subjects at P=0.019 and compared to T2DM patients without nephropathy at P= 0.035. No differences in the genotypic and allelic frequencies between cases and controls were found for the Thr394Thr polymorphism.

Conclusions: Our study suggests that candidate gene polymorphisms rs7903146 of TCF7L2 and Gly482Ser of PPARGC1A may serve as a susceptibility biomarker for nephropathy in type 2 diabetes mellitus patients

Keywords: Diabetic nephropathy; Type 2 Diabetes mellitus; Transcription Factor 7–Like 2; Peroxisome proliferator activated receptor gamma coactivator-1 alpha gene polymorphism.

1225. Effect of Methotrexate Combined With Ginger, Silymarin or Propolis on the mRNA Expression Levels of Cytochrome P450 Oxidoreductase (POR), Caspase 3 (CASP-3) and Interlukin 6 (IL-6)

Amal A. M. Hassan, Manal F. Ismail and Hanaa M. Mohamed

African Journal of Biotechnology, 14: 695-701 (2015)

The present study was performed to evaluate the effect of three natural antioxidants on the adverse effect of methotrexate (MTX) in normal liver cells. TaqMan RT-PCR technology was used to estimate the mRNA expression levels for three genes after rats injection with a single dose of 20 mg/kg b.w MTX or the same MTX dose combined with ginger, silymarin or propolis oral administration. The doses of ginger, silymarin or propolis were similar (200 mg/kg b.w) and were daily administrated to rats for 21 days before MTX injection and four days after MTX injection. The three genes were: cytochrome P450 oxidoreductase (POR) that encodes POR enzyme, caspase 3 (CASP-3) that encodes CASP-3 enzyme and interlukin 6 (IL-6) that encodes IL-6 pro-inflammatory cytokine.

Results: indicate that the used MTX single dose of 20 mg/kg b.w did not significantly affect POR mRNA expression level in rat liver. Moreover the administration of ginger, silymarin or propolis with MTX did not significantly increase or decrease POR mRNA expression level. Results also reveal insignificant increase in CASP-3 mRNA expression level after MTX injection and also after administration of ginger or propolis with MTX.

The administration of silymarin with MTX significantly increased the CASP-3 mRNA expression level. IL-6 mRNA expression level was insignificantly upregulated after injection with MTX and also after administration of silymarin with MTX whereas a significantly upregulation in the IL-6 mRNA expression level was reported after administration of ginger or propolis with MTX.

Keywords: Methotrexate; Ginger; Silymarin; Propolis; mRNA Expression.

1226. Genetic Polymorphism of Estrogen Receptor Alpha Gene in Egyptian Women With Type Ii Diabetes Mellitus

Tarek M. K. Motawi, Mahmoud A. El-Rehany, Sherine M. Rizk, Maggie M. Ramzy and Doaa M. El-Roby

Meta Gene, 6: 36-41 (2015)

Estrogen might play an important role in type 2 diabetes mellitus pathogenesis. A number of polymorphisms have been reported in the estrogen receptor alpha gene including the XbaI and PvuII restriction enzyme polymorphisms. The aim of this study was to determine if ESRa gene polymorphisms are associated with type 2 diabetes mellitus and correlated with lipid profile. Ninety diabetic Egyptian patients were compared with forty healthy controls. ESRa genotyping of PvuII and XbaI was performed using restriction fragment length polymorphism analysis.

Our study showed that there is more significant difference in the frequency of C and G polymorphic allele between patients and control groups in PvuII and XbaI respectively.

Also carriers of minor C and G alleles of PvuII and XbaI gene polymorphisms were associated with increased fasting blood glucose and disturbance in lipid profile as there is an increase in total cholesterol, triglycerides and Low density lipoprotein. So findings of present study suggest the possibility that PvuII and XbaI polymorphisms in ERa are related to T2DM and with increased serum lipids among Egyptian population.

Keywords: Era; Estrogen receptor alpha; Estrogen receptor Alpha; Fbg; Fasting blood glucose; Gene polymorphism; Pvuii; Rflp; Restriction fragment length polymorphism; Snp; Single Nucleotide polymorphism; Serum lipid profile; Type 2 diabetes; Xbai.

Medicine Sector

Dept. of Clinical Pharmacy

1227. Prophylactic Levofloxacin in Pediatric Neutropenic Patients During Autologous Hematopoietic Stem Cell Transplantation

Hanafy Ahmed Hafeza, Dalia Yousif, Maggie Abbassi, Yasser Elborai and Alaa Elhaddad

Background: Using fluoroquinolone prophylaxis in pediatric neutropenic patients is a controversial issue due to the concern about emergence of resistant strains in addition to the lack of pediatric studies. This study was performed to assess the effectiveness of levofloxacin prophylaxis in pediatric patients during autologous stem cell transplantation.
Methods: This was an observational study of pediatric patients who underwent autologous stem cell transplantation, comparing patients who received levofloxacin prophylaxis to historical controls.
Results: A total of 96 patients were included (46 patients in the control group and 50 patients received levofloxacin). The median duration till onset of first fever was 11 d in the control group as compared to 15 d in patients who received levofloxacin (p = 0.001). The incidence of infectious complications was higher in patients without levofloxacin (4/46) than those with levofloxacin (1/50). The median duration of empirical antibiotic use was 10 d in the levofloxacin group compared with 14 d in the control group (p < 0.001).
Conclusion: Levofloxacin prophylaxis delayed first spike of fever, decreased the incidence of septic complications, and shortened the duration of empiric antibiotic use, but its impact on emergence of resistant organisms should be closely monitored.
Keywords: Antibacterial prophylaxis; Autologous; Levofloxacin; Stem cell transplantation.

Dept. of Microbiology and Immunology

1228. Aminomethyl Spectinomycins as Therapeutics for Drug-resistant Respiratory Tract and Sexually Transmitted Bacterial Infections

David F. Bruhn, Samanthi L. Waidyarachchi, Dora B. Madhura, Dimitri Shcherbakov, Zhong Zheng, Jiuyu Liu, Yasser M. Abdelrahman, Aman P. Singh, Stefan Duscha, Chetan Rathi, Robin B. Lee, Robert J. Belland, Bernd Meibohm, Jason W. Rosch, Erik C. Böttger and Richard E. Lee

The antibiotic spectinomycin is a potent inhibitor of bacterial protein synthesis with a unique mechanism of action and an excellent safety index, but it lacks antibacterial activity against most clinically important pathogens. A series of N-benzyl-substituted 3'-(R)-3'-aminomethyl-3'-hydroxy spectinomycins was developed on the basis of a computational analysis of the aminomethyl spectinomycin binding site and structure-guided synthesis. These compounds had ribosomal inhibition values comparable to spectinomycin but showed increased potency against the common respiratory tract pathogens Streptococcus pneumoniae, Haemophilus influenzae, Legionella pneumophila, and Moraxella catarrhalis, as well as the sexually transmitted bacteria Neisseria gonorrhoeae and Chlamydia trachomatis. Non-ribosome-binding 3'-(S) isomers of the lead compounds demonstrated weak inhibitory activity in in vitro protein translation assays and poor antibacterial activity, indicating that the antibacterial activity of the series remains on target against the ribosome. Compounds also demonstrated no mammalian cytotoxicity, improved microsomal stability, and favorable pharmacokinetic properties in rats.
The lead compound from the series exhibited excellent chemical stability superior to spectinomycin; no interaction with a panel of human receptors and drug metabolism enzymes, suggesting low potential for adverse reactions or drug-drug interactions in vivo; activity in vitro against a panel of penicillin-, macrolide-, and cephalosporin-resistant S. pneumoniae clinical isolates; and the ability to cure mice of fatal pneumococcal pneumonia and sepsis at a dose of 5 mg/kg. Together, these studies indicate that N-benzyl aminomethyl spectinomycins are suitable for further development to treat drug-resistant respiratory tract and sexually transmitted bacterial infections.
Keywords: Antibiotic; Spectinomycin; Protein synthesis; Pathogens; N-Benzyl aminomethyl spectinomycins.

1229. Vacuolar ATPase "A2" Isoform Exhibits Distinct Cell Surface Accumulation and Modulates Matrix Metalloproteinase Activity in Ovarian Cancer

Arpita Kulshrestha, Gajendra K. Katara, Safaa Ibrahim, Sahithi Pamarthy , Mukesh K. Jaiswal, Alice Gilman Sachs and Kenneth D. Beaman

Tumor associated vacuolar H+-ATPases (V-ATPases) are multi-subunit proton pumps that acidify tumor microenvironment, thereby promoting tumor invasion. Subunit 'a' of its V0 domain is the major pH sensing unit that additionally controls sub-cellular targeting of V-ATPase and exists in four different isoforms.
Our study reports an elevated expression of the V-ATPase-V0a2 isoform in ovarian cancer(OVCA) tissues and cell lines(A2780, SKOV-3 and TOV-112D). Among all V0'a' isoforms, V0a2 exhibited abundant expression on OVCA cell surface while normal ovarian epithelia did not. Sub-cellular distribution of V-ATPase-V0a2 confirmed its localization on plasma-membrane, where it was also co-associated with cortactin, an F-actin stabilizing protein at leading edges of cancer cells. Additionally, V0a2 was also localized in early and late endosomal compartments that are sites for modulations of several signaling pathways in cancer.
Targeted inhibition of V-ATPase-V0a2 suppressed matrix metalloproteinase activity(MMP-9 and MMP-2) in OVCA cells. In conclusion, V-ATPase-V0a2 isoform is abundantly expressed on ovarian tumor cell surface in association with invasion assembly related proteins and plays critical role in tumor invasion by modulating the activity of matrix-degrading proteases. This study highlights for the first time, the importance of V-ATPase-V0a2 isoform as a distinct biomarker and possible therapeutic target for treatment of ovarian carcinoma.
Keywords: Vacuolar ATPase; A2 Isoform; Ovarian cancer; Invasion; Cortactin; MMP.

1230. Breast Cancer Associated A2 Isoform Vacuolar ATPase Immunomodulates Neutrophils: Potential Role in Tumor Progression

Safaa A. Ibrahim, Gajendra K. Katara, Arpita Kulshrestha, Mukesh K. Jaiswa, Magdy A. Amin and Kenneth D. Beaman

In invasive breast cancer, tumor associated neutrophils (TAN) represent a significant portion of the tumor mass and are associated with increased angiogenesis and metastasis. Identifying the regulatory factors that control TAN behavior will help in developing ideal immunotherapies. Vacuolar ATPases (V-ATPases), multi-subunit proton pumps, are highly expressed in metastatic breast cancer cells. A cleaved peptide from a2 isoform V-ATPase (a2NTD) has immunomodulatory role in tumor microenvironment. Here, we report for the first time the role of V-ATPase in neutrophils modulation. In invasive breast cancer cells, a2NTD was detected and a2V was highly expressed on the surface. Immunohistochemical analysis of invasive breast cancer tissues revealed that increased neutrophil recruitment and blood vessel density correlated with increased a2NTD levels. In order to determine the direct regulatory role of a2NTD on neutrophils, recombinant a2NTD was used for the treatment of neutrophils isolated from the peripheral blood of healthy volunteers. Neutrophils treated with a2NTD (a2Neuϕ) showed increased secretion of IL-1RA, IL-10, CCL-2 and IL-6 that are important mediators in cancer related inflammation. Moreover, a2Neuϕ exhibited an increased production of protumorigenic factors including IL-8, matrix metaloprotinase-9 and vascular endothelial growth factor. Further, functional characterization of a2Neuϕ revealed that a2Neuϕ derived products induce in vitro angiogenesis as well as increase the invasiveness of breast cancer cells. This study establishes the modulatory effect of breast cancer associated a2V on neutrophils, by the action of a2NTD, which has a positive impact on tumor progression, supporting that a2V can be a potential selective target for breast cancer therapy.
Keywords: a2 vacuolar atpase; Angiogenesis; Breast cancer; Invasion; Tumor associated neutrophils.

1231. Systems Biology-guided Identification of Synthetic Lethal Gene Pairs and its Potential Use to Discover Antibiotic Combinations

Ramy K. Aziz, Jonathan M. Monk, Robert M. Lewis, Suh In Loh, Arti Mishra , Amrita Abhay Nagle, Chitkala Satyanarayana, Saravanakumar Dhakshinamoorthy, Michele Luche, Douglas B. Kitchen, Kathleen A. Andrews, Nicole L. Fong, Howard J. Li, Bernhard O. Palsson and Pep Charusant

Mathematical models of metabolism from bacterial systems biology have proven their utility across multiple fields, for example metabolic engineering, growth phenotype simulation, and biological discovery. The usefulness of the models stems from their ability to compute a link between genotype and phenotype, but their ability to accurately simulate gene-gene interactions has not been investigated extensively. Here we assess how accurately a metabolic model for Escherichia coli computes one particular type of gene-gene interaction, synthetic lethality, and find that the accuracy rate is between 25% and 43%. The most common failure modes were incorrect computation of single

gene essentiality and biological information that was missing from the model. Moreover, we performed virtual and biological screening against several synthetic lethal pairs to explore whether two-compound formulations could be found that inhibit the growth of Gram-negative bacteria. One set of molecules was identified that, depending on the concentrations, inhibits E. coli and S. enterica serovar Typhimurium in an additive or antagonistic manner. These findings pinpoint specific ways in which to improve the predictive ability of metabolic models, and highlight one potential application of systems biology to drug discovery and translational medicine.
Keywords: Bacterial systems biology; Computer modelling; Pathogens; Virtual screening.

1232. High Prevalence of bla$_{NDM-1}$ Carbapenemase-Encoding Gene and 16S rRNA armA Methyltransferase Gene Among Acinetobacter Baumannii Clinical Isolates in Egypt

Mohamed Abd El-Gawad El-Sayed-Ahmed, Magdy Ali Amin, Wael Mustafa Tawakol, Lotfi Loucif, Sofiane Bakour and Jean-Marc Rolain

The main objective of this study was to decipher the molecular mechanism of resistance to carbapenems and aminoglycosides in a large series of 150 Acinetobacter baumannii clinical isolates collected from July 2012 to September 2013 in Egypt. We report for the first time the emergence of bla$_{NDM-1}$ and the cooccurrence of 16S rRNA methylase armA with bla$_{NDM-1}$ and bla$_{OXA-23}$ in Egyptian hospitals. Multilocus sequence typing identified 27 distinct sequence types, 11 of which were novel.
Keywords: Antibiotics; Resistance; Acinetobacter.

1233. Molecular Diagnosis of Bovine Tuberculosis in Bovine and Human Samples: Implications for Zoonosis

Md Rahman, Monira Noor, Kazi Mehetazul Islam, Md Masudur Bashir Uddin, Ferdaus Mohd Altaf Hossain, Mohammad Ali Zinnah, Mohammad Al Mamun, Mohammad Rafiqul Islam, Seong Kug Eo and Hossam M Ashour

Aim: To develop emerging diagnostic technique for bovine tuberculosis and to identify its potential risk factors.
Materials and Methods: Bacterial genomic DNA was isolated from bovine milk and human sputum samples and subjected to PCR using specific primer pairs. PCR results were validated using bacteriological cultures.
Results: PCR amplification of the targeted DNA fragment of Mycobacterium bovis was successful in 12.33% (37/300) of the bovine samples. Interestingly, 500-bp DNA fragment was also amplified in 6.67% (6/90) of the sputum indicating the possibility of zoonotic transmission. Rearing of livestock in household, unpasteurized milk consumption and smoking were identified as potential risk factors.
Conclusion: Results of the study may add value to bovine tuberculosis eradication campaigns to achieve the One Health initiative.

Keywords: Bovine tuberculosis; Molecular diagnosis; Zoonotic transmission.

1234. Pseudomonas Aeruginosa: Arsenal of Resistance Mechanisms, Decades of Changing Resistance Profiles, and Future Antimicrobial Therapies

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Antimicrobial resistance is one of the most serious public health issues facing humans since the discovery of antimicrobial agents. The frequent, prolonged, and uncontrolled use of antimicrobial agents are major factors in the emergence of antimicrobial-resistant bacterial strains, including multidrug-resistant variants. Pseudomonas aeruginosa is a leading cause of nosocomial infections. The abundant data on the increased resistance to antipseudomonal agents support the need for global action. There is a paucity of new classes of antibiotics active against P. aeruginosa. Here, we discuss recent antibacterial resistance profiles and mechanisms of resistance by P. aeruginosa. We also review future potential methods for controlling antibiotic-resistant bacteria, such as phage therapy, nanotechnology and antipseudomonal vaccines.

Keywords: Pseudomonas aeruginosa; Antibiotics; Antimicrobial; β-lactamases; Carbapenemases; Decoys; Efflux; Gold; Impermeability; Mechanisms; Multidrug; Nanoantimicrobial; Nanoparticles; Nanostars; Pandrug; Phage therapy; Polymersomes; Pumps; Resistance; Vaccines; Vecoys; Virus.

1235. Identification and Partial Characterization of Potential FtsL and FtsQ Homologs of Chlamydia

Scot P. Ouellette, Kelsey J. Rueden, Yasser M. Abd El-Rahman, JohnV.Cox and Robert J. Belland

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Chlamydia is amongst the rare bacteria that lack the critical cell division protein FtsZ. By annotation, Chlamydia also lacks several other essential cell division proteins including the FtsLBQ complex that links the early (e.g., FtsZ) and late (e.g., FtsI/Pbp3) components of the division machinery. Here, we report chlamydial FtsL and FtsQ homologs. Ct271 aligned well with Escherichia coli FtsL and shared sequence homology with it, including a predicted leucine-zipper like motif. Based on in silico modeling, we show that Ct764 has structural homology to FtsQ in spite of little sequence similarity. Importantly, ct271/ftsL and ct764/ftsQ are present within all sequenced chlamydial genomes and are expressed during the replicative phase of the chlamydial developmental cycle, two key characteristics for a chlamydial cell division gene. GFP-Ct764 localized to the division septum of dividing transformed chlamydiae, and, importantly, over-expression inhibited chlamydial development. Using a bacterial two-hybrid approach, we show that Ct764 interacted with other components of the chlamydial division apparatus. However, Ct764 was not capable of complementing an E. coli FtsQ depletion strain in spite of its ability to interact with many of the same division proteins as E. coli FtsQ, suggesting that chlamydial

FtsQ may function differently. We previously proposed that Chlamydia uses MreB and other rod-shape determining proteins as an alternative system for organizing the division site and its apparatus. Chlamydial FtsL and FtsQ homologs expand the number of identified chlamydial cell division proteins and suggest that Chlamydia has likely kept the late components of the division machinery while substituting the Mre system for the early components.

Keywords: Chlamydia; Bacterial two-hybrid system; Cell division; FtsL; FtsQ

1236. Multidimensional Metrics for Estimating Phage Abundance, Distribution, Gene Density, and Sequence Coverage in Metagenomes

Ramy K. Aziz, Bhakti Dwivedi, Sajia Akhter, Mya Breitbart and Robert A. Edwards

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Phages are the most abundant biological entities on Earth and play major ecological roles, yet the current sequenced phage genomes do not adequately represent their diversity, and little is known about the abundance and distribution of these sequenced genomes in nature. Although the study of phage ecology has benefited tremendously from the emergence of metagenomic sequencing, a systematic survey of phage genes and genomes in various ecosystems is still lacking, and fundamental questions about phage biology, lifestyle, and ecology remain unanswered. To address these questions and improve comparative analysis of phages in different metagenomes, we screened a core set of publicly available metagenomic samples for sequences related to completely sequenced phages using the web tool, Phage Eco-Locator. We then adopted and deployed an array of mathematical and statistical metrics for a multidimensional estimation of the abundance and distribution of phage genes and genomes in various ecosystems. Experiments using those metrics individually showed their usefulness in emphasizing the pervasive, yet uneven, distribution of known phage sequences in environmental metagenomes. Using these metrics in combination allowed us to resolve phage genomes into clusters that correlated with their genotypes and taxonomic classes as well as their ecological properties. We propose adding this set of metrics to current metaviromic analysis pipelines, where they can provide insight regarding phage mosaicism, habitat specificity, and evolution.

Keywords: Virus; Bacteriophage; Genomics; Metagenomics; Ecology.

1237. Model-Driven Discovery of Synergistic Inhibitors Against E. Coli and S. Enterica Serovar Typhimurium Targeting A Novel Synthetic Lethal Pair, aldA and prpC

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Mathematical models of biochemical networks form a cornerstone of bacterial systems biology. Inconsistencies between

simulation output and experimental data point to gaps in knowledge about the fundamental biology of the organism.

One such inconsistency centers on the gene aldA in Escherichia coli: it is essential in a computational model of E. coli metabolism, but experimentally it is not. Here, we reconcile this disparity by providing evidence that aldA and prpC form a synthetic lethal pair, as the double knockout could only be created through complementation with a plasmid-borne copy of aldA. Moreover, virtual and biological screening against the two proteins led to a set of compounds that inhibited the growth of E. coli and Salmonella enterica serovar Typhimurium synergistically at 100-200 µM individual concentrations. These results highlight the power of metabolic models to drive basic biological discovery and their potential use to discover new combination antibiotics.

Keywords: Synthetic lethality; Antibiotic development; Drug discovery; Systems biology; Metabolic reconstruction; Bacterial metabolism; Model-based drug target discovery; Pathway gap filling.

1238. Seroprevalence of Occult Hepatitis B Among Egyptian Paediatric Hepatitis C Cancer Patients

H.E. Raouf, A.S. Yassin, S.A. Megahed, M.S. Ashour and T.M. Mansour

Occult hepatitis B infection is characterized by the presence of hepatitis B virus (HBV) DNA in the serum in the absence of hepatitis B surface antigen (HBsAg). Prevalence of hepatitis C virus (HCV) infections in Egypt is among the highest in the world.

In this study, we aim at analysing the rates of occult HBV infections among HCV paediatric cancer patients in Egypt. The prevalence of occult HBV was assessed in two groups of paediatric cancer patients (HCV positive and HCV negative), in addition to a third group of paediatric noncancer patients, which was used as a general control.

All groups were negative for HBsAg and positive for HCV antibody. HBV DNA was detected by nested PCR and real-time PCR. HCV was detected by real-time PCR. Sequencing was carried out in order to determine HBV genotypes to all HBV patients as well as to detect any mutation that might be responsible for the occult phenotype. Occult hepatitis B infection was observed in neither the non-HCV paediatric cancer patients nor the paediatric noncancer patients but was found in 31% of the HCV-positive paediatric cancer patients.

All the detected HBV patients belonged to HBV genotype D, and mutations were found in the surface genome of HBV leading to occult HBV. Occult HBV infection seems to be relatively frequent in HCV-positive paediatric cancer patients, indicating that HBsAg negativity is not sufficient to completely exclude HBV infection.

These findings emphasize the importance of considering occult HBV infection in HCV-positive paediatric cancer patients especially in endemic areas as Egypt.

Keywords: Egypt; HBV; HCV; Cancer; Occult HBV; Paediatric.

1239. A Moraxella Catarrhalis Two-component Signal Transduction System Necessary for Growth in Liquid Media Affects Production of Two Lysozyme Inhibitors

Stephanie N. Joslin, Christine Pybus, Maria Labandeira-Rey, Amanda S. Evans, Ahmed S. Attia, Chad A. Brautigam, Eric J. Hansena and S. M. Payne

There are a paucity of data concerning gene products that could contribute to the ability of Moraxella catarrhalis to colonize the human nasopharynx. Inactivation of a gene (mesR) encoding a predicted response regulator of a two-component signal transduction system in M. catarrhalis yielded a mutant unable to grow in liquid media. This mesR mutant also exhibited increased sensitivity to certain stressors, including polymyxin B, SDS, and hydrogen peroxide. Inactivation of the gene (mesS) encoding the predicted cognate sensor (histidine) kinase yielded a mutant with the same inability to grow in liquid media as the mesR mutant. DNA microarray and real-time reverse transcriptase PCR analyses indicated that several genes previously shown to be involved in the ability of M. catarrhalis to persist in the chinchilla nasopharynx were upregulated in the mesR mutant. Two other open reading frames upregulated in the mesR mutant were shown to encode small proteins (LipA and LipB) that had amino acid sequence homology to bacterial adhesins and structural homology to bacterial lysozyme inhibitors. Inactivation of both lipA and lipB did not affect the ability of M. catarrhalis O35E to attach to a human bronchial epithelial cell line in vitro. Purified recombinant LipA and LipB fusion proteins were each shown to inhibit human lysozyme activity in vitro and in saliva. A lipA lipB deletion mutant was more sensitive than the wild-type parent strain to killing by human lysozyme in the presence of human apolactoferrin. This is the first report of the production of lysozyme inhibitors by M. catarrhalis.

Keywords: Moraxella catarrhalis; Lysozyme; Two-component system.

1240. Multiplexed Integrating Plasmids for Engineering of the Erythromycin Gene Cluster for Expression in Streptomyces spp. and Combinatorial Biosynthesis

Bahgat Fayed, David A. Ashford, Amal M. Hashem, Magdy A. Amin, Omaima N. El Gazayerly, Matthew A. Gregory and Margaret C. M. Smith

Bacteria in the genus Streptomyces and its close relatives are prolific producers of secondary metabolites with antibiotic activity. Genome sequencing of these bacteria has revealed a rich source of potentially new antibiotic pathways, whose products have never been observed. Moreover, these new pathways can provide novel genes that could be used in combinatorial biosynthesis approaches to generate unnatural analogues of existing antibiotics. We explore here the use of multiple orthologous integrating plasmid systems, based on the int/attP loci from phages TG1, SV1, and ϕBT1, to express the polyketide synthase (PKS) for erythromycin in a heterologous Streptomyces host. Streptomyces strains containing the three polyketide

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synthase genes eryAI, eryAII, and eryAIII expressed from three different integrated plasmids produced the aglycone intermediate, 6-deoxyerythronolide B (6-dEB). A further pair of integrating plasmids, both derived from the φC31 int/attP locus, were constructed carrying a gene cassette for glycosylation of the aglycone intermediates, with or without the tailoring gene, eryF, required for the synthesis of erythronolide B (EB). Liquid chromatography-mass spectrometry of the metabolites indicated the production of angolosaminyl-6-dEB and angolosaminyl-EB. The advantages of using multiplexed integrating plasmids for engineering expression and for combinatorial biosynthesis were demonstrated.

Keywords: Antibiotics; Plasmids; Erythromycin; Streptomyces.

1241. Immune Tolerance Elicited Via Unique Ocular and Oral Routes

H. M. Ashour

Current Molecular Medicine, 15(1): 78-81 (2015) IF: 3.621

Immune tolerance can be induced by numerous methods. This review article aims to draw lines of similarity and contrast between two unique models of immune tolerance, namely Anterior Chamber Associated Immune Deviation (ACAID) and Nickel-induced oral tolerance. ACAID is an immune tolerance model that leads to the generation of CD4$^+$ T regulatory cells and CD8$^+$ T regulatory cells in the periphery after the injection of an antigen into the anterior chamber of the eye. Nickel-induced oral tolerance is another immune tolerance model that is induced by the contact allergen Nickel and leads to the generation of Nickel-specific CD4$^+$ CD25$^+$ T regulatory cells after oral exposure. The goal of comparing different models of immune tolerance is to identify which mechanisms are universal and which mechanisms are model-specific. The knowledge of such mechanisms would allow scientists and clinicians to better intervene in different immune deregulation scenarios.

Keywords: Tolerance; Acaid; Nickel; Oral tolerance; T regulatory cells; Cytokines.

1242. Acinetobacter Baumannii Universal Stress Protein A Plays A Pivotal Role in Stress Response and is Essential for Pneumonia and Sepsis Pathogenesis

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Acinetobacter baumannii is one of the most significant threats to global public health. This threat iscompounded by the fact that A. baumannii is rapidly becoming resistant to all relevant antimicrobials. Identifying key microbial factors through which A. baumannii resists hostile host environmentis paramount to the development of novel antimicrobials targeting infections caused by this emerg-ing pathogen. An attractive target could be a molecule that plays a role in the pathogenesis and stressresponse of A. baumannii. Accordingly, the universal stress protein A (UspA) was chosen to be fully inves-tigated in this study. A platform of A. baumannii constructs, expressing various levels of the uspA generanging from zero to thirteen folds of wild-type level, and a recombinant E. coli strain, were employed toinvestigate the role of UspA in vitro stress and in vivo

pathogenesis. The UspA protein plays a significantrole in protecting A. baumannii from H2O2, low pH, and the respiratory toxin 2,4-DNP. A. baumannii UspAprotein plays an essential role in two of the deadliest types of infection caused by A. baumannii; pneumo-nia and sepsis. This distinguishes A. baumannii UspA from its closely related homolog, the Staphylococcusaureus Usp2, as well as from the less similar Burkholderia glumae Usps. Heterologous and overexpressionexperiments suggest that UspA mediates its role via an indirect mechanism. Our study highlights the roleof UspA as an important contributor to the A. baumannii stress and virulence machineries, and polishesit as a plausible target for new therapeutics.

Keywords: Acinetobacter baumannii; Stress' virulence.

1243. Contaminated Water as A Source of Helicobacter Pylori Infection: A Review

Ramy K. Aziz, Mohammed M. Khalifa and Radwa R. Sharaf

Journal of Advanced Research, 6: 539-547 (2015) IF: 3

Over the preceding years and to date, the definitive mode of human infection by Helicobacter pylori has remained largely unknown and has thus gained the interest of researchers around the world. Numerous studies investigated possible sources of transmission of this emerging carcinogenic pathogen that colonizes >50% of humans, in many of which contaminated water is mentioned as a major cause. The infection rate is especially higher in developing countries, where contaminated water, combined with social hardships and poor sanitary conditions, plays a key role. Judging from the growing global population and the changing climate, the rate is expected to rise. Here, we sum up the current views of the water transmission hypothesis, and we discuss its implications.

Keywords: Epidemiology; Infectious diseases; Climate change; Water crisis.

1244. Dissemination of VIM-2 Producing Pseudomonas Aeruginosa St233 At Tertiary Care Hospitals in Egypt

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Bmc Infectious Diseases, 12: (2015) IF: 2.613

Background: Pseudomonas aeruginosa is an important nosocomial pathogen, commonly causing infections in immunocompromised patients. The aim of this study was to examine the genetic relatedness of metallo-beta-lactamase (MBL) producing carbapenem resistant Pseudomonas aeruginosa clinical isolates collected from 2 tertiary hospitals in Cairo, Egypt using Multi Locus sequence typing (MLST).

Methods: Phenotypic and genotypic detection of metallo-beta-lactamase for forty eight non-duplicate carbapenem resistant P. aeruginosa isolates were carried out. DNA sequencing and MLST were done.

Results: The bla$_{VIM-2}$ gene was highly prevalent (28/33 strains, 85%) among 33 MBL-positive P.aeruginosa isolates. MLST revealed eleven distinct Sequence Types (STs). A unique ST233 clone producing VIM-2 was documented by MLST in P.aeruginosa strains isolated from Cairo university hospitals. The

high prevalence of VIM-2 producers was not due to the spread of a single clone.

Conclusions: The findings of the present study clearly demonstrate that clones of VIM-2 positive in our hospitals are different from those reported from European studies. Prevalence of VIM-2 producers of the same clone was detected from surgical specimens whereas oncology related specimens were showing diverse clones.

Keywords: Pseudomonas aeruginosa; Carbapenem resistance; bla$_{VIM-2}$; ST233; Egypt.

1245. Supermutators' Found Amongst Highly Levofloxacin-resistant E. Coli Isolates: A Rapid Protocol for the Detection of Mutation Sites

Ahmed Abd El-Fattah Zayed, Tamer Mohamed Essam, Abd El-Gawad Mohamed Hashem and Ossama Mohamed El-Tayeb

Fluoroquinolone resistance is gradually acquired through several mechanisms. In particular, chromosomal mutations in the genes encoding topoisomerases II and IV and increased expression of the multidrug efflux pump AcrAB-TolC are the most common mechanisms. In this study, multiplex polymerase chain reaction (PCR) protocols were designed for high-throughput sequencing of the quinolone resistance determining regions of topoisomerases genes (gyrA, parC and parE) and/or the expression regulation systems of multidrug efflux pump AcrAB (acrRAB, marRAB and soxSR). These protocols were applied to sequence samples from five subpopulations of 103 clinical Escherichia coli isolates. These subpopulations were classified according to their levofloxacin susceptibility pattern as follows: highly resistant (HR), resistant (R), intermediate (I), reduced susceptibility (RS) and susceptible (S). All HR isolates had mutations in the six genes surveyed, with two 'supermutator' isolates harboring 13 mutations in these six genes. Strong associations were observed between mutations in acrR and HR isolates, parE and R/HR isolates and parC and I/R/HR isolates, whereas surprisingly, gyrA mutations were common in RS/I/R/HR isolates. Further investigation revealed that strong associations were limited to the triple mutations gyrA-S83L/D87N/R237H and HR isolates and the double mutations S83L/D87N and I/R/HR isolates, whereas the single mutation S83L was common in RS/I/R/HR isolates. Interestingly, two novel mutations (gyrA-R237H and acrR-V29G) were located and found to strongly associate with HR isolates. To the best of our knowledge, the gyrA-R237H and acrR-V29G mutations have never been reported and require further investigation to determine their exact role in resistance or 'fitness' as defined by their ability to compensate for the organismal cost of gaining resistance.

Keywords: Acrab efflux pump; DNA gyrase; Multiplex PCR sequencing; Qrdr; Topoisomerase IV.

1246. Immune Response to Vi Polysaccharide, Heat-Killed Whole Cells, and Outer Membrane Protein of Salmonella Typhi

Alaa El-Din Shawky Hosny, Mohamed Reda Diab, Rania Abdelmonem Khattab and Heba Osama Awad

Introduction: Salmonella typhiVi capsular polysaccharide (ViCPS) is a licensed vaccine against typhoid fever in many countries; in Egypt, the killed whole-cell vaccine is still used. In this study, mice were used as an animal model to evaluate the immune response to ViCPS and other S. typhiantigens such as heat-killed whole cells and outer membrane protein (OMP).
Methodology: The three antigens were laboratory prepared, injected into mice groups, and the humoral response was evaluated using the indirect whole-cell enzyme-linked immunosorbent assay (ELISA). The sensitivity of this assay was investigated using in situ or pre-heated whole cells as coating antigens. In addition, the effect of the immunization route for ViCPS was examined.
Results: Immunizing doses of heat-killed whole cells as well as ViCPS, 2 and 4 µg given subcutaneously (SC) and 4 µg given intraperitoneally (IP), showed significant immune response compared to controls. However, the responses to these doses were not significantly different from each other. The OMP showed a higher significant response.
The sensitivity of indirect whole-cell ELISA was enhanced significantly by in situ heat treatment of the coating antigen rather than the pre-heated coating antigen.
Conclusions: The three antigens showed significant immune response. The immune response to OMP was higher. Though heat-killed whole cells and ViCPS are almost similar in immunizing level, ViCPS is recommended. The SC route was more immunizing than the IP one. Furthermore, the sensitivity of the indirect whole-cell ELISA technique could be enhanced by in situ heat inactivation of the coating cells.

Keywords: Salmonella typhi; Vi capsular polysaccharide; Outer membrane protein; Elisa; Immune response.

1247. Molecular Characterization of Enterococcus spp. Clinical Isolates from Cairo, Egypt

Y.A. Hashem, A.S. Yassin and M.A. Amin

Purpose: Enterococci are responsible for serious diseases such as bacteraemia, endocarditis and urinary tract infections.
The ability of enterococci to cause such diseases is due to acquisition of certain virulence factors such as haemolysin, gelatinase and enterococcus surface protein. This study has been conducted to investigate the occurrence of virulence factors and resistance to various antibiotics with emphasis on vancomycin in the Enterococcus spp.
Materials and Methods: Clinical specimens were collected and isolates were identified by proper microscopic, culture and biochemical tests. Susceptibility and degree of resistance of the isolates to various antibiotics were determined. Virulence factors were examined by phenotypic tests followed by molecular methods. Bioinformatics analysis was used to detect regions in the genomes that might have originated from horizontal gene transfer.
Result: The presence or absence of virulence genes did not affect the pattern of antimicrobial resistance in Enterococcus isolates; consequently, no relationship was found between virulence factors and resistance to different antibiotics used. Bioinformatics analysis showed that the virulence genes were mainly transferred by transposons.

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Conclusion: Among the enterococci, environmental factors may interfere in the expression of virulence factors. Horizontal gene transfer plays an important role in the spread of resistance and virulence genes.

Keywords: Enterococcus; Egypt; Resistance; Urinary tract infections; Virulence.

1248. Generation of Recombinant Bioluminescent Escherichia Coli for Quantitative Determination of Bacterial Adhesion

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Pakistan Journal of Pharmaceutical Sciences, 28 issue 4: 1301-1306 (2015) IF: 0.682

Bacterial adhesion to urinary catheter was evaluated by measuring the light emitted from a recombinant bioluminescent glycocalyx producer Escherichia coli strain. Generation of the bioluminescent strain was carried out by transforming the bacterial cells with pUCP18-GFP plasmid that contains a green fluorescence gene. Light emission measurement was closely correlated with the number of the adherent cells, giving a detectable signal from 1.2 X 102 cells.

The efficiency of this assay was confirmed by testing the antiadherent effect of subinhibitory concentrations of ciprofloxacin with the aid of a model for in-vitro catheter colonization. There was no significant difference in the percentage reduction of adherent cells obtained by both light emission measurement and viable cell count techniques.

Keywords: Recombinant bioluminescent E. coli, pUCP18-GFP plasmid; Adherence; Catheter colonization; Antiadherent effect.

1249. Laccase Production by Pleurotus Ostreatus and its Application in Synthesis of Gold Nanoparticles

Y. A. Hashem, A. S. Yassin and M. A. Amin

Biotechnology Reports, 5: 31-39 (2015)

In this work, the production of fungal laccase was optimized from local isolate of Pleurotus ostreatus using solid state fermentation. Factorial design was used to study the effect of several nutrients on enzyme production. Purification and characterization of the enzyme and the effect of temperature, pH and gamma radiation on fungal growth and enzyme production was investigated. Optimization of production conditions yielded an enzyme with activity over 32,450 IU/g of fermented substrate. Factorial design was capable of establishing the conditions that multiplied the activity of the enzyme several folds, consequently, reducing the cost of production.

The enzyme was capable of decolorizing several dyes with over 80% reduction in color confirming the aromatic degrading capability of laccase. The enzyme was also used in the synthesis of gold nanoparticles, proving that laccase from Pleurotus ostreatus has a strong potential in several industrial applications.

Keywords: Laccase; Pleurotus ostreatus; Gold nanoparticles (GNPS).

1250. Quality Control Testing for Tracking Endotoxin-Producing Gram-negative Bacteria During the Preparation of Polyvalent Snake Antivenom Immunoglobulin

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PDA Journal of Pharmaceutical Science and Technology, 69: 499-510 (2015)

nake bites represent a serious public health problem, particularly in rural areas worldwide. Antitoxic sera preparations are antibodies from immunized animals and are considered to be the only treatment option. The purification of antivenom antibodies should aim at obtaining products of consistent quality, safety, efficacy, and adherence to good manufacturing practice principles. Endotoxins are an integral component of the outer cell surface of Gram-negative bacteria. They are common contaminates of the raw materials and processing equipment used in the manufacturing of antivenoms. In this work, and as a part of quality control testing, we establish and examine an environmental monitoring program for identification of potential sources of endotoxin-producing Gram-negative bacteria throughout the whole steps of antivenom preparation. In addition, we follow all the steps of preparation starting from crude plasma till finished product using a validated sterility and endotoxin testing.Samples from air, surface, and personnel were collected and examined through various stages of manufacturing for the potential presence of Gram-negative bacteria. A validated sterility and endotoxin test was carried out in parallel at the different production steps. The results showed that air contributed to the majority of bacterial isolates detected (48.43%), followed by surfaces (37.5%) and then personnel (14%). The most common bacterial isolates detected were Achromobacter xylosoxidans, Ochrobactrum anthropi, and Pseudomonas aeruginosa, which together with Burkholderia cepacia were both also detected in cleaning water and certain equipment parts. A heavy bacterial growth with no fungal contamination was observed in all stages of antivenom manufacturing excluding the formulation stage. All samples were positive for endotoxin including the finished product.Implementation and continued evaluation of quality assurance and quality improvement programs in aseptic preparation is essential in ensuring the safety and quality of these products.

Keywords: Endotoxin; Pyrogen; Antivenom; Vaccine; Gram-negative.

1251. Enhanced Photocatalytic-biological Degradation of 2,4 Dichlorophenoxyacetic Acid

Reham Samir, Tamer Essam, Yasser Ragab and Abd El-gawad Hashem

Bulletin of Faculty of Pharmacy, Cairo University, 53: 77-82 (2015)

2,4-Dichlorophenoxyacetic acid (2,4-D) is the third most commonly used herbicide all over the world. There is a contradicted opinion about its toxicity and its half life in the environment. In this study the most effective method of its degradation and bioremediation has been studied. Two microbial consortia capable of utilizing 2,4-D as a sole source of carbon were isolated from the Egyptian environment. One of the

microbial consortia interestingly contained a certain kind of protozoa as one of the mixed consortia members. Degradation of 2,4-D by the microbial consortia was affected by 2,4-D initial concentration, agitation, pH of the medium and temperature. The two consortia were able to degrade up to 700 mg l^{-1} of 2,4-D. Pre-treatment with UV radiations in the presence of photocatalyst such as TiO$_2$ accelerates the biodegradation process. The toxic non biodegradable concentration of 2,4-D which was found to be the 800 mg l^{-1}, was degraded by pre-treatment with UV/TiO$_2$ and a subsequent microbial inoculation. The combined treatment proved to be an efficient mean of biodegradation and detoxification of toxic non biodegradable concentrations of 2,4-D.
Keywords: Sequential; Photo-catalysis; 2,4-D; Biodegradation; Bioremediation.

Dept. of Pharmaceutical Chemistry

1252. Design, Synthesis and Anticancer Activity of Furochromone and Benzofuran Derivatives Targeting VEGFR-2 Tyrosine Kinase

Omaima M. Abd El-Hafez, Hamed I. Ali, Kamelia M. Amin, Mohamed M. Abdallae and Eman Y. Ahmed

In continuation of our work concerning the relation between the anticancer and anti-vascular endothelial growth factor receptor (anti-VEGFR-2) activity of some synthesized compounds, we hereby designed and prepared three new series of furochromone and benzofuran derivatives (carbonitriles, sulfonyl hydrazides and imides). The prepared compounds were evaluated for their in vitro VEGFR-2 inhibitory activity, their cytotoxicity on fifteen human cancer cell lines and their in vivo antiprostate cancer activity.

The highest anti-VEGFR-2 activity was demonstrated by 6-acetyl-4-methoxy-7-methyl-5H-furo[3,2-g]chromen-5- one (3), which exhibited the same IC$_{50}$ value as the reference drug sorafenib (2.00 10^{-3} μM). On the other hand, most of the synthesized compounds showed potent cytotoxicity against most of the tested cell lines, in particular, the carbonitrile series (4a,b and 5a,d) which exhibited the best activity with IC50 values ranging from 3.56 10^{-13} to 4.89 10^{-7} μM. Moreover, the imide series (15–17) showed the most significant in vivo antiprostate cancer activity.

An in silico GOLD molecular docking study has been done to explore the binding mode of interaction of the furochromone and benzofuran derivatives to VEGFR-2 kinase, and to reveal the correlation between IC$_{50}$ (μM) of the enzymatic inhibition of VEGFR-2 kinase and the GoldScore fitness for further therapeutic application.
Keywords: Furochromone; Benzofuran; Anticancer; VEGFR-2.

1253. Synthesis, Bioassay, and QSAR Study of Bronchodilatory Active 4*H*-Pyrano[3,2-C]Pyridine-3-Carbonitriles

Adel S. Girgis, Dalia O. Saleh, Riham F. George, Aladdin M. Srour, Girinath G. Pillai Chandramukhi S. Panda and Alan R. Katritzky

A statistically significant QSAR model describing the bioactivity of bronchodilatory active 4H-pyrano[3,2- c]pyridine-3-carbonitriles (N= 41, n=8, R2= 0.824, R2 cv= 0.724, F= 18.749, s2= 0.0018) was obtained employing CODESSA-Pro software. The bronchodilatory active 4H-pyrano[3,2-c]pyridine-3-carbonitriles 17-57 were synthesized through a facile approach via reaction of 1-alkyl-4-piperidones 1-4 with ylidenemalononitriles 5-16 in methanol in the presence of sodium. The bronchodilation properties of 17-57 were investigated in vitro using isolated guinea pig tracheal rings pre-contracted with histamine(standard method) and compared with theophylline (standard reference). Most of the compounds synthesized exhibit promising bronchodilation properties especially, compounds 25 and 28.
Keywords: 4-Piperidone; Ylidenemalononitrile; 4H-pyrano[3,2-C]pyridine-3-carbonitrile; Bronchodilation; QSAR.

1254. Synthesis and Anticancer Activity of Some 8-Substituted-7-Methoxy- 2H-Chromen-2-One Derivatives Toward Hepatocellular Carcinoma HepG2 Cells

Kamilia M. Amin, Sahar M. Abou-Seri, Fadi M. Awadallah, Amal A.M. Eissa, Ghaneya S. Hassan and Mohamed M. Abdulla

Based on the reported anticancer activity of coumarin and pyrazoline derivatives, the present investigation dealt with the design and synthesis of coumarin derivatives bearing diversely substituted pyrazoline moieties 7e10. The non-cyclic isosteres 11aee of compounds 10aee were synthesized for comparative reasons. The target compounds were synthesized from 8-acetyl-7-methoxycoumarin that underwent ClaiseneSchmidt condensation with various aldehydes to give the chalcones 6aee, followed by reaction with hydrazine hydrate, phenyl hydrazine or semicarbazide under the appropriate conditions. Cytotoxicity of the synthesized compounds was evaluated in vitro against liver HepG2 cell line. Compounds were active in the nanomolar range. The most active compounds were investigated for their telomerase inhibition and proapoptotic activities.
Keywords: Coumarin; Pyrazoline; Telomerase inhibitor; Anticancer activity; Liver cancer.

1255. Ynthesis, Carbonic Anhydrase Inhibition and Cytotoxic Activity of Novel Chromone-based Sulfonamide Derivatives

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Four series of sulfonamides incorporating chromone moieties were synthesized and assessed for their cytotoxic activity against MCF-7 and A-549 cell lines, considering the fact that some of these tumors overexpress isoforms of carbonic anhydrase (CA, EC 4.2.1.1) which is inhibited by sulfonamides. Most new sulfonamides showed weak inhibitory activity against the offtarget, cytosolic isoforms hCA I, II but effectively inhibited the

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tumor-associated hCA IX and XII. The most active compounds featured a primary SO2NH2 group and were active in the low micromolar range against MCF-7 and A-549 cell lines. Compound 4a showed IC50 of 0.72 and 0.50 mM against MCF-7 and A-549 cell lines, respectively, and was further evaluated for its proapoptotic activity which proved enhanced in both tumor types.

Keywords: Chromone; Sulfonamide; Breast cancer; Lung cancer; Carbonic anhydrase.

1256. Design, Synthesis and Biological Evaluation of Novel Condensed Pyrrolo[1,2-C] Pyrimidines Featuring Morpholine Moiety as Pi3*ka* Inhibitors

Marwa A. Ibrahim, Sahar M. Abou-Seri, Mona M. Hanna, Mohamed M. Abdalla and Nehad A. El-Sayed

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Four series of condensed pyrrolo[1,2-c] pyrimidines 6a–d, 8a–d, 10a,b and 12a–e designed as PI3Ka inhibitors were synthesized and evaluated for inhibitory activity and selectivity toward different PI3K isoforms. The tested compounds displayed PI3Ka kinase inhibitory activity at either low micromolar or nanomolar level. In particular, the morpholino-pyrimidopyrrolo-pyrimidinones 8a–d and morpholino-pyridopyrrolopyrimidine-2-carbonitriles 12a–e proved to be highly potent and selective PI3K*a* inhibitors (IC50 = 0.1–7.7 nM). Moreover, the target compounds exhibited considerable cytotoxic activity against cervical cancer cell line HeLa that over-expresses p110a (0.21–1.99 μM). Molecular modeling simulation revealed that, the designed compounds docked well into p110a active site and their complexes are stabilized by a key H-bonding with the backbone amide of Val851 as well as other favorable hydrophobic and H-bond interactions with different amino acids within the enzyme active site.

Keywords: Pi3K inhibitor; Morpholino derivatives; Pyrimido[5,4-E] pyrrolo[1,2-C] pyrimidine; Pyrido[3,2-E]pyrrolo[1,2-C]Pyrimidine-2-Carbonitrile.

1257. Synthesis, Anticancer and Radiosensitizing Evaluation of Some Novel Sulfonamide Derivatives

Mostafa M. Ghorab, Fatma A. Ragab, Helmy I. Heiba, Marwa G. El-Gazzar and Sally S. Zahran

European Journal of Medicinal Chemistry, 92: 682-692 (2015) IF: 3.447

In this study, novel series of sulfonamide derivatives were synthesized starting from 2-cyanoacetyl) hydrazono)ethyl) phenyl) benzenesulfonamide 4a and 2-cyanoacetyl) hydrazono)ethyl) phenyl)-4- methylbenzenesulfonamide 4b. Different biologically active moieties as pyrazol, thiophene, pyridine and pyrimidines were introduced in order to investigate their in-vitro anticancer activity, in addition to a novel series of sulfonamide chalcones were synthesized from the reported 4-acetyl-N-(P-tolyl) benzenesulfonamide 3b. The newly synthesized sulfonamide derivatives were characterized by FT-IR, 1H NMR, 13C NMR, mass spectroscopy and elemental analyses and were tested for their in-vitro anticancer activity against human tumor liver cell line (HEPG-2). The most potent compounds in this

study were compounds 4a, 4b, 5a, 6a, 6b, 8, 9, 11, 13, 18 and 19 which showed higher activity than doxorubicin with IC50 ranging from 11.0 to 31.8 mM. Additionally, eight compounds among the most potent were evaluated for their ability to enhance the cell killing effect of g-radiation.

Keywords: Sulfonamide; Anticancer; Radiosensitizers.

1258. Isatin-pyrazole Benzenesulfonamide Hybrids Potently Inhibit Tumor-associated Carbonic Anhydrase Isoforms IX and XII

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European Journal of Medicinal Chemistry, 103: 583-593 (2015) IF: 3.447

New series of benzenesulfonamide derivatives incorporating pyrazole and isatin moieties were prepared using celecoxib as lead molecule. Biological evaluation of the target compounds was performed against the metalloenzyme carbonic anhydrase (CA, EC 4.2.1.1) and more precisely against the human isoforms hCA I, II (cytosolic), IX and XII (transmembrane, tumor-associated enzymes). Most of the tested compounds efficiently inhibited hCA I, II and IX, with K$_I$s of 2.5e102 nM, being more effective than the reference drug acetazolamide. Compounds 11e, 11f, 16e and 16f were found to inhibit hCA XII with Ki of 3.7, 6.5, 5.4 and 7.2 nM, respectively. Compounds 11e and 16e, with 5-NO$_2$ substitution on the isatin ring, were found to be selective inhibitors of hCA IX and hCA XII. Docking studies revealed that the NO$_2$ group of both compounds participate in interactions with Asp132 within the hCA IX active site, and with residues Lys67 and Asp130 in hCA XII, respectively.

Keywords: Isatin; Pyrazole; Sulfonamide; Carbonic anhydrase inhibitor; Molecular docking.

1259. Indoline Ureas as Potential Anti-hepatocellular Carcinoma Agents Targeting VEGFR-2: Synthesis, in Vitro Biological Evaluation and Molecular Docking

Wagdy M. Eldehna, Mohamed Fares, Hany S. Ibrahim, Mohamed H. Aly, Suher Zada, Mamdouh M. Ali, Sahar M. Abou-Seri, Hatem A. Abdel-Aziz and Dalal A. Abou El Ella

European Journal of Medicinal Chemistry, 100: 89-97 (2015) IF: 3.447

In our effort to develop potent and effective agents with anti-proliferative activity towards HepG2 hepatocellular carcinoma cells with potential inhibitory activity against VEGFR-2, a novel series of 1-(4-((2-oxoindolin-3-ylidene)amino)phenyl)-3-arylureas was designed and synthesized. All the newly prepared ureas 9a–x were evaluated in vitro for their anti-proliferative activity against HepG2 hepatocellular carcinoma cell line. Compounds 9a–c, 9e, 9f, 9j, 9m–o, 9t–v and 9x exhibited good activity against HepG2 cancer cells (IC$_{50}$ = 1.22 ± 0.11–8.37 ± 0.85 μM) comparable to that of doxorubicin and sorafinib (IC$_{50}$ = 2.90 ± 0.36 and 3.40 ± 0.25 μM, respectively). These thirteen compounds were further evaluated for their inhibitory activity against VEGFR-2. Compound 9x emerged as the most active

counterpart against VEGFR-2 with IC$_{50}$ value of 0.31 ± 0.04 μM. Furthermore, a molecular docking of the tested compounds was carried out in order to investigate their binding pattern with the prospective target, VEGFR-2 (PDB-code: 4ASD).

Keywords: Design; HepG2; Urea; VEGFR-2; Docking.

1260. Design and Synthesis of Potent 1,2,4-Trisubstituted Imidazolinone Derivatives With Dual p38*a*MAPK and ERK1/2Inhibitory Activity

Fadi M. Awadallah, Sahar M. Abou-Seri, Mohamed M. Abdulla and Hanan H. Georgey

The synthesis of new 1,2,4-trisubstituted imidazolinone derivatives was described. The new compounds were designed as dual p38aMAPK and ERK1/2 inhibitors through hybridization of pharmacophoric elements associated with inhibition of these kinases. The kinase inhibition assay revealed excellent activity in the nanomolar range; especially compounds 6d and 7h which seemed promising candidates for such dual activity with IC$_{50}$ values of 4.5 and 4.7 nM against p38*a*MAP, 25.0 and 24.0 nM against ERK1, and 3.2 and 3.5 nM against ERK2, respectively. These compounds were further tested for their antiproliferative activity against nine cancer cell lines, where they elicited high activity in the sub-micromolar range against breast, prostate and melanoma cells.

Keywords: Imidazolinones; Breast cancer; Melanoma; P38amapk; ERK1/2.

1261. Synthesis and DFT Studies of an Antitumor Active Spiro-oxindole

Adel S. Girgis, Ahmed F. Mabied, Jacek Stawinski, Lamees Hegazy,Riham F. George, Hanaa Farag, ElSayed M. Shalaby and I. S. Ahmed Farag

An anti-oncological active spiro-oxindole 7 was synthesized regioselectively via a [3+2]-cycloaddition reaction of azomethine ylide to exocyclic olefinic linkage of 4-piperidone 6, exhibiting properties against diverse tumor cell lines including leukemia, melanoma and cancers of the lung, colon, brain, ovary, breast, prostate, and kidney. Compound 7 crystallizes in the monoclinic system and P21/c space group with four molecules in the unit cell. The structure was also studied by AM1, PM3 and DFT techniques. DFT studies support the stereochemical selectivity of the reaction and determine the molecular electrostatic potential and frontier molecular orbitals.

Keywords: Piperidone; Spiropyrrolidine-oxindole; X-Ray; DFT; AM1; PM3; Antitumor.

1262. 4-Substituted-1-Phenyl-1H-Pyrazolo[3,4-D] Pyrimidine Derivatives: Design, Synthesis, Antitumor and EGFR Tyrosine Kinase Inhibitory Activity

Safinaz E.-S. Abbas, Enayat I. Aly, Fadi M. Awadallah and Walaa R. Mahmoud

Four series of some 4-substituted-1-phenyl-1H-pyrazol[3,4-d]pyrimidine derivatives 5a–f, 6a–f, 8a–f, and 9a–f were designed to be screened for their antitumor activity. All compounds were evaluated against breast (MCF-7) and lung (A-549) cell lines. Six compounds 5a, 5b, 6b, 6e, 9e, and 9f displaying activity against both cell lines were further estimated for their EGFR-TK inhibitory activity where they revealed 41–91% inhibition and compound 6b elicited the highest activity (91%). A docking study of these compounds into the ATP-binding site of EGFR-TK demonstrated their binding mode where H-bonding interaction with Met793 through N^1 of pyrimidine or N^2 of pyrazole was observed.

Keywords: Antitumor; EGFR-TK inhibition; Molecular modeling; Pyrazolo[3,4-D]pyrimidines; Synthesis.

1263. Synthesis, Anticonvulsant Activity and Molecular Modeling Study of Some New Hydrazinecarbothioamide, Benzenesulfonohydrazide, and Phenacylacetohydrazide Analogues of 4(3*H*)-Quinazolinone

Gehan Hegazy Hegazy

A new series of quinazoline analogues was designed and synthesized to get the target compounds 18–21, 30–41, 46–53, and 57–76. The Obtained compounds were evaluated for their anticonvulsant activity using PTZ and picrotoxin convulsive models. Compounds 47, 63, 68 and 73 proved to be the most active compounds in this study with a remarkable 100% protection against PTZ induced convulsions. Compounds 47, 63, 68 and 73 proved to be 10, 4, 4, and 5 fold more active, respectively than the used positive control sodium valproate. Structure activity correlation concluded valuable pharmacophoric information which confirmed by molecular modeling studies. Molecular docking study of 68 suggested its agonistic behavior toward GABAA receptor. The studied quinazoline analogues could be considered as useful templates for future development and further derivatization.

Keywords: Synthesis; 4(3*H*)-Quinazolinones; Anticonvulsant activity; Molecular modeling study.

1264. Synthesis and QSAR Study of Novel Anti-Inflammatory Active Mesalazine-metronidazole Conjugates

Roman N. Naumov, Siva S. Panda, Adel S. Girgis, Riham F. George, Michel Farhat and Alan R. Katritzky

Novel, mesalazine, metronidazole conjugates 6a–e with amino acid linkers were synthesized utilizing benzotriazole chemistry. Biological data acquired for all the novel bis-conjugates showed (a) some bisconjugates exhibit comparable anti-inflammatory activity with parent drugs and (b) the potent bis-conjugates show no visible stomach lesions. 3D-pharmacophore and 2D-QSAR modeling support the observed bio-properties.

Medicine Sector

Keywords: Mesalazine; Metronidazole; Conjugates; Amino acids; Anti-inflammatory; QSAR.

1265. Computer-Aided Identification of Novel Anticancer Compounds With A Possible Dual HER1/HER2 Inhibition Mechanism

Samia A. Elseginy, Glorianne Lazaro, Galal A. M. Nawwar, Kamilia M. Amin, Stephen Hiscox and Andrea Brancale

HER1 and HER2 are frequently overexpressed in human tumors where they drive cellular proliferation. For this reason they are considered important targets in anticancer therapy with dual HER1/HER2 inhibitors being recently approved and marketed. In this paper we report the identification of a series of compounds with anticancer activity by a combined virtual screening approach on the kinase domains of HER1 and HER2. 6 hit compounds that present a sub- or low-micromolar activity in two cell-based assays, were initially identified and a subsequent design cycle led to the synthesis of a compound with nanomolar activity in the cell-based assays.

Keywords: HER1 EGFR; HER2; Virtual screening structure-based drug; Design.

1266. Development and Validation of A Sensitive UHPLC-MS/MS Method for the Simultaneous Analysis of Tramadol, Dextromethorphan Chlorpheniramine and Their Major Metabolites in Human Plasma in for ensic Context: Application to Pharmacokinetics

Hala M. Heneedak, Ismail Salama, Samia Mostafa, Ehab EL-Kady and Mohamed El-Sadek

The prerequisites for forensic confirmatory analysis by LC/MS/MS with respect to European Union guidelines are chromatographic separation, a minimum number of two MS/MS transitions to obtain the required identification points and predefined thresholds for the variability of the relative intensities of the MS/MS transitions (MRM transitions) in samples and reference standards. In the present study, a fast, sensitive and robust method to quantify tramadol, chlorpheniramine, dextromethorphan and their major metabolites, O-desmethyltramadol, dsmethyl-chlorpheniramine and dextrophan, respectively, in human plasma using ibuprofen as internal standard (IS) is described. The analytes and the IS were extracted from plasma by a liquid-liquid extraction method using ethyl acetate-diethyl-ether (1:1). Extracted samples were analyzed by ultra-high-performance liquid chromatography coupled to electrospray ionization tandem mass spectrometry (UHPLC-ESI-MS/MS). Chromatographic separation was performed by pumping the mobile phase containing acetonitrile, water and formic acid (89.2:11.7:0.1) for 2.0 min at a flow rate of 0.25 µL/min into a Hypersil-Gold C_{18} column, 20×2.0 mm (1.9 µm) from Thermoscientific, New York, USA. The calibration curve was linear for the six analytes. The intraday precision (RSD) and accuracy (RE) of the method were 3-9.8 and -1.7-4.5%,

respectively. The analytical procedure herein described was used to assess the pharmacokinetics of the analytes in 24 healthy volunteers after a single oral dose containing 50 mg of tramadol hydrochloride, 3 mg chlorpheniramine maleate and 15 mg of dextromethorphan hydrobromide.

Keywords: Tramadol; Dextromethorphan; Chlorpheniramine; LC-MS/MS; Plasma.

1267. Synthesis and Anticonvulsant Activity of Substituted-1,3- Diazaspiro[4.5]Decan-4-Ones

Mohamed Nabil Aboul-Enein, Aida Abdel Sattar El-Azzouny, Ola Ahmed Saleh, Kamilia Mahmoud Amin, Yousreya Ali Maklad and Rasha Mohamed Hassan

A series of novel spiroimidazolidinone derivatives 6a–d and 8a–x were synthesized and biologically evaluated for their anticonvulsant activity in the maximal electroshock seizure (MES) assay and the subcutaneous pentylenetetrazole (scPTZ) screening test.

Compound 8w was the most active derivative in the scPTZ screening test with an ED50 value by about 5- and 83.6-fold lower than those of phenobarbital and ethosuximide as reference drugs, respectively. Most of the tested compounds exhibited moderate to weak activity in the MES screen test, except for 8a which displayed 100% protection at 0.09 mmol/kg. Moreover, all the test compounds did not show any minimal motor impairment in the neurotoxicity test.

Keywords: Anticonvulsants; 1,3-Diazaspiro[4.5]Decan-4-ones; Epilepsy.

1268. Design, Synthesis and in Vitro Antiproliferative Activity of Novel Isatin-quinazoline Hybrids

Mohamed Fares, Wagdy M. Eldehna, and Sahar M. Abou-Seri, Hatem A. Abdel-Aziz, Mohamed H. Aly and Mai F. Tolba

Using a molecular hybridization approach, a new series of isatin-quinazoline hybrids 15a–o was designed and synthesized via two different synthetic routes.

The target compounds 15a–o were prepared by the reaction of quinazoline hydrazines 12a–e with indoline-2,3-diones 13a–c or by treating 4-chloroquinazoline derivatives 11a–e with isatin hydrazones 14a–c.

The in vitro anticancer activity of the newly synthesized hybrids was evaluated against the liver HepG2, breast MCF-7 and colon HT-29 cancer cell lines. A distinctive selective growth inhibitory effect was observed towards the HepG2 cancer cell line. Compounds 15b, 15g and 15l displayed the highest potency, with IC_{50} values ranging from 1.0 ± 0.2 to 2.4 ± 0.4 µM, and they were able to induce apoptosis in HepG2 cells, as evidenced by enhanced expression of the pro-apoptotic protein Bax and reduced expression of the anti-apoptotic protein Bcl-2, in addition to increased caspase-3 levels

Keywords: Antiproliferative activity; Isatins; Molecular Hybridization; Quinazolines.

1269. Simultaneous Determination of Aliskiren Hemifumarate, Amlodipine Besylate and Hydrochlorothiazide in Spiked Human Plasma Using UPLC-MS/MS

Walid M. Ebeid, Ehab F. Elkady, Asmaa A. El-Zaher, Ramzia I. El-Bagary and Gabor Patonay

A sensitive UPLC-MS/MS method was developed and validated for simultaneous estimation of aliskiren hemifumarate (ALS), amlodipine besylate (AML) and hydrochlorothiazide (HCZ) in spiked human plasma using valsartan as an internal standard (IS). Liquid–liquid extraction was used for purification and pre-concentration of analytes. The mobile phase consisted of 0.1% formic acid in ammonium acetate buffer (0.02 M, pH 3.5) and methanol (25:75, v/v), flowing through XBridge BEH (50 3 2.1 mm ID, 5 mm) C18 column, at a flow rate of 0.6 mL min21. Multiple reaction monitoring (MRM) transitions were measured using an electrospray source in the positive ion mode for ALS and AML, whereas HCZ and IS were measured in negative ion mode. Validation of the method was performed as per US-FDA guidelines with linearity in the range of 2.0–400.0, 0.3–25.0 and 5.0–400.0 ng mL^{-1} for ALS, AML and HCZ, respectively. In human plasma, ALS, AML and HCZ were stable for at least 1 month at 270+5˚C and for at least 6 h at ambient temperature. After extraction from plasma, the reconstituted samples of ALS, AML and HCZ were stable in the autosampler at ambient temperature for 6 h. The LC-MS/MS method is suitable for bioequivalence and pharmacokinetic studies of this combination.
Keywords: Aliskiren hemifumarate; Amlodipine besylate and hydrochlorothiazide; UPLC-MS/MS.

1270. An Eco-Friendly Direct Injection HPLC Method for Methyldopa Determination in Serum by Mixed-mode Chromatography using A Single Protein-coated Column

Samy Emara, Tsutomu Masujima, Walaa Zarad, Maha Kamal, Marwa Fouad and Ramzia El-Bagary

A simple, rapid and environment-friendly direct injection HPLC method for the determination of methyldopa (MTD) in human serum has been developed and validated. The method was based on cleanup and separation of MTD from serum by mixed-mode liquid chromatography using a single protein-coated TSK gel ODS-80 TM analytical column (50 3 4.0 mm i.d., 5 mm). The protein-coated column exhibited excellent resolution, selectivity and functioned in two chromatographic modes: size-exclusion chromatography [i.e., solid-phase extraction (SPE) for serum proteins] and reversed-phase chromatography for the final separation of MTD. SPE and HPLC separation were carried out simultaneously with a green mobile phase consisting of acetate buffer (0.1 M, pH 2.4) at a flow rate of 1 mL/min and at room temperature (23±1˚C). The eluent was monitored at emission and excitation wavelengths of 320 and 270 nm, respectively. A calibration curve was linear over the range of 0.1–30 μg/mL with a detection limit of 0.027 μg/mL. This online SPE method was successfully applied to real samples obtained from patients receiving MTD therapy.
Keywords: Methyl dopa; Serum; Mixed-mode chromatography; Protein coated column.

1271. Synthesis, Anti-inflammatory and Antinociceptive Activity of Some Novel Benzothiazole Derivatives

Eman M. H. Abbas, Kamelia M. Amin,Wageeh S. El-Hamouly, Dina H. Dawood and Mohamed M. Abdalla

A new series of derivatives bearing benzothiazol-2-one or benzothiazole ring system conjugated to other different heterocycles were prepared using 5,6-dimethoxy-3-benzothiazol-2(3H)-one (1) as a starting material. The structures of the newly synthesized products have been established based on analytical and spectral data. In addition, the anti-inflammatory and antinociceptive activities of some of the products were evaluated. Our data showed that many derivatives have promising activities as anti-inflammatory and antinocicepative agents.
Keywords: Benzothiazol-2-one; Benzothiazole; Anti-inflammatory; Antinocicepative.

1272. Validated HPLC and Ultra-HPLC Methods for Determination of Dronedarone and Amiodarone– Application for Counterfeit Drug Analysis

Ramzia I. El-Bagary and Ehab F. Elkady, Shereen Mowaka and Maria A. Attallah

Two simple, accurate, and precise chromatographic methods have been developed and validated for the determination of dronedarone (DRO) HCl and amiodarone (AMI) HCl either alone or in binary mixtures due to the possibility of using AMI as a counterfeit of DRO because of its lower price. First, an RP-HPLC method is described for the simultaneous determination of DRO and AMI. Chromatographic separation was achieved on a BDS Hypersil C18 column (150 × 4.6 mm, 5 μm). Isocratic elution based on potassium dihydrogen phosphate buffer with 0.1% triethylamine pH 6–methanol (10 + 90, v/v) at a flow rate of 2 mL/min with UV detection at 254 nm was performed. The second method is RP ultra-HPLC in which the chromatographic separation was achieved on an Acclaim^{TM} RSLC 120 C18 column (100 × 2.1 mm, 2.2 μm) using isocratic elution with potassium dihydrogen phosphate buffer with 0.1% triethylamine pH 6–methanol (5 + 95, v/v) at a flow rate of 1 mL/min with UV detection at 254 nm. Linearity, accuracy, and precision of the two methods were found to be acceptable over the concentration ranges of 5–80 μg/mL for both DRO and AMI. The results were statistically compared using one-way analysis of variance. The optimized methods were validated and proved to be specific, robust, precise, and accurate for the QC of the drugs in their pharmaceutical preparations.
Keywords: Dronedarone; Amiodarone; Reversed-phase high performance liquid chromatography; Reversed-phase ultra performance liquid chromatography: Pharmaceutical preparation; Counterfeits.

Medicine Sector

1273. Simultaneous Determination of Valsartan, Amlodipine Besylate and Hydrochlorothiazide Using Capillary Zone Electrophoresis (CZE)

W. Ebeid, M. Salim, E. Elkady, A. Elzahr, R. El-Bagary and G. Patonay

A capillary zone electrophoresis method was developed for the simultaneous determination of valsartan (VAL), amlodipine besylate (AML) and hydrochlorothiazide (HCZ) in their combined tablets. Separation was achieved on a fused silica capillary by applying a potential of 15 kV (positive polarity) and a running background electrolyte containing 40mM phosphate buffer at pH 7.5 with UV detection at 230 nm. The samples were injected hydrodynamically for 3 s at 0.5 psi and the temperature of the capillary cartridge was kept at 25 ˚C. Pyrazinoic acid was used as an internal standard. The method was validated according to ICH guidelines regarding specificity, linearity, limits of detection and quantitation, accuracy and precision, (Supplementary materials, Table S2). The method showed satisfactory linearity in the ranges of 10-200, 2-20 and 2-20 µg mL^{-1} with LODs of 1.82, 0.39, 0.65 µg mL^{-1} and LOQs of 5.51, 1.17, 1.96 µg mL^{-1} for VAL, AML and HCZ, respectively. The proposed method was successfully applied for the analysis of the studied drugs in their laboratory prepared mixtures and co-formulated tablets. The results were compared with reported methods and no significant differences were found. The proposed method can be used for quality control of the cited drugs in ordinary laboratories.
Keywords: Valsartan; Amlodipine besylate; Hydrochlorothiazide; Capillary zone electrophoresis.

1274. Ultra High Performance Liquid Chromatography Method for the Determination of Two Recently FDA Approved TKIs in Human Plasma using Diode Array Detection

Marwa Fouad, Maxime Helvenstein and Bertrand Blankert

Generally, tyrosine kinase inhibitors have narrow therapeutic window and large interpatient variability compared to intrapatient variability. In order to support its therapeutic drug monitoring, two fast and accurate methods were developed for the determination of recently FDA approved anticancer tyrosine kinase inhibitors, afatinib and ibrutinib, in human plasma using ultra high performance liquid chromatography coupled to PDA detection. Diclofenac sodium was used as internal standard. The chromatographic separation was achieved on an Acquity UPLC BEH C18 analytical column using a mobile phase combining ammonium formate buffer and acetonitrile at a constant flow rate of 0.4 mL/min using gradient elution mode. A µSPE (solid phase extraction) procedure, using Oasis MCX µElution plates, was processed and it gave satisfying and reproducible results in terms of extraction yields. Additionally, the methods were successfully validated using the accuracy profiles approach (β= 95% and acceptance limits = ±15%) over the ranges 5–250 ng/mL for afatinib and from 5 to 400 ng/mL for ibrutinib in human plasma.
Keywords: Afatinib; Ibrutinib; Accuracy profiles; MSPE; UPLC; Tyrosine kinase inhibitors.

1275. Preparation and Characterization of Two New forced Degradation Products of Letrozole and Development of A Stability-Indicating RP-LC Method for its Determination

Ehab Farouk Elkady and Marwa Ahmed Fouad

Two new hydrolytic products of letrozole were identified and proved to be true degradation products obtained by alkaline and acidic degradation of the drug. The acid and amide forms of the nitrile groups of letrozole were prepared and identified by IR and mass spectroscopic techniques. Subsequently, a simple, precise and selective stability-indicating RPLC method was developed and validated for the determination of letrozole in the presence of its degradation products. Letrozole was subjected to alkali and acid hydrolysis, oxidation, thermal degradation and photo-degradation. The degradation products were well isolated from letrozole. The chromatographic method was achieved usinggradient elution of the drug and its degradation products on a reversed phase Zorbax Eclipse C18 column (100mm x 4.6mm, 3.5µm) using a mobile phase consisting of 0.01M KH$_2$PO$_4$ and methanol at a flow rate of 1mL min^{-1}. Quantitation was achieved with UV detection at 230nm. Linearity, accuracy and precision were found to be acceptable over the concentration range of 0.01-80µgmL^{-1}. The proposed method was successfully applied to the determination of letrozole in bulk, plasma and in its pharmaceutical preparation.
Keywords: Letrozole; Reversed-phase Liquid chromatography; Stability-indicating assay; Forced degradation; Aromatase inhibitor.

1276. A Combination of Isocratic and Gradient Elution Modes in HPLC With the Aid of Time-Overlapping Process for Rapid Determination of Methyldopa in Human Urine

Samy Emara, Tsutomu Masujima, Walaa Zarad, Maha Kamal, Marwa Fouad and Ramzia El-Bagary

A new rapid time-overlapping high-performance liquid chromatography method using coupled-column double-injection technique with fluorescence detection has been developed and validated to determine methyldopa (MTD) in human urine. The method was based on injecting a new sample onto the second column before finalizing the cleanup and the re-equilibration of the first column for the former sample. A combination of isocratic and gradient elution was employed according to a pre-set program. At the beginning, isocratic step of acetate buffer solution (0.1 M, pH 2.4) was set until 7 min. Subsequently, a gradient elution step using acetate buffer (0.1 M, pH 2.4) as mobile phase A and acetonitrile as mobile phase B was employed. After the end of each gradient step, the column was re-equilibrated with 4mL of the starting isocratic elution system before the next analysis. The overall cycle time was 7 min per each sample. The calibration curve was linear over the concentration range of 0.1–40 µg=mL MTD. The overall mean recoveries were in the range of 98.29–101.39%. The applicability

of the method was successfully evaluated by monitoring the incremental urinary excretion of MTD in human urine over 12 hr after a single oral administration of 250 mg.

Keywords: Coupled-column; Double injection; Fluorescence detection; HPLC; Methyldopa; Mixed elution modes.

Dept. of Pharmaceutical Organic Chemistry

1277. Synthesis, Anticancer Activity and Effects on Cell Cycle Profile and Apoptosis of Novel Thieno[2,3-D]Pyrimidine and Thieno[3,2-E] Triazolo[4,3-C]Pyrimidine Derivatives

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Motivated by the widely reported anticancer activity of thieno[2,3-d]pyrimidines a series of 24 new 2-substitutedhexahydrocycloocta[4,5] thieno[2,3-d]pyrimidines with different substituents at C-4 position and hexahydrocycloocta[4,5]thieno[3,2-e]-1,2,4-triazolo[4,3-c]pyrimidines were synthesized. The anticancer activity of 17 compounds were evaluated by National Cancer Institute (USA) using a two stage process utilizing 59 different human tumor cell lines representing leukemia, melanoma, cancers of lung, colon, central nervous system (CNS), ovary, kidney, prostate as well as breast. Compound 9c showed broad spectrum potent anticancer activity in nano molar to micro molar range against 56 human tumor cell lines with GI50 less than 10 μM ranging from 0.495 to 5.57 μM, also it is worth mentioning that compound 9c had the marked highest selectivity against the two cell lines T-47D and MDA-MB-468 belonging to breast cancer with GI50 = 0.495 and 0.568 μM respectively, and its effect was further studied on cell cycle progression and induction of apoptosis in the MDA-MB-468 cell line.

Results: showed that compound 9c induced cell cycle arrest at G2/M phase and also, showed accumulation of cells in pre-G1 phase which may result from, degradation or fragmentation of the genetic materials indicating a possible role of apoptosis in compound 9c-induced cancer cell death and cytotoxicity and verifying this compound as promising selective anticancer lead. Compound 6c was selective against K-562, SR and MOLT-4 cell lines belonging to leukemia showing growth inhibition percentages 86.38, 65.76 and 60.40 at a single dose test, at the same time it showed lethal activity against HOP-92 representing non-small cell lung cancer. Interestingly, leukemia SR, CNS cancer SNB-75 and renal cancer UO-31 cell lines proved to be sensitive to compound 6d with growth inhibition percentages 52.86, 50.94 and 53.99 respectively. Additionally, compound 6d demonstrated lethal activity to HOP-92 belonging non-small cell lung cancer.

Keywords: Thieno[2,3-D]pyrimidines; Thieno[3,2-E]-1,2,4-Triazolo[4,3-C]Pyrimidines; Synthesis; Anticancer activity; Cell cycle arrest profile; Apoptosis.

1278. Useful Four-carbon Synthons En Route to Monastrol Analogs

Amr M. Abdou, S. Botros, Rasha A. Hassan, Mona M. Kamel, Douglass F. Taber and Azza T. Taher

Tetrahedron, 71: 139-146 (2015) IF: 2.641

A simple protocol has been established for the preparation of a family of crystalline N-aryl γ-hydroxycrotonamides, useful four-carbon synthons.

These were further elaborated to analogs of monastrol having variant ester sidechains, that were evaluated for their anticancer activity employing the NCI 60 cell line panel.

Keywords: Monastrol analogs; Ester exchange; Biginelli; Anti-cancer activity.

1279. Synthesis and Antitumor Activity of Tetrahydrocarbazole Hybridized With Dithioate Derivatives

Hala Bakr El-Nassan

Journal of Enzyme Inhibition and Medicinal Chemistry, 30: 308-315 (2015) IF: 2.332

The present study reported the synthesis of tetrahydrocarbazoles hybridized with dithioate derivatives. Three series were synthesized namely alkyl dithiocarbonates (4a–d), heterocyclic dithiocarbamates (6a–g) and dialkyl dithiocarbamate (7). The synthesized compounds were tested in vitro on human breast adenocarcinoma cell line (MCF7) and the human colon tumor cell line (HCT116). Most of the synthesized compounds exploited potent antitumor activity, especially compound 6f [4-chlorophenylpiperazine derivative], which showed cytotoxic activity against MCF7 superior to doxorubicin with IC$_{50}$ value of 7.24 nM/mL.

Keywords: Antitumor Activity, Dithiocarbamates, HCT116, MCF7, Tetrahydrocarbazole

1280. Design, Synthesis, and Antitumor Activity of Novel 5-Pyridyl-1,3,4- Oxadiazole Derivatives Against the Breast Cancer Cell Line MCF-7

Nadia Abdalla Khalil, Aliaa Moh Kamal and Soha Hussein Emam

Biological and Pharmaceutical Bulletin, 38: 763-773 (2015) IF: 1.828

Various 1,3,4-oxadiazole-2-thiol derivatives have considerable potential in the field of antitumor activity.

On the basis of the structure of the highly active reported oxadiazole analogues, 36 novel compounds were designed. Their molecular transport properties were predicted using a computer-aided program, and they were then synthesized and tested for anticancer activity against the breast cancer cell line MCF-7. Most of the tested compounds showed excellent to potent cytotoxic activity.

Docking studies were carried out to examine the possibilities of the target compounds to become lead compounds in the future after more biological investigations. Compounds 18 and 22 were more active than the reference drug with IC50 values of 0.010 μM and 0.012 μM, respectively, and binding energy scores of -10.32 and 10.25, respectively.

Keywords: 1,3,4-Oxadiazole; Synthesis; Cytotoxic activity; Pharmacokinetic parameter; Docking study.

Medicine Sector

1281. Synthesis and Anticancer Activity of Novel Tetrahydroquinoline and Tetrahydropyrimidoquinoline Derivatives

Ehab M. Gedawy, Asmaa E. Kassab and Afaf A. El-Malah

Medicinal Chemistry Research, 24: 3387-3397 (2015) IF: 1.402

A series of new tetrahydroquinolines with different substituents at C-2 and C-4 positions in addition to several tetrahydropyrimidoquinolin-4-amines and tetrahydropyrimidoquinoline- 2,4-diamines were synthesized. The in vitro anticancer activity of all newly synthesized compounds was tested against human colon carcinoma (HCT116) and human breast adenocarcinoma (MCF7) cell lines. Seven compounds 1a, 5a, 5b, 6a, 6b, 7a and 7b showed potent anticancer activity against both HCT116 and MCF7 cell lines with IC_{50} between 16.33 and 34.28 μM. All these compounds were more potent than imatinib (IC_{50} = 34.40 μM) and tamoxifen (IC_{50} = 34.30 μM). Compound 7b was the most active against HCT116 cell line with 2.1-fold more potent antitumor activity than imatinib. Also, compounds 1a, 5b and 6a exhibited the highest anticancer activity against MCF7 cell line, having two- to 1.79-fold more potent anticancer activity than tamoxifen.

Keywords: Tetrahydroquinolines; Tetrahydropyrimidoquinolin-4-amines; Tetrahydropyrimidoquinoline-2,4-diamines; Synthesis; Anticancer activity.

1282. Synthesis and Anticancer Evaluation of 1,3,4-Oxadiazoles, 1,3,4-Thiadiazoles, 1,2,4-Triazoles and Mannich Bases

Nadia Youssef Megally Abdo and Mona Monir Kamel

Chemical and Pharmaceutical Bulletin, Japan, 63: 369-376 (2015) IF: 1.164

A series of 5-(pyridin-4-yl)-N-substituted-1,3,4-oxadiazol-2-amines (3a–d), 5-(pyridin-4-yl)-N-substituted-1,3,4-thiadiazol-2-amines (4a–d) and 5-(pyridin-4-yl)-4-substituted-1,2,4-triazole-3-thiones (5a–d) were obtained by the cyclization of hydrazinecarbothioamide derivatives 2a–d derived from isonicotinic acid hydrazide. Aminoalkylation of compounds 5a–d with formaldehyde and various secondary amines furnished the Mannich bases 6a–p. The structures of the newly synthesized compounds were confirmed on the basis of their spectral data and elemental analyses. All the compounds were screened for their in vitro anticancer activity against six human cancer cell lines and normal fibroblast cells. Sixteen of the tested compounds exhibited significant cytotoxicity against most cell lines. Among these derivatives, the Mannich bases 6j, 6m and 6p were found to exhibit the most potent activity. The Mannich base 6m showed more potent cytotoxic activity against gastric cancer NUGC (IC_{50}=0.021μM) than the standard CHS 828 (IC_{50}=0.025μM). Normal fibroblast cells WI38 were affected to a much lesser extent (IC_{50}>10μM).

Keywords: Anticancer activity; Mannich base; 1,2,4-Triazole; 1,3,4-Oxadiazole, 1,3,4-Thiadiazole; Isonicotinic acid hydrazide.

1283. Convenient Synthesis, Characterization, Cytotoxicity and Toxicity of Pyrazole Derivatives

Mona M. Kamel

Acta Chimica Slovenica, 62: 136-151 (2015) IF: 0.686

3-Methyl-1H-pyrazol-5(4H)-one (1) was used as a template to develop new anticancer compounds and investigate their SAR. The ring modification of compound 1 occurred through its reaction with aromatic aldehydes and different reagents to afford the corresponding 6-oxopyrano[2,3-c]pyrazoles4a-c and their amino analogues 6-aminopyrano[2,3-c]pyrazoles6a-c, 8; the pyrazolopyrano[2,3-b]pyridines 10a-c and the chromenopyrano[2,3-c]pyrzolones13, 14. The reaction of compound 1 with thiourea and appropriate aromatic aldehydes afforded the pyrazolo[3,4-d]pyrimidine derivatives 17a-c. On the other hand, the pyrazolo[3,4-d]thiazole derivatives 22a-d were obtained via the reaction of 1 with sulpher and aryl isothiocyanates in presence of triethylamine. The reaction of compound 1 with phenylisothiocyanate followed by treatment with the a-halocarbonyl compounds 24a-c afforded the thiazole derivatives 25a-c. The synthesized products were evaluated for their cytotoxicity against cancer and normal cell lines. Most compounds showed significant anticancer activity without affecting the normal fibroblast cells. The toxicity of the mostpontent cytotoxic compounds was measured using Brine-Shrimp Lethality Assay

Keywords: Pyrazole; Pyrano[2,3-C]pyrazole; Pyrazolo[3,4-D]pyrimidine; Pyrazolo[3,4-D]thiazole; Cytotoxicity.

1284. A Simple and Convenient Synthesis of Novel Thiopyrimidine Derivatives as Anticancer Agents

Afaf K. E. El-Ansary, Neama A. Mohamed, Khaled O. Mohamed, Hend M. W. Abd El-fattah and Mai El-Manawaty

Research Journal of Pharmaceutical, Biological and Chemical Sciences, 6(4): 1745-1752 (2015)

The starting thiopyrimidine carbonitrile derivatives 1a, b were synthesized via the reaction of phenylthiourea, ethylcyanoacetate and appropriate aromatic aldehydes namely 2-thiophenaldehyde and verateraldehyde. Chlorination of compounds 1a,b by phosphorus oxychloride and phosphorus pentachloride gave compounds 2a, b, which were subjected to react with anthranilic acid, glycine and sodium azide afforded compounds 3a, b ,4a, b and 5a, b respectively. While reaction of compounds 2a, b with some aromatic amines or hydrazine hydrate furnished compounds 6a-d and 7a, b respectively. Structures of all synthesized compounds were elucidate using IR, ^{1}H-NMR and Mass spectroscopes. Some of the newly synthesized analogues were chosen to evaluate their in-vitro cytotoxic activity against human liver carcinoma cell lines (HEPG2), human breast mammary gland adenocarcinoma cell lines (MCF7), prostate cancer (PC3). The obtained data revealed that some of the tested derivatives especially 6d has high potency against MCF7, while on the other hand it has good activity against PC3, while 3a and 6b exhibited good activity against MCF7 and HepG2 respectively, on the other hand, 1a have moderate activity against MCF7.

Keywords: Thiopyrimidin; HEPG2; MCF7; PC3; Cytotoxic activity.

1285. Synthesis and Antimicrobial Evaluation of Some New Dihydropyrimidine Derivatives

Ashraf M. Hamouda and Khaled O. Mohamed

Der Pharma Chemica, 7(6): 116-125 (2015)

By the application of Beginili conditions, a new series of 1-substituted and 1-unsubstituted of 5-cyano-2-thiouracil 1(a-h) derivatives were synthesized and evaluated for their antimicrobial activities. Reacting our main taut omeric target compound 6-(benzo[b]thiophen-2-yl)-4-oxo-2-thioxo-1,2,3,4-tetrahydro-pyrimidine -5-carbonitrile (1a) with methyl iodide gave the dimethyl derivative 2 . Hydrazinolysis of compound 2 yielded the hydrazino compound 3, which was converted to the corresponding pyrazole derivatives 4 (a,b) by reacting with1-(4-bromophenyl)-3-(4- bromo or 4-fluorophenyl) prop-2-en-1-one. A series of azomethine compounds 6 (a-d) were obtained by reacting the hydrazino compound 5 with different aromatic aldehydes, which was obtained by hydrazinolysis of compound 1a with hydrazine hydrate. All the compounds were characterized by physical and spectral data. The compou nds were screened for anti-microbial activity.

Keywords: Tetrahydropyrimidines; Hydrazino; Pyrazole; Azomethine; Antimicrobial; Activity.

1286. Synthesis and Biological Screening of New 4-Substituted-2-(3,4,5- Trimethoxyphenyl) Quinazolines as Potential Anticancer Agents

Ehab M. Gedawy and Zeinab Mahmoud

Der Pharma Chemica, 7(11): 162-171 (2015)

Cancer is an umbrella term including a diversity of diseases. The need for new anticancer agents is a necessity. On the other hand, quinazolines are biologically interesting scaffold. 4-substituedamino-2-(3,4,5- trimethoxy)quinazolines were synthesized using anthranilamide as a starting material. Thirteen novel 2-(3,4,5- trimethoxyphenyl)quinazolines 4a-d and 5a-h were synthesized. The NCI - USA has chosen seven compounds namely 5a and 5c-h of the new quinazoline derivatives for the 60-cell lines screening. Compound 5c showed null growth percent towards the melanoma MDA-MB-435 cell line. The IC$_{50}$ for 5c was also investigated for both nonsmall cell lung cancer cell line A549 and colon cancer cell line HCT116. The results were 8.57 and 10.10 μM/ml respectively.

Keywords: Anticancer agents; 2-(3,4,5-Trimethoxyphenyl) quinazolines; Synthesis.

1287. Design, Synthesis and Biological Evaluation of New Thieno[2,3-D]Pyrimidines as Anti-Inflammatory Agents

Afaf A. El-Malah and Asmaa E. Kassab

Anti-Inflammatory and Anti-Allergy Agents in Medicinal Chemistry, 14: 204-214 (2015)

Background: Long term use of NSAIDS is mainly accompanied by major health implications such as gastrointestinal erosions, ulcerations and nephrotoxicity. These side effects arise from local irritation by the carboxylic acid moiety, that is common to most of NSAIDs (topical effect), in addition to decreased cytoprotective prostaglandin production. Therefore, in the medicinal chemistry research area, there is an ongoing need for the discovery of new, potent and safer anti-inflammatory lead compounds devoid of the irritant carboxylic acid moiety.

Methods: A series of new 3-substituted-2-thioxo-thieno[2,3-d]pyrimidine derivatives were synthesized through reacting the starting 3-amino-2-thioxo-thieno[2,3-d]pyrimidines with different aromatic aldehydes. The structure of all newly synthesized compounds was confirmed with spectral and elemental analyses. The synthesized thieno[2,3-d]pyrimidines were investigated for in vivo anti-inflammatory activity, using the carrageenan induced paw edema test. The possible antiinflammatory mechanism was also evaluated by determining the concentration of prostaglandin E$_2$ (PGE$_2$) in blood serum using a rat specific PGE$_2$ ELISA kit.

Results: All test compounds could significantly reduce carrageenan induced paw edema comparable to diclofenac sodium as a potent anti-inflammatory drug. Moreover, they could decrease the concentration of PGE$_2$ in blood serum. Interestingly, compound 4c exhibited the most potent in vivo anti-inflammatory activity with protection of 35%, 36% and 42% against carrageenan-induced paw edema after 1h, 2h and 3h, representing 92%, 86% and 88% respectively of diclofenac activity. It also decreased the concentration of PGE$_2$ in blood serum to 19 pg/ mL which is comparable to diclofenac with PGE2 concentration of 12 pg/ mL. Moreover, Compounds 4f, 4a, 4i and 4e exerted significant anti-inflammatory activity after 4h, representing 71%, 69%, 63% and 61% respectively of diclofenac activity. Furthermore, they significantly decreased the concentration of PGE$_2$ in blood serum.

Conclusion: These thienopyrimidines may be used as good candidates for the search of promising, potent and safe antiinflammatory leads for being free from acidic functions.

Keywords: Anti-inflammatory activity; Synthesis; 2-Thioxo-thieno[2,3-D]Pyrimidines; Prostaglandin E2 (PGE$_2$).

Dept. of Pharmaceutical Technology and Industerial Pharmacy

1288. Self-microemulsifying Systems of Finasteride With Enhanced Oral Bioavailability: Multivariate Statistical Evaluation, Characterization, Spray-drying and in Vivo Studies in Human Volunteers

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Nanomedicine, 10: 3373-3389 (2015) IF: 5.413

Aim: To develop Finasteride-loaded self micro-emulsifying drug delivery systems (SMEDDS) for the treatment of hormonal associated problems.

Materials and Methods: Ternary phase diagrams were constructed to obtain self-emulsification regions. Multivariate statistical methods viz. Principal component analysis and agglomerative hierarchy clustering analysis were used to evaluate the microemulsions stability. In vitro redispersibility study was adopted and two formulations were selected for spray-drying. Further investigations were performed (Fourier transform infrared, x-ray diffraction and transmission electron microscopy). Finally, the in vivo performance was tested in human volunteers.

Results: Multivariate statistical methods selected stable SMEDDS. Spray-drying utilizing maltodextrin/leucin carrier system yielded a flowable product. Selected solid SMEDDS scored 129.35% relative bioavailability compared with a commercial tablet.

Conclusion: The developed SMEDDS poses successful platform for glucosteroid analogs oral delivery.

Keywords: Hierarchical clustering; Human volunteers; Microemulsion; Principal component; SMEDDS; Spray-drying.

Medicine Sector

1289. Jejunal Infusion of Levodopa–carbidopa Intestinal Gel Versus Oral Administration of Levodopa–carbidopa Tablets in Japanese Subjects With Advanced Parkinson'S Disease: Pharmacokinetics and Pilot Efficacy and Safety

Ahmed A. Othman, Krai Chatamra, Mohamed Eslam F. Mohamed, Sandeep Dutta, Janet Benesh, Masayoshi Yanagawa and Masahiro Nagai

Background and Objective: Oral levodopa-carbidopa (LC-oral) treatment in advanced Parkinson's disease (PD) is associated with motor complications due to large fluctuations in levodopa plasma concentrations. Levodopa–carbidopa intestinal gel (LCIG) provides individualized continuous levodopa–carbidopa delivery through intrajejunal infusion. This study evaluated the pharmacokinetics, safety, and efficacy of LCIG relative to LC-oral in Japanese subjects with advanced PD.
Methods: Subjects with advanced PD were converted from their anti-PD medications to individually optimized doses of LC-oral (10:1 levodopa:carbidopa ratio) for 28 days (baseline; period 1) followed by switching to intrajejunal infusion of LCIG (4:1 ratio) for 21 days (period 2). Pharmacokinetics, adverse events (AEs), and efficacy were assessed.
Results: Eight patients were enrolled. Six received LCIG and four reported at least one AE [most common: fall (33.3 %), dyskinesia (33.3 %)]; one discontinued due to an AE. The average daily dose was 1230/123 and 1370/342 mg levodopa/carbidopa for LC-oral and LCIG, respectively, at the end of each period. The degree of fluctuation and intra-subject variability of levodopa plasma concentrations were 5.5- and 4-fold lower, respectively, with LCIG than with LC-oral. Levodopa bioavailability was 99 % for LCIG relative to LC-oral. Compared with baseline, LCIG decreased "Off" time (2.68 h, P = 0.002) and increased "On" time without troublesome dyskinesia (2.35 h, P = 0.006) in the PD Diary©. With the small sample size, no statistically significant changes were seen on other efficacy endpoints.
Conclusions: In Japanese subjects with advanced PD, LCIG resulted in an improved pharmacokinetic profile that appeared to be associated with reduced motor complications compared with LC-oral. These results extend previous findings in mainly Caucasian populations.
Keywords: Levodopa; LCIG; Pharmacokinetics; Parkinson's; Japanese.

1290. For mulation of Convenient, Easily Scalable, and Efficient Granisetron HCI Intranasal Droppable Gels

Howida K. Ibrahim, Nevine S. Abd El-Malak and Sally A. Abd El-Halim

Deacetylated gellan gum and two sodium alginate polymer types were used each at three concentrations in the suitable range for their sol-gel transition. The prepared nine droppable gels were evaluated in vitro, ex vivo through sheep nasal mucosa, as well as in vivo in comparison to drug solution given intravenously and orally at the same dose. The prepared formulas gelled instantaneously in simulated nasal fluid and the obtained gels sustained their shear thinning and thixotropic behavior up to 48 h. Polymer type and concentration had significant effects on the apparent viscosities and the in vitro release profile of granisetron from the prepared gels. The drug release data best fitted a modified Higuchi equation with initial burst and followed Fickian diffusion mechanism. A 0.5% gellan-gum-based formula sustained the in vitro drug release up to 3 h and enhanced the drug permeation without need for an enhancer. The histopatholgical study revealed the safety of the tested formula. Intranasal delivery recorded double the drug bioavailabilty in comparison to the oral route. It had an absolute bioavailability of 0.6539 and the maximum plasma drug concentration reached after 1.5 h. The developed formula could be promising for the management of chemotherapy-induced nausea and vomiting regarding its improved bioavailability, patient acceptability, and ease of production
Keywords: Granisetron HCI; Droppable GEL; Intranasal delivery.

1291. Preparation, Optimization, and in Vitro Simulated Inhalation Delivery of Carvedilol Nanoparticles Loaded on A Coarse Carrier Intended for Pulmonary Administration

Aly A Abd El-Bary, Abdulaziz M. Al-mahallawi, Mohamed E. Abd El-Rahim and Ahmed M. A. Ali

Carvedilol (CAR) is a potent antihypertensive drug but has poor oral bioavailability (24%). A nanosuspension suitable for pulmonary delivery to enhance bioavailability and bypass first-pass metabolism of CAR could be advantageous. Accordingly, the aim of this work was to prepare CAR nanosuspensions and to use artificial neural networks associated with genetic algorithm to model and optimize the formulations. The optimized nanosuspension was lyophilized to obtain dry powder suitable for inhalation. However, respirable particles must have a diameter of 1–5 µm in order to deposit in the lungs. Hence, mannitol was used during lyophilization for cryoprotection and to act as a coarse carrier for nanoparticles in order to deliver them into their desired destination. The bottom-up technique was adopted for nanosuspension formulation using Pluronic stabilizers (F127, F68, and P123) combined with sodium deoxycholate at 1:1 weight ratio, at three levels with two drug loads and two aqueous to organic phase volume ratios. The drug crystallinity was studied using differential scanning calorimetry and powder X-ray diffractometry. The in vitro emitted doses of CAR were evaluated using a dry powder inhaler sampling apparatus and the aerodynamic characteristics were evaluated using an Andersen MKII cascade impactor. The artificial neural networks results showed that Pluronic F127 was the optimum stabilizer based on the desired particle size, polydispersity index, and zeta potential. Results of differential scanning calorimetry combined with powder X-ray diffractometry showed that CAR crystallinity was observed in the lyophilized nanosuspension. The aerodynamic characteristics of the optimized lyophilized nanosuspension demonstrated significantly higher percentage of total emitted dose (89.70%) and smaller mass median aerodynamic diameter (2.80 µm) compared with coarse drug powder (73.60% and 4.20 µm, respectively). In summary, the above strategy confirmed the applicability of formulating CAR in the form of nanoparticles loaded on a coarse carrier suitable for inhalation delivery.
Keywords: Aerodynamic diameter; Freeze-drying; Artificial neural networks; Pluronics; Nanosizing; Cascade impactor.

1292. Design and for Mulation of A Topical Hydrogel Integrating Lemongrass-loaded Nanosponges With an Enhanced Antifungal Effect: in Vitro/In Vivo Evaluation

Hibah M. Aldawsari,Shaimaa M. Badr El-Din, Gihan S. Labib and Amal H. El-Kamel

Lemongrass oil (LGO) is a volatile oil extracted from the leaves of Cymbopogon citratus that has become one of the most important natural oils in the pharmaceutical industry because of its diverse pharmacologic and clinical effects. However, LGO suffers from low aqueous solubility, which could lead to a reduced effect. Moreover, the instability of its major active constituent, citral, could lead to volatilization, reaction with other formulation ingredients, and consequently, skin irritation. To surmount these problems, this research aims to formulate lemongrass-loaded ethyl cellulose nanosponges with a topical hydrogel with an enhanced antifungal effect and decreased irritation. The minimal inhibitory concentration and minimal fungicidal concentration of LGO against Candida albicans strain ATC 100231, determined using the broth macrodilution method, were found to be 2 and 8 μL/mL, respectively. The emulsion solvent evaporation technique was used for the preparation of the nanosponges. The nanosponge dispersions were then integrated into carbopol hydrogels (0.4%). Nine formulations were prepared based on a 32 full factorial design employing the ethyl cellulose:polyvinyl alcohol ratio and stirring rate as independent variables. The prepared formulations were evaluated for particle size, citral content, and in vitro release. Results revealed that all the nanosponge dispersions were nanosized, with satisfactory citral content and sustained release profiles. Statistical analysis revealed that both ethyl cellulose:polyvinyl alcohol ratio and stirring rate have significant effects on particle size and percentage released after 6 hours; however, the effect of the stirring rate was more prominent on both responses. The selected hydrogel formulation, F9, was subjected to surface morphological investigations, using scanning and transmission electron microscopy, where results showed that the nanosponges possess a spherical uniform shape with a spongy structure, the integrity of which was not affected by integration into the hydrogel. Furthermore, the selected formulation, F9, was tested for skin irritation and antifungal activity against C. albicans, where results confirmed the nonirritancy and the effective antifungal activity of the prepared hydrogel.

Keywords: Cymbopogon citrates; Citral; Volatile oil; Factorial design; Ethyl cellulose; Candida albicans; GEL.

1293. Bioenhanced Sublingual Tablet of Drug With Limited Permeability Using Novel Surfactant Binder and Microencapsulated Polysorbate: in Vitro/In Vivo Evaluation

Doaa Ahmed El-Setouhy, Emad B. Basalious and Nevine Shawky Abd El-Malak

Formulation of sublingual tablets of drugs with limited permeability poses a great challenge due to their poor absorption.

In this study, bioenhanced sublingual tablets (BESTs) of zolmitriptan were prepared using novel surfactant binder (Pluronicp123/Syloidmixture) to enhance tablet disintegration and dissolution. Microencapsulated polysorbate 80 (Sepitrap™ 80) were included in the composition of BESTs to enhance the drug transport through the sublingual mucosa. Tablets were evaluated for in vitro/in vivo disintegration, in vitro dissolution and ex vivo permeation. Solubility studies confirmed that phosphate buffer; pH 6.8 could be used as dissolution medium for sublingual tablets of zolmitriptan. BEST-5 containing Pluronicp123/Syloidmixture and Sepitrap™ 80 exhibited the shortest in vitro/in vivo disintegration times (<30 s), the highest dissolution at early time dissolution points and the highest enhancement of drug transport through mucosal membrane. The in vivo pharmacokinetic study using human volunteers showed a significant increase in the rate and extent of sublingual absorption with less variations of Tmax after sublingual administration of both BEST-5 and Zomig-ZMT ODT. Our results proposed that Pluronicp123/Syloidmixture and Sepitrap™ 80 could be promising for the development of sublingual tablets for rapid onset of action of drugs with limited permeability.

Keywords: Limited permeability bioenhancer sublingua; L microencapsulated solubilizer; Surfactant binder; PluronicP123/syloidMixture.

1294. Floating Lipid Beads for the Improvement of Bioavailability of Poorly Soluble Basic Drugs: In-Vitro Optimization and In-Vivo Performance in Humans

Samar M. Abouelatta, Ahmed A. Aboelwafa, Rawia M. Khalil and Omaima N. El-Gazayerly

The challenge in developing oral drug delivery systems of poorly soluble basic drugs is primarily due to their pH dependent solubility. Cinnarizine (CNZ), a model for a poorly soluble basic drug, has pH dependent solubility; where it dissolves readily at low pH in the stomach and exhibits a very low solubility at pH values greater than 4. It is also characterized by a short half life of 3–6 h, which requires frequent daily administration resulting in poor patient compliance. In an attempt to solve these problems, extended release floating lipid beads were formulated. A 2^4 full factorial design was utilized for optimization of the effects of various independent variables; lipid:drug ratio, % Pluronic F-127, % Sterotex, and Gelucire 43/01:Gelucire 50/13 ratio, on the loading efficiency and release of CNZ from the lipid beads. In-vivo pharmacokinetic study of the optimized CNZ-lipid beads compared to Stugeron® (reference standard) was performed in healthy human volunteers. A promising approach for enhancing the bioavailability of the poorly soluble basic drug, CNZ, utilizing novel and simple floating lipid beads was successfully developed. Zero order release profile of CNZ was achieved for 12 h. Mean $AUC_{0–24}$ and $AUC_{0–\infty}$ of the optimized CNZ-loaded lipid beads were 4.23 and 6.04 times that of Stugerontablets respectively.

Keywords: Cinnarizine gelucire sterotex factorial design pluronic F-127 pharmacokinetics.

1295. Design and Optimization of Topical Methotrexate Loaded Niosomes for Enhanced Management of Psoriasis: Application of Box-Behnken Design, In-Vitro Evaluation and In-Vivo Skin Deposition Study

Aly A. Abd El-Bary and Mohamed H. H. Abou Ghaly

Psoriasis, a skin disorder characterized by impaired epidermal differentiation, is regularly treated by systemic methotrexate (MTX), an effective cytotoxic drug but with numerous side effects. The aim of this work was to design topical MTX loaded niosomes for management of psoriasis to avoid systemic toxicity. To achieve this goal, MTX niosomes were prepared by thin film hydration technique. A Box-Behnken (BB) design, using Design-Expert(®) software, was employed to statistically optimize formulation variables. Three independent variables were evaluated: MTX concentration in hydration medium (X1), total weight of niosomal components (X2) and surfactant: cholesterol ratio (X3). The encapsulation efficiency percent (Y1: EE%) and particle size (Y2: PS) were selected as dependent variables. The optimal formulation (F12) displayed spherical morphology under transmission electron microscopy (TEM), optimum particle size of 1375.00 nm and high EE% of 78.66%. In-vivo skin deposition study showed that the highest value of percentage drug deposited (22.45%) and AUC0-10 (1.15 mg.h/cm(2)) of MTX from niosomes were significantly greater than that of drug solution (13.87% and 0.49 mg.h/cm(2), respectively). Moreover, in-vivo histopathological studies confirmed safety of topically applied niosomes. Concisely, the results showed that targeted MTX delivery might be achieved using topically applied niosomes for enhanced treatment of psoriasis.
Keywords: Box-behnken; In-vivo histopathological study; In-vivo skin deposition; Methotrexate; Niosomes.

1296. Long-circulating Lipoprotein-Mimic Nanoparticles for Smart Intravenous Delivery of A Practically-insoluble Antineoplastic Drug: Development, Preliminary Safety Evaluations and Preclinical Pharmacokinetic Studies

Mina Ibrahim Tadros and Abdulaziz Mohsen Al-Mahallawi

Chlorambucil (CHL) is a water-insoluble antineoplastic drug having a short elimination half-life. It suffers from remarkable differences in pharmacokinetics following oral administration. The current work aimed to assess safety and pharmacokinetics of CHL-loaded, lipoprotein-mimic, nanoparticles (NPs) following intravenous administration. The design of NPs was based on complexation between egg yolk lecithin (EYL) and bovine serum albumin (BSA). The NPs were preliminary evaluated via FT-IR, DSC and P-XRD. The NPs were characterized for particle size, zeta potential, morphology and drug entrapment efficiency (EE%). The best achieved NP dispersion (LP6) and CHL solution were challenged for in vitro hemolytic potential, in vivo vascular irritation studies in rabbits and in vivo pharmacokinetics following intravenous administration in rats. The results confirmed that NPs were stabilized by hydrophobic-attractions

and hydrogen-bondings between CHL, BSA and EYL. The amorphous dispersion of CHL within NPs was revealed. LP6 dispersion displayed monodispersed nano-spherical particles (144.33 ± 2.17 nm). It possessed the highest negative zeta potential (-30.55 ± 0.24 mV) and the largest EE% (86.35 ± 2.33%). The significantly (P < 0.05) prolonged MRT(0-8), longer elimination t50% and reduced plasma clearance highlighted the long-circulating characteristics of LP6. The preliminary safety evaluations and the seven-fold increase in bioavailability elucidated potentiality for smart intravenous delivery of CHL.
Keywords: Bovine serum albumin; Chlorambucil; Egg yolk Lecithin; Intravenous delivery; Lipoprotein-mimic nanoparticles.

1297. Duodenum-Triggered Delivery of Pravastatin Sodium Via Enteric Surface-coated Nanovesicular Spanlastic Dispersions: Development, Characterization and Pharmacokinetic Assessments

Saadia Ahmed Tayel, Mohamed Ahmed El-Nabarawi, Mina Ibrahim Tadros and Wessam Hamdy Abd-Elsalam

Pravastatin sodium (PVS) is a hydrophilic HMG-CoA reductase inhibitor that is mainly absorbed from duodenum. PVS has a short elimination half-life (1-3 h), suffers from instability at gastric pH, extensive hepatic first-pass metabolism and low absolute bioavailability (18%). The current work aimed to develop enteric surface-coated spanlastic dispersions as controlled-release duodenum-triggered systems able to surmount PVS drawbacks. PVS-loaded spanlastic dispersions were prepared by ethanol-injection method using span(®) 60. Tween(®) 60 and Tween(®) 80 were explored as edge activators. As a novel approach, the fine spanlastic dispersions were surface-coated with an enteric-polymer (Eudragit(®) L100-55) via freeze-drying. The systems were evaluated, before and after enteric-coating, for particle size, zeta potential, PVS entrapment efficiency (EE%), morphology and PVS release studies. PVS pharmacokinetics from the best achieved system and an aqueous solution were estimated in rats by UPLC-MS/MS. The best achieved enteric surface-coated spanlastic dispersion (E-S6) displayed spherical nanosized vesicles (647.60 nm) possessing negative zeta potential (-6.93 mV), promising EE% (63.22%) and a biphasic drug-release pattern characterized by a retarded-release phase (0.1 N HCl, 2 h) and a controlled-release phase (pH 6.8, 10 h). The higher Cmax, delayed Tmax, prolonged MRT(0-8), longer elimination t50% and enhanced oral bioavailability unravel E-S6 potential for oral PVS delivery.
Keywords: Duodenum-triggering; Enteric surface-coating; Ethanol injection method; Pravastatin sodium; Spanlastic dispersions; UPLC–MS/MS.

1298. Novel Self-Nanoemulsifying Self-Nanosuspension (SNESNS) for Enhancing Oral Bioavailability of Diacerein: Simultaneous Portal Blood Absorption and Lymphatic Delivery

Hanan M. El-Laithy, Emad B. Basalious, Boushra M. El-Hoseiny and Maha M. Adel

The application of self-nanoemulsified drug delivery system (SNEDDS) to improve bioavailability of diacerein (D) has been hampered by its large dose and limited solubility. This work aimed to prepare diacerein loaded self nanoemulsifying self nanosuspension (D-SNESNS) containing high drug load. DSNESNS was prepared by homogenizing D into MaisineTM-based SNEDDS that gave the highest drug solubility. D-SNESNS was evaluated for particle size, zeta potential and in vitro dissolution. Significant increase of D solubility was observed from D-SNESNS (309 mg/mL) than traditional SNEDDS (162 mg/mL) due to the spontaneous simultaneous formation of nanoemulsion and nanosuspension (top–down approach). When exposed to water with mild agitation, the drug microparticles in D-SNESNS are temporarily surrounded by unsaturated aqueous layer (containing optimum concentrations of surfactant and co-solvent) that facilitates the erosion of the suspended drug particles into nanosized ones. Nanoemulsion-based nanosuspension (NENS) was confirmed using transmission electron microscopy and particle size analysis. D-SNESNS equivalent to 50 mg D exhibited complete and very rapid dissolution after 15 min in phosphate buffer pH 6.8 due to the existence of D as solubilized molecules inside nanoemulsion globules and nanosized suspended drug particles forming D-NENS. The relative bioavailabilities of rhein from D-SNESNS in rats with normal and blocked chylomicron flow were about 210% and 164%, respectively in comparison to aqueous D suspension. The significant increase in the dissolution, portal absorption and lymphatic delivery of D propose that SNESNS could be promising to improve oral bioavailability of poorly water soluble drugs that have limited drug load in SNEDDS.
Keywords: Diacerein; Self-nanoemulsifying self-nanosuspension; SNESNS; Portal absorption; Lymphatic delivery; Blocked chylomicron flow.

1299. Novel Self-assembled Nano-tubular Mixed Micelles of Pluronics P123, Pluronic F127 and Phosphatidylcholine for Oral Delivery of Nimodipine: in Vitro Characterization, Ex Vivo Transport and in Vivo Pharmacokinetic Studies

Emad B. Basalious and Rehab N. Shamma

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Subarachnoid hemorrhage (SAH) is a major cause of death in patients suffering from stroke. Nimodipine (NM) is the only FDA-approved drug for treating SAH-induced vasospasm. However, NM suffers from poor oral bioavailability (5–13%) due to its low aqueous solubility, extensive first pass metabolism and short elimination half-life (1–2 h). The objective of this study was to develop NM-loaded Pluronic/ phosphatidylcholine/polysorbate 80 mixed micelles (PPPMM) that can solubilize NM in aqueous media even after dilution, prolong its circulation time, improve its bioavailability and eventually help in targeting it to the brain tissue. PPPMM formulations were prepared using the thin film hydration technique, and evaluated for drug payload, solubilization efficiency (SE), micellar size, zeta potential, transmission electron microscopy (TEM) and ex vivo transport through rat intestine. The selected NMloaded PPPMM, containing PC to Pluronics1molar ratio of 75:25, showed a drug payload, SE, micellar size and zeta potential of 1.06 0.03 mg/mL, 99.2 2.01%, 571.5 11.87 nm and 31.2 0.06 mv, respectively. The selected

formulation had a much larger hydrophobic core volume for solubilization of NM and exhibited the highest NM transport. TEM micrographs illustrated the formation of highly flexible nanotubular mixed micelles (NTMM). The in vivo pharmacokinetic study showed greater bioavailability of NM in plasma (232%) and brain (208%) of rats from NM-loaded PPPMM compared to that of the drug solution due to the efficiency of flexible NTMM to enhance absorption of NM from the intestinal mucosa. The significant increase in drug solubility, enhanced drug absorption and the long circulation time of the NTMM could be promising to improve oral and parenteral delivery of NM
Keywords: Nimodipine; Nano-tubular Mixed micelles; Pluronics; Phosphatidylcholine; Thermodynamic stability of micelles; Subarachnoid hemorrhage.

1300. Investigating the Cubosomal Ability for Transnasal Brain Targeting: in Vitro Optimization, Ex Vivo Permeation and in Vivo Biodistribution

Fatma Elzahraa Abd El-Rahman, Ibrahim Elsayed, Mary Kamal Gad, Ahmed Badr and Magdi Ibrahim Mohamed

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The aim of this study was to enhance the risperidone delivery to the brain through the transnasal route via optimization of cubosomal gel. Cubosomes were prepared using glycerol mono-oleate (GMO), Pluronic F127 (PF127) and Tween 80 (T80). The prepared formulae were characterized by testing their particle size, polydispersity index, zeta potential, entrapment efficiency, in vitro drug release and transmission electron microscopy. Central composite design was planned for the formulae optimization and the selected formula (containing PF127 with concentration 15 mg/g GMO and T80 with concentration of 20 mg/L) was re-prepared in presence of gelling polymer (gellan gum or polyox). The optimal cubosomal gel (containing 0.4% w/v polyox) had been subjected to ex-vivo permeation, histopathological evaluation and in vivo biodistribution studies. It showed significantly higher transnasal permeation and better distribution to the brain, when compared to the used control (drug solution and/or suspension). Finally, the cubosomal gel could be considered as a promising carrier for brain targeting of CNS acting drugs through the transnasal route.
Keywords: Biodistribution; Cubosomes; Gel; Glyceryl mono-oleate; Permeation; Pluronic; Risperidone; Risperidone; Tween.

1301. Leflunomide Biodegradable Microspheres Intended for Intra-articular Administration: Development, Anti -inflammatory Activity and Histopathological Studies

Doaa Ahmed El-Setouhy, Nevine Shawky Abd El-Malak, Shady E. Anis and Dina Louis

International Journal of Pharmaceutics, 495: 664-670 (2015) IF: 3.65

Leflunomide, the disease-modifying anti-rheumatic drug was formulated as microspheres for prolonged drug release in the form of intraarticular injection. Eight formulations were developed using three biodegradable PDLG polymers

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(lactide/glycolide copolymer) and polycaprolactone (PLC) at two drug:polymer ratios (1:2 and 1:4).

Solvent evaporation method was employed using polyvinyl alcohol or hydropxypropyl methylcellulose as stabilizers. Formulations were assessed for encapsulation efficiency, yield, particle size, release pattern and SEM. F6 (PDLG 5010), with appropriate particle size and prolonged drug release, was chosen for in-vivo studies using arthritis induced rats, which were intrarticularly injected with F6 or took oral Avara®.

Nuclear factor-kappa B measurements and histopathologic studies were conducted. There was significant reduction of inflammation caused by both F6 and oral Avara®.

Histopathologic studies showed minimal infiltration by chronic inflammatory cells and no angiogenesis in F6 compared to Avara®.

Results also revealed biocompatibility of the polymer used.

Keywords: Leflunomide; Microspheres; Polycaprolactone; Nuclear kappa factor; Intraarticular injection; Histopathology.

1302. Investigating the Potential of Employing Bilosomes as A Novel Vesicular Carrier for Transdermal Delivery of Tenoxicam

Abdulaziz M. Al-mahallawi, Aly A. Abd El-Bary and Mona H. Aburahma

Bilosomes represent an evolving vesicular carrier that have been explored for oral vaccines delivery based on its ability to resist enzymes and bile salts in the gastrointestinal tract (GIT). Bilosomes vesicles are formed of bilayer membrane of non-ionic surfactant molecules encompassing bile salts. Although, bilosomes have not been proposed for transdermal drug delivery, this carrier seems to have promising potential in this regard. Accordingly, the aim of this investigation was to assess the capability and safety of utilizing bilosomes for transdermal delivery of tenoxicam (TX) as a model drug. A $3^1 2^2$ full factorial design was adopted to study the effects of different formulation parameters on bilosomes properties and select the optimal formulation using Design-Expert1 software. The selected formulation displayed nano-sized spherical vesicles (242.5 ± 6.43 nm) with reasonable entrapment efficiency percent ($68.33 \pm 2.33\%$). Confocal laser scanning microscopy confirmed the capability of the flourolabeled bilosomes to penetrate deep within the skin. Both, ex vivo permeation and in vivo skin deposition studies confirmed the superiority of bilosomes over drug solution in delivering TX transdermally. In addition, in vivo histopathological study proved the safety of topically applied bilosomes. In summary, the highlighted results confirmed that bilosomes can be further adopted for delivering drugs transdermally.

Keywords: Bilosomes; Bile salts; Histopathology; Ex vivo permeation; In vivo skin deposition; Confocal laser scanning microscopy.

1303. Preclinical Evaluation of Dual Action Intranasal for Mulation Intended for Postoperative/cancer Associated Therapies

Doaa Ahmed El-Setouhy, Sami Ahmed, Alia Abd El-Latif Badawi, Mohamed Ahmed El-Nabarawi and Nada Sallam

Granisetron hydrochloride is a potent antiemetic yet experiencing first pass metabolism. Ketorolac tromethamine is a potent analgesic NSAID that is known to cause gastrointestinal complications. The purpose of this study is to prepare combined in situ nasal copolymer thermal gel combining both drugs for the management of postoperative and cancer associated nausea, vomiting and pain while avoiding the problems associated with their therapy. In situ gelling nasal formulations with/without different mucoadhesive polymers were prepared and evaluated. Viscosity of different formulations was measured and correlated to in-vitro drug release. Selected formulae were evaluated for in-vivo mucociliary transit time. Based on in-vitro release pattern and mucociliary transit time, the selected formula F4 was evaluated for chemical and thermal anti-nociception activity in rats following intranasal or intraperitoneal administration. Only the intra-nasal administration of the selected formulation F4 showed significant analgesia against chemical nociception during both the early and late phases. Also, intranasal administration of the selected formulation F4 showed significant analgesia against thermal nociception. F4 intranasal formulation may offer higher therapeutic value than oral administration as it may not only avoid granisetron first pass metabolism but may also minimize ketorolac gastrointestinal adverse effects as well.

Keywords: Granisetron; ketorolac; Nasal drug delivery; Mucosal drug delivery; Thermal gels.

1304. The Role of P-Glycoprotein in Drug Resistance in Multiple Myeloma

Joseph Abraham, Noha N. Salama and Abd El-Kareem Azab

Multiple myeloma (MM) is a malignant neoplastic cancer of the plasma cells that involves the bone marrow. The majority of patients with MM initially respond to chemotherapy, but they eventually become resistant to later drug therapy. One of the reasons for drug resistance in patients with MM is efflux transporters. P-glycoprotein (P-gp) is the most studied of the multidrug resistance proteins, and is up-regulated in response to many chemotherapeutic drugs. This up-regulation of P-gp causes a decrease in the intracellular accumulation of these drugs, limiting their therapeutic efficacy. In this review, we focus on the role of P-gp in drugs used for patients with MM. P-gp has been found to be an important factor with regard to drug resistance in many of the drug classes used in the treatment of MM (proteasome inhibitors, anthracyclines, alkylating agents and immunomodulators are examples). Thus, our further understanding of its mechanism and inhibitory effects will help us decrease drug resistance in patients with MM.

Keywords: Drug resistance; Chemotherapeutic approaches; Myeloma.

1305. Bumadizone Calcium Dihydrate Microspheres Compressed Tablets for Colon Targeting: for mulation, Optimization and in Vivo Evaluation in Rabbits

Samia A. Nour, Nevine Shawky Abd El-Malak and Marianne J. Naguib

The objective of this study was the development of a colon-targeted microspheres which were compressed into tablets containing the non-steroidal anti-inflammatory bumadizone calcium dihydrate. A 3^2 full factorial design was adopted for the evaluation of the prepared microspheres. The effect of two independent variables namely polymer type (Eudragit RS100, ethyl cellulose and cellulose acetate butyrate), and drug: polymer ratio (1:1, 9:1 and 18:1) was studied on the entrapment efficiency and in vitro drug release for 12 h. Colon targeting aims to minimize the release of the drug off target area (pH 1.2 and 6.8) and to maximize the release of the drug in target area (pH 7.4). Candidate formulae were compressed into core tablets and colon targeting was achieved using the enzyme-dependent polymer (pectin) as coat in three different concentrations 50, 75 and 90%. Candidate formula F15 (microspheres prepared using BDZ:CAB in a ratio of 18:1 and compressed into tablets using 50% pectin and 50% Avicel in the coat) was able to adequately modulate drug release avoiding drug release in the gastric ambient, and reaching the colonic targeting where 99.7% release was achieved within 12 h following zero-order model. In vivo studies showed that F15 achieved significant decrease in myeloperoxidase activity and inflammation with delayed T_{max} (4 h) and lower C_{max} (2700 ng/ml) when compared to marketed product

Keywords: Bumadizone calcium; Colon targeting; Histopathology; Microspheres compressed into tablets; Myeloperoxidase activity; Pharmacokinetic parameters.

1306. For Mulation of Tretinoin-loaded Topical Proniosomes for Treatment of Acne: in-Vitro Characterization, Skin Irritation Test and Comparative Clinical Study

Salwa Abd El-Rahman, Nevine Shawky Abd El-Malak, Alia Badawi, Tahany El-Bayoumy, Nermeen Sabry and Amany El-Ramly

Tretinoin (TRT) is a widely used retinoid for the topical treatment of acne, photo-aged skin, psoriasis and skin cancer which makes it a good candidate for topical formulation. Yet side effects, like redness, swelling, peeling, blistering and, erythema, in addition to its high lipophilicity make this challenging. Therefore, the aim of this study was the development of TRT-loaded proniosomes to improve the drug efficacy and to increase user acceptability and compliance by reducing its side effects. Nine formulae were prepared according to 3^2 factorial design and were evaluated for their morphology, vesicle size, entrapment efficiency (EE %), and% of drug released after 5 h. Hydrogel of the candidate formula, N8G (proniosomes prepared with 0.025% TRT, and Span60: cholesterol molar ratio of 3:1 and incorporated in 1% carbopol gel) was developed and evaluated for skin irritation test and clinical study in acne patients compared to marketed product. Candidate formula showed higher efficacy and very low irritation potential when compared to marketed product in human volunteers.

Keywords: Acne patients; Clinical study; Proniosomes; Skin irritation; Tretinoin.

1307. Niosomal Encapsulation of Ethambutol Hydrochloride for Increasing its Efficacy and Safety.

Mohammed Shafik El-Ridy, Soad Aly Yehia, Mahfouz Abd El-Megeid Kassem, Dina Mahmoud Mostafa, Essam Amin Nasr and Marwa Hasanin Asfour

Context: Tuberculosis (TB) is a worldwide health concern. In 2011, about 8.7 million new cases developed TB and 1.4 million people died from it. OBJECTIVE: Enhancement of ethambutol hydrochloride activity and safety in treatment of TB through niosomal encapsulation.

Materials and Methods: Niosomes were prepared by the thin-film hydration method. They were characterized, investigated for in vitro release, lung disposition and in vivo biological evaluation.

Results: Entrapment efficiency of ethambutol hydrochloride ranged from 12.20% to 25.81%. Zeta potential values inferred stability of neutral and negatively charged formulations. In vitro release was biphasic. Lung targeting was increased by niosomal encapsulation. Biological evaluation revealed superiority of niosomal ethambutol hydrochloride over the free drug. DISCUSSION: Neutral and negatively charged niosomal vesicles are dispersed homogenously unlike positively charged vesicles. Niosomal encapsulation results in controlled drug release. Niosomal formulations targeted more drugs to mice lungs for a prolonged period of time resulting in: decreased root-specific lung weight, bacterial counts in lung homogenates and optimizing pathological effect on guinea pigs lungs, livers and spleens. **Conclusion**: Encapsulation of ethambutol hydrochloride in niosomal formulations for the treatment of TB provides higher efficacy and safety compared with the free drug.

Keywords: Biological evaluation; Characterization; Intracellular targeting; Nano-drug Delivery; Tuberculosis.

1308. In Vitro and in Vivo Evaluation of Indomethacin Nanoemulsion as A Transdermal Delivery System

Eman S. El-Leithy, Howida Kamal Ibrahim and Rania M. Sorour

Nanoemulsions were investigated as transdermal delivery systems for indomethacin. Six formulae were prepared using Triacetin, capryol 90 and labrafil as oils; Tween 80 and pluronic F127 as surfactants and transcutol and propylene glycol as co-surfactants. The continuous phase was that one with the larger volume fraction regardless of the hydrophile-lipophile balance of the surfactant/co-surfactant mixture. Surfactant type had significant effects on particle size and rheological properties of the nanoemulsions. Pluronic-based formulae recorded the lowest particle sizes and the highest viscosities. The prepared nanoemulsions increased drug solubility up to 610-fold compared with water. Refractive index measurements proved the compatibility between indomethacin and the used nanoemulsion

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components. Indomethacin was almost completely ionized at the pH values of the prepared nanoemulsions, suggesting drug absorption via the hydrophilic pathway of the skin upon topical application. Nanoemulsions controlled indomethacin release through semipermeable membrane and enhanced its permeation through excised newly born albino rat skin. The formulae were stable for six months at ambient conditions. Transdermal single application of selected formulae resulted in effective plasma levels up to 32 h in rats. Nanoemulsions were significantly superior to other investigated transdermal approaches at solubilizing indomethacin and achieving higher plasma levels.

Keywords: Indomethacin; Nanoemulsion; Permeation; Pharmacokinetics; Phase behavior; Solubilization; Thermodynamic stability; Transdermal.

1309. Design and Development of Novel Lipid Based Gastroretentive Delivery System: Response Surface Analysis, in-Vivo Imaging and Pharmacokinetic Study

Aly Ahmed Abd El-Bary, Ibrahim Elsayed and Ahmed Hassen Elshafeey

Drug Delivery, 22: 37-49 (2015) IF: 2.558

Famotidine HCl has low bioavailability (40-45%) due to its narrow absorption window and low solubility in intestinal pH. Lipids were utilized in the formulation of novel gastroretentive dosage forms to increase the availability of famotidine HCl at its absorption site.

Novel non-swellable gastroretentive lipid disks (D) and swellable compression coated tablets with a lipid core (T) were prepared. Formulae were characterized by friability testing, in-vitro buoyancy, in-vitro drug release and scanning electron microscopy (SEM).

Factorial designs of $2^2 \times 3^1$ and 3^2 were planned for the optimization of disks and tablets, respectively, using Design-Expert® software. X-ray imaging was used for the in-vivo visualization of the selected formula in human gastrointestinal tract (GIT). Moreover, a bioavailability study was performed in healthy human volunteers using the optimized disk formula (D10).

Results: showed that formulae D10 (containing stearyl alcohol and polyethylene glycol in a ratio of 9:1 w/w) and T7 (containing polyethylene oxide only) had highest desirability values (0.684 and 0.842, respectively). Lipids achieved instantaneous floating and sustained the release of famotidine HCl over a prolonged period of time with significant bioavailability enhancement.

Keywords: Factorial design; Gastroretentive; In-vivo imaging; Lipid disks; Pharmacokinetic.

1310. Real Time Stability and Viability Prediction of the Anticancer BCG After Lyophilization

Dalia Mohamed, Ibrahim Elsayed, Aly Fahmy Mohamed and Soad Ali Yehia

Drug Development and Industrial Pharmacy, 41: 1769-1776 (2015) IF: 2.101

To test if trehalose could be a better cryoprotectant for BCG than the usually used lactose and predict viability of BCG during shelf-life, BCG was suspended into three stabilizer systems containing 15% w/v trehalose, trehalose–gelatin mixture (in ratio, 30:1 w/w) or lactose.

Each formula was lyophilized and several quality parameters were tested before and after lyophilization including sterility, safety, viability, morphology and moisture content. Samples of lyophilized formulae were tested for their reconstitution time and others were charged to stability chambers at 5°C for the performance of real time study. Shelf-life of each formula was estimated and correlation between moisture content and loss in viability was established at each time interval of the real time stability study. Sterility, safety and morphology were retained after lyophilization. Just after lyophilization, minute diminish in viability was observed in the presence of each stabilizer (0.02–0.05%).

There was no significant difference in reconstitution time of the three lyophilized formulae. Lactose BCG had the highest shelf-life among the used cryoprotectants during the real time stability studies. Also, moisture content was highly correlated to viability with correlation coefficient ranged between 0.97 and 0.99 and so, the former could be used for prediction of viability throughout the vaccine shelf-life.

Keywords: BCG; Lyophilization; Moisture content; Prediction; Trehalose.

1311. Oro-dental Mucoadhesive Proniosomal Gel for Mulation Loaded With Lornoxicam for Management of Dental Pain

Ghada Ahmed Abd El-Bary and Mona Hassan Aburahma

Journal of Liposome Research, 25: 107-121 (2015) IF: 1.822

Oro-dental diseases are generally associated with pain that is controlled using oral tablets containing NSAIDs. Lornoxicam, a relatively new NSAID, is effective in relieving pain accompanying different oro-dental problems. The aim of the current research is to prepare oro-dental analgesic and anti-inflammatory gel using provesicular approach to deliver lornoxicam directly to the site of action in the oral cavity. Local administration of lornoxicam is expected to be superior to systemic delivery in pain relieving and poses less GIT adverse effects. Different surfactants were utilized to prepare the proniosomal gels that rapidly transform into nano-sized niosomes after hydration with the oral saliva. The effect of the surfactant structure on vesicles size distribution and entrapment efficiency percentage (EE%) was investigated. The proniosomal formulations were incorporated into carbopol hydrogels that were characterized regarding rheological and mucoadhesion properties. Moreover, ex-vivo mucosal membrane permeation studies were conducted for selected proniosomal gels to quantify the permeation parameters and assess the amount of drug deposited within the oral mucosa. Results revealed that mucoadhesive proniosomes formulation prepared using Span 60 was optimal as it was nano-sized and also showed the highest EE%. The transmucosal flux of lornoxicam, from these proniosomal formulations, across the oral mucosa was significantly higher (p<0.05) than lornoxicam containing carbopol gel and the percent drug diffused increased more than twofolds. The results collectively suggest that the mucoadhesive proniosomal gels can be assertively considered as a promising carrier for transmucosal delivery of lornoxicam into the oral cavity.

Keywords: Lornoxicam; Niosomes; Oro-dental Gel; Proniosomes; Skin permeation; Surfactants structure.

1312. Lyophilized Sustained Release Mucoadhesive Chitosan Sponges for Buccal Buspirone Hydrochloride Delivery: For mulation and in Vitro Evaluation

Mohamed A. A. Kassem, Aliaa N. El-Meshad and Ahmed R. Fares

This work aims to prepare sustained release buccal mucoadhesive lyophilized chitosan sponges of buspirone hydrochloride (BH) to improve its systemic bioavailability. Chitosan sponges were prepared using simple casting/freeze-drying technique according to 32 factorial design where chitosan grade was set at three levels (low, medium, and high molecular weight), and concentration of chitosan solution at three levels (0.5, 1, and 2%). Mucoadhesion force, ex vivo mucoadhesion time, percent BH released after 8 h (Q8h), and time for release of 50% BH (T50%) were chosen as dependent variables. Additional BH cup and core buccal chitosan sponge were prepared to achieve uni-directional BH release toward the buccal mucosa. Sponges were evaluated in terms of drug content, surface pH, scanning electron microscopy, swelling index, mucoadhesion strength, ex vivo mucoadhesion time, and in vitro drug release. Cup and core sponge (HCH 0.5E) were able to adhere to the buccal mucosa for 8 h. It showed Q8h of 68.89% and exhibited a uni-directional drug release profile following Higuchi diffusion model.
Keywords: Buspirone HCL; Casting/freeze-drying technique; Chitosan cup and core sponge; Mucoadhesive buccal sponges.

1313. Gastroretentive Ranitidine Hydrochloride Tablets With Combined Floating and Bioadhesive Properties: Factorial Design Analysis, in Vitro Evaluation and in Vivo Abdominal X-Ray Imaging

Hana N. Abduljabbar, Shaimaa M. Badr El-Din and Hibah M. Aldawsari

Ranitidine HCl is an H_2-antagonist that suffers from low oral bioavailability of 50%. The site-specific absorption from the upper part of the small intestine and the colonic metabolism of the drug could partially contribute to its reduced bioavailability. To surmount these drawbacks, this work aimed at the formulation of Ranitidine HCl gastroretentive floating-biaodhesive tablets. A 3^2 factorial design was applied to assess the effects of matrix former (HPMC K100M): drug ratio, and the release retardant (Carbopol 971) amount on the characteristics of the tablets prepared using direct compression technique. The prepared tablets were thoroughly evaluated for physical properties, floating, swelling, bioadhesive and in vitro release behaviors. Statistical analysis of the results revealed significant effects for both formulation variables on the swelling index, maximum detachment force and cumulative percent drug released after 6 hours. In addition, the matrix- former: drug ratio showed a statistically significant effect on the floating lag time. Kinetic analysis of the release data indicated Higuchi diffusion kinetics and anomalous transport mechanism for all formulations. Scanning electron micrographs of the selected tablet formulation; F8, revealed intact surface without any perforations or channels in the dry state, while polymer expansion (relaxation) with some perforated areas were observed on the surface of the tablets after 12 hours dissolution in 0.1 N HCl. Furthermore, in vivo abdominal x-ray imaging showed good floating behavior of the selected formulation; F8, for up to 6 hours with appropriate bioadhesive property. In conclusion, the selected ranitidine HCl floating-bioadhesive tablets could be regarded as a promising gastroretentive drug delivery system that could deliver the drug at a controlled rate.
Keywords: Abdominal x-ray imaging; Bioadhesion force; Carbopol 971; Factorial design; Floating lag time; HPMC K100m; In vitro release; Sodium bicarbonate; Swelling index.

1314. Enhanced Permeation Parameters of Optimized Nanostructured Simvastatin Transdermal Films: Ex Vivo and in Vivo Evaluation

Khalid M. El-Say, Tarek A. Ahmed, Shaimaa M. Badr El-Din, Usama Fahmy, Hibah Aldawsari and Osama A. A. Ahmed

Objective: Detailed optimization process was carried out to enhance permeation parameters, and hence bioavailability, of simvastatin (SMV) transdermal films.
Methods: SMV solubility was investigated in various oils, surfactants and co-surfactants/co-solvents. Mixtures of the selected components were prepared to identify zone of nanoemulsion formation that was utilized in Extreme Vertices mixture design to develop SMV self-nanoemulsifying drug delivery systems (SNEDDS) with minimum globule size. Optimized SMV-SNEDDS were included in the preparation of transdermal films. A fractional factorial design was implemented to evaluate effects of the factors on the amount of SMV permeated. The optimized film was investigated for ex vivo skin permeation and in vivo pharmacokinetic parameters.
Results: The optimum SNEDDS formula was 0.09, 0.8 and 0.11 for Sefsol 218, tween 80 and PEG 200, respectively. Fractional factorial design depicted the optimized SMV transdermal film with 2% HPMC and 2% DMSO as permeation enhancer that showed 1.82-fold improvements in skin flux. The pharmacokinetic data showed higher C_{max} and almost doubled AUC compared with raw SMV-loaded films.
Conclusion: The two-step optimization implemented to optimize and control the experimental conditions for the preparation of SMV-SNEDDS-transdermal film with improved ex vivo skin permeation and enhanced in vivo parameters.
Keywords: Fractional factorial design; SNEDDS; Mixture design; Simvastatin; Transdermal film.

1315. Phenylalanine-free Taste-masked Orodispersible Tablets of Fexofenadine Hydrochloride: Development, in Vitro Evaluation and in Vivo Estimation of the Drug Pharmacokinetics in Healthy Human Volunteers

Soad Ali Yehia, Mohamed Shafik El-Ridi, Mina Ibrahim Tadros and Nolwa Gamal El-Sherif

Context: Fexofenadine hydrochloride (FXD) is a slightly soluble, bitter-tasting, drug having an oral bioavailability of 35%. The maximum plasma concentration is reached 2.6 h T_{max} post-dose.

Objective: Developing taste-masked FXD orodispersible tablets (ODTs) to increase extent of drug absorption and reduce T_{max}.
Methods: Taste masking was achieved via solid dispersion (SD) with chitosan (CS) or sodium alginate (ALG). Fourier transform infrared spectroscopy, differential scanning calorimetry and X-ray diffraction were performed to identify physicochemical interactions and FXD crystallinity. Taste-masked FXD-ODTs were developed via addition of superdisintegrants (croscarmellose sodium or sodium starch glycolate, 5% and 10%, w/w) or sublimable agents (camphor, menthol or thymol; 10% and 20%, w/w) to FXD-SDs. ODTs were evaluated for weight variation, drug-content, friability, wetting, disintegration and drug release. Camphor-based (20%, w/w) FXD-ODT (F12) was optimized (F23) by incorporation of a more hydrophilic lubricant Pruv®, visualized via scanning electron microscopy and evaluated for FXD pharmacokinetics in healthy volunteers relative to Allegra® tablets.
Results: Based on gustatory sensation test, FXD-CS (1:1) and FXD-ALG (1:0.5) SDs were selected. Taste-masked FXD-ODTs had appropriate physicochemical properties. Drug release profiles of F23 and the phenylalanine-containing Allegra® ODT were similar ($f_2 = 96$). Pores were observed following camphor sublimation. The pharmacokinetic studies proved F23 ability to increase extent of FXD absorption and reduce T_{max}.
Keywords: Drug pharmacokinetics; Fexofenadine hydrochloride; Orodispersible tablets; Phenylalanine-free; Taste-masking.

1316. Radioiodinated Anastrozole and Epirubicin as Potential Targeting Radiopharmaceuticals for Solid Tumor Imaging

A. B. Ibrahim, T. M. Sakr, O. M. A. Khoweysa, M. A. Motaleb, A. Abd El-Bary and M. T. El-Kolaly

This study describes the preparation of radioiodinated anastrozole and epirubicin and their biological evaluation as potential solid tumor imaging gents. Radioiodinated anastrozole and epirubicin were successfully prepared via direct electrophilic substitution reaction at ambient temperature. The radiochemical yields for radioiodinated anastrozole and epirubicin were maximized to 92.9 ± 0.1 and 98.8 ± 0.1 %, respectively by studying different reaction parameters such as substrate amount, chloramine-T, pH of the reaction mixture, reaction temperature and reaction time. They showed in vitro stability up to 4 and 24 h, respectively. The preclinical evaluation and biodistribution in mice bearing solid tumor showed high retention and biological accumulation in solid tumor cells (12.4 and 25.3 % injected activity/g tissue) and high T/NT ratio equal to 4.7 ± 0.1 and 5.2 ± 0.1 at 2 and 1 h post-injection, respectively. Data described before could recommend radioiodinated anastrozole and radioiodinated epirubicin as potential targeting radiopharmaceuticals for solid tumor imaging.
Keywords: Anastrozole; Epirubicin; Radioiodination; Solid tumor; Targeting.

1317. Preliminary Assessment of Radioiodinated Fenoterol and Reproterol as Potential Scintigraphic Agents for Lung Imaging

M. M. Swidan, T. M. Sakr, M. A. Motaleb, A. Abd El-Bary and M. T. El-Kolaly

Radioiodinated fenoterol and reproterol were prepared by electrophilic radioiodination reaction using chloramin-T as oxidizing agent with radiochemical yields of 97.7 ± 0.7 and 95.2 ± 0.3 %, respectively, and in vitro stability up to 72 h. Biodistribution study performed in male Albino Swiss mice showed maximum radioactivity accumulation in lungs tissue to the extent of 52 ± 1.03 and 50.6 ± 1.2 % ID/g at 15 and 30 min post injection (p.i.) for radioiodinated fenoterol and reproterol, respectively, with low accumulation in heart and blood. The clearance pathway of both iodo-compounds was through renal and hepatobiliary routes. The selectivity of iodo-compounds to lung was examined by in vivo receptor blocking study. Radioiodinated fenoterol and reproterol are not a blood products and so they are more safer than the currently available 99mTc-MAA, and their lungs uptake is higher than that of the recently discovered $^{125/123}$I-IPMPD, ^{99m}Tc(CO)5I, ^{99m}Tc-DHPMand $^{125/123}$I-paroxetine. So, radioiodinated fenoterol and reproterol could be introduced as a new compromising radiopharmaceuticals for lung perfusion scintigraphy more safe than the currently available ^{99m}Tc-MAA and more potential than the recently discovered $^{125/123}$I-IPMPD, ^{99m}Tc(CO)5I, ^{99m}Tc-DHPM and $^{125/123}$I-paroxetine.
Keywords: Fenoterol; Reproterol; Radioiodination; Chloramin-T; Lung perfusion scanning.

1318. Modeling, Optimization, and in Vitro Corneal Permeation of Chitosan-Lomefloxacin HCl Nanosuspension Intended for Ophthalmic Delivery

Ahmed Abdelbary Abdelrahman and Heba Farouk Salem and Rasha Abd El-Salam Khallaf and Ahmed Mahmoud Abd El-Haleem Ali

Lomefloxacin HCl (LF) is a widely used fourthgeneration fluoroquinolone antibiotic. Like most drug solutions administered via ocular route, it is usually eliminated by eye protective mechanisms. Chitosan (CS) is a natural polysaccharide polymer with numerous advantages in ocular delivery with, antibacterial, and antifungal properties. The aims were to formulate and optimize LF nanosuspensions (NS) with enhanced antimicrobial activity and prolonged duration using ionic gelation technique. Formulation variables included drug load, CS concentration, crosslinker type (tripolyphosphate and sodium alginate), and concentration. Nanosuspension properties (particle size, zeta potential, polydispersity index, entrapment efficiency, drug release, and permeation through bovine cornea) were evaluated. The artificial neural networks (ANNs) model showed optimum entrapment efficiency of 70.63 % w/w, particle size of 176±0.28 nm, and zeta potential of 13.65 mV. Transmission electron microscopy illustrated the production of well-defined spherical nanoparticles. The nanosuspensions showed prolonged release of LF for more than 8 h and threefold increase in amount permeated

through bovine cornea compared to drug solution. Improved antibacterial activity of the nanosuspension was noted where 2- and 3.5-fold decrease in minimum inhibitory concentration (MIC) of drug against Gram-positive and Gram-negative bacteria were observed, respectively. Twofold decrease in minimum bactericidal concentration (MBC) of drug nanosuspension against both types of bacteria was also demonstrated. Histopathological examination showed compatibility of optimized formulation with eye tissues in rabbit model. Therefore, model-optimized LF nanosuspension could be an ideal solution to ocular infections by virtue of their augmented activity, high compatibility, and improved permeability.

Keywords: Antibacterial activity; Chitosan; Ionic gelation; Lomefloxacin HC1; Nanosuspension optimization; Transcorneal permeation.

Dept. of Pharmacognosy

1319. Role of Bacterial Volatile Compounds in Bacterial Biology

Bianca Audrain, Mohamed A. Farag, Choong-Min Ryu and Jean-Marc Ghigo

Bacterial interactions with neighboring microorganisms via production of small metabolites enable bacteria to respond and adapt to environmental changes. The study of intercellular interactions primarily focused on soluble metabolites, but bacteria also produce and release into their headspace a wide variety of volatile secondary metabolites, the ecological roles of which have generally been overlooked. However, bacterial volatile compounds are known to contribute to interkingdom interactions (plant, fungi and nematodes), and recent studies also identified their at-a-distance influence on bacterial behavior. The present review describes the biological roles of bacterial volatile compounds in inter-and intraspecies bacterial interactions, a new and yet unexplored research area, with potential clinical and industrial applications.

Keywords: Bacterial volatile compounds; Antibiotic resistance; Biofilm; Pathogenesis.

1320. O-methyltransferases Involved in Biphenyl and Dibenzofuran Biosynthesis

Mohammed N. A. Khalil, Wolfgang Brandt, Till Beuerle, Dennis Reckwell, Josephine Groeneveld, Robert H€ansch, Mariam M. Gaid, Benye Liu and Ludger Beerhues

Biphenyls and dibenzofurans are the phytoalexins of the Malinae involving apple and pear. Biosynthesis of the defence compounds includes two O-methylation reactions. cDNAs encoding the O-methyltransferase (OMT) enzymes were isolated from rowan (Sorbus aucuparia) cell cultures after treatment with an elicitor preparation from the scab-causing fungus, Venturia inaequalis. The preferred substrate for SaOMT1 was 3,5-dihydroxybiphenyl, supplied by the first pathway-specific enzyme, biphenyl synthase (BIS). 3,5-Dihydroxybiphenyl underwent a single methylation reaction in the presence of S-adenosyl-l-methionine (SAM).

The second enzyme, SaOMT2, exhibited its highest affinity for noraucuparin, however the turnover rate was greater with 5-hydroxyferulic acid. Both substrates were only methylated at the meta-positioned hydroxyl group.

The substrate specificities of the OMTs and the regiospecificities of their reactions were rationalized by homology modeling and substrate docking. Interaction of the substrates with SAM also took place at a position other than the sulfur group. Expression of SaOMT1, SaOMT2 and SaBIS3 was transiently induced in rowan cell cultures by the addition of the fungal elicitor. While the immediate SaOMT1 products were not detectable in elicitor-treated cell cultures, noraucuparin and noreriobofuran accumulated transiently, followed by increasing levels of the SaOMT2 products aucuparin and eriobofuran. SaOMT1, SaOMT2 and SaBIS3 were N- and C-terminally fused with the super cyan fluorescent protein and a modified yellow fluorescent protein, respectively.

All the fluorescent reporter fusions were localized to the cytoplasm of Nicotiana benthamiana leaf epidermis cells. A revised biosynthetic pathway of biphenyls and dibenzofurans in the Malinae is presented.

Keywords: O-methyltransferase; Biphenyl and dibenzofuran biosynthesis; Phytoalexins; Malinae; Sorbus aucuparia; Kc903137 (SaOMT1); Kc903138 (SaOMT2).

1321. Profiling of Phenolic and Other Compounds From Egyptian Cultivars of Chickpea (Cicer Arietinum L.) and Antioxidant Activity: A Comparative Study

Reham Hassan Mekky, Mar´ıa del Mar Contreras, Mohamed Roshdi El-Gindi, Azza R. Abdel-Monem, Essam Abd El-Sattar and Antonio Segura-Carretero

Chickpeas are basic food in many countries with several cultivars distributed all over the world. However, little is known about their secondary metabolites. Thus, this work is focused on the study of the phenolic profiles of seven Egyptian cultivars of chickpea. Selecting the most appropriate extraction method and analytical conditions using reversed-phase high-performance liquid chromatography-diode array detection, with a core–shell column, and coupled with quadrupole-time-of-flight-mass spectrometry (MS), a total of 96 phenolic compounds were characterized based on their retention time, UV spectra, and accurate MS and MS^2 data. Among them, the major phenolic subclasses were hydroxybenzoic acids and flavonoids. Moreover, other minor and major metabolites including organic acids, amino acids, nucleosides, peptides and soyasaponins were characterized. Using standards, 22 compounds were unequivocally identified. Remarkably, 88 of these compounds were tentatively reported for the first time in chickpeas. The total phenol content of the cultivars was determined as well as the antioxidant activity by the trolox equivalent antioxidant capacity assay.

Keywords: Chickpea; Cicer arietinum L; MS; Phenolic profile; HPLC.

Medicine Sector

1322. Integrated Comparative Metabolite Profiling Via MS and NMR Techniques for Senna Drug Quality Control Analysis

Mohamed A. Farag, Andrea Porzel, Engy A. Mahrous, Mo'men M. El-Massry and Ludger A.Wessjohann

Senna alexandrina Mill Cassia acutifolia and Cassia angustifolia) are used for the laxative medicine Senna. Leaves and pods from two geographically different sources were distinguished from each other via proton nuclear magnetic resonance (1H-NMR) and ultra performance liquid chromatography-mass spectrometry (UPLC-MS) analysis. Under optimized conditions, we were able to simultaneously quantify and identify 107 metabolites including 21 anthraquinones, 24 bianthrones (including sennosides), 5 acetophenones, 25 C/O-flavonoid conjugates, 5 xanthones, 3 naphthalenes, 2 further phenolics, and 9 fatty acids. Principal component analysis (PCA) and hierarchical clustering analysis (HCA) were used to define both similarities and differences among samples. For sample classification based on tissue type (leaf and pod), both UPLC-MS and NMR were found to be more effective in separation than on geographical origin. Results reveal that the amounts of the major classes of bioactives in Senna, i.e., flavonoids and sennosides, varied significantly among organs. Leaves contained more flavonoids and omega-3 fatty acids but fewer benzophenone derivatives than pods. In contrast, pods were more enriched in bianthrones (sennosides). PCA analysis was found to be equally effective in predicting the origin of the commercial Senna preparation using NMR and/or UPLC-MS datasets. Furthermore, a selection of six so far uninvestigated Senna species were analyzed by UPLC-MS. Results revealed that the Senna alata leaf in terms of secondary metabolite composition is the most closely related species to S. alexandrina Mill, showing the highest levels of the anthraquinone "rhein" and flavonoid conjugates. To the best of our knowledge, this study provides the first approach utilizing both UPLC-MS and NMR to reveal secondary metabolite compositional differences among Senna species.

Keywords: Senna alexandrina; S. bicapsularis; S. corymbosa; S. didymobotrya; S. alata; S. sophera; Nmr; UPLC-MS; Sennosides; Principal component analysis; Laxative.

1323. Aldose Reductase Inhibition of A Saponin Fraction and New Furostanol Saponin Derivatives from Balanites A Egyptiaca

Abd El-Motaal A., El-Askary H., Crockett S., Kunert O., Sakr B., Shaker S., Grigore A., Albulescu R. and Bauer R.

Background: Balanites aegyptiaca Del. (Zygophyllaceae) fruits are used to treat hyperglycemia in Egyptian folk medicine and are sold by herbalists in the Egyptian open market for this purpose. Nevertheless, the fruits have not yet been incorporated into pharmaceutical dosage forms. The identity of the bioactive compounds and their possible mechanisms of action were not well understood until now.

Purpose: Aldose reductase inhibitors are considered vital therapeutic and preventive agents to address complications caused by hyperglycemia. The present study was carried out to identify the primary compounds responsible for the aldose reductase inhibitory activity of Balanites aegyptiaca fruits.

Study Design: The 70% ethanolic extract of Balanites aegyptiaca fruit mesocarp and its fractions were screened for inhibition of the aldose reductase enzyme. Bio-guided fractionation of the active butanol fraction was performed and the primary compounds present in the saponin-rich fraction (D), which were responsible for the inhibitory activity, were characterized. HPLC chromatographic profiles were established for the different fractions, using the isolated compounds as biomarkers.

Methods: Aldose reductase inhibition was tested in vitro on rat liver homogenate. The butanol fraction of the 70% ethanolic extract was fractionated using vacuum liquid chromatography (VLC, RP-18 column). The most active sub-fraction D, which was eluted with 75% methanol, was subjected to preparative HPLC to isolate the bioactive compounds.

Results: The butanol fraction displayed inhibitory activity against the aldose reductase enzyme ($IC_{50} = 55.0 \pm 6$ µg/ml). Sub-fraction D exhibited the highest inhibitory activity (IC50 = 12.8 ± 1 µg/ml). Five new steroidal saponin derivatives were isolated from this fraction. The isolated compounds were identified as compound 1a/b, a 7:3 mixture of the 25R:25S epimers of 26-O-β-D-glucopyranosyl-furost-5-ene-3,22,26-triol3-O-[α-L-rhamnopyranosyl-(1→3)- β-D-glucopyranosyl-(1→2)]- α-L-rhamnopyranosyl-(1→4)-β-D-glucopyranoside; compound 2, 26-O-β-D-glucopyranosyl-(25R)-furost-5-ene-3,22,26-triol 3-O-[β-D-glucopyranosyl-(1→2)]- α-L-rhamnopyranosyl-(1→4)-β-D-glucopyranoside; compound 3, 26-O-β-D-glucopyranosyl-(25R)-furost-5,20-diene-3,26-diol 3-O-[α-L-rhamnopyranosyl-(1→3)-β-D-glucopyranosyl-(1→2)]- α-L-rhamnopyranosyl-(1→4)-β-D-glucopyranoside; compound 4, 26-O-β-D-glucopyranosyl-(25R)-furost-5,20-diene-3,26-diol 3-O-[β-D-glucopyranosyl-(1→2)]- α-L-rhamnopyranosyl-(1→4)-β-D-glucopyranoside; and compound 5, which is the 25S epimer of compound 4, by using various spectroscopic methods [MS,1D and 2D NMR (HSQC, HMBC, DQF-COSY, HSQC-TOCSY)]. Compounds 1a/b, 2, 3, 4, 5 exhibited highly significant aldose reductase inhibitory activities (IC50 values were 1.9 ± 0.2, 1.3 ± 0.5, 5.6 ± 0.2, 5.1 ± 0.4, 5.1 ± 0.6 µM, respectively) as compared to the activity of the reference standard quercetin (IC50 = 6.6 ± 0.3 µM).

Conclusion: The aldose reductase inhibitory activity of Balanites fruits is due to the steroidal saponins present. HPLC chromatographic profiles of the crude butanol fraction and its 4 sub-fractions showed that the most highly bioactive fraction D contained the highest amount of steroidal saponins (75%) as compared to the 21% present in the original butanol fraction. The isolated furostanol saponins proved to be highly active in an in vitro assay.

Keywords: Aldose reductase; Balanites aegyptiaca; Diabetes; Furostane; Preparative HPLC; Zygophyllaceae.

1324. Phytochemical, Antioxidant and Antidiabetic Evaluation of Eight Bauhinia L. Species From Egypt Using UHPLC–PDA–qTOF-MS and Chemometrics

Mohamed A. Farag, Sarah T. Sakna, Nabaweya M. El-Fiky, Marawan M. Shabana and Ludger A. Wessjohann

Bauhinia L. (Fabaceae) comprises ca. 300–350 plant species, many of which are traditionally used in folk medicine for their antidiabetic, antioxidant and anti-inflammatory effects. Bauhinia

s.l. recently has been subdivided into 9 genera based on phylogenetic data: Bauhinia s.str., Barklya, Brenierea, Gigasiphon, Lysiphyllum, Phanera, Piliostigma, Schnella (American Phanera) and Tylosema. The aerial parts of 8 species corresponding to 5 genera were analyzed: Bauhinia forficata, Bauhinia variegata, B. variegata var. candida, Bauhinia galpinii, Schnella glabra, Piliostigma racemosa, Phanera vahlii and Lysiphyllum hookeri. Leaves and shoots were subjected to metabolite profiling via UHPLC–PDA–qTOF-MS coupled to multivariate data analyzes to identify compound compositional differences. A total of 90 metabolites were identified including polyphenols and fatty acids; flavonoid conjugates accounted for most of the metabolite variation observed. This study provides a comprehensive map of polyphenol composition in Bauhinia and phytochemical species aggregations are consistent with recent Bauhinia genus taxonomic relationship derived from phylogenetic studies. DPPH radical scavenging and α -glucosidase inhibitory assays were also performed to assess selected aspects of the antioxidant and antidiabetic potential for the examined species with respect to metabolite profiles.

Keywords: Bauhinia; Chemotaxonomy; Flavonoids; Multivariate data analysis; UHPLC-MS; α -glucosidase inhibition.

1325. P-glycoprotein Inhibitors of Natural Origin as Potential Tumor Chemo-sensitizers: A Review

Hossam M. Abdallah, Ahmed M. Al-Abd, Riham Salah El-Dine and Ali M. El-Halawany

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Resistance of solid tumors to treatment is significantly attributed to pharmacokinetic reasons at both cellular and multi-cellular levels. Anticancer agent must be bio-available at the site of action in a cytotoxic concentration to exert its proposed activity. P-glycoprotein (P-gp) is a member of the ATP-dependent membrane transport proteins; it is known to pump substrates out of cells in ATP-dependent mechanism. The over-expression of P-gp in tumor cells reduces the intracellular drug concentrations, which decreases the cytotoxicity of a broad spectrum of antitumor drugs. Accordingly, P-gp inhibitors/blockers are potential enhancer for the cellular bioavailability of several clinically important anticancer drugs such as, anthracyclines, taxanes, vinca alkaloids, and podophyllotoxins. Besides several chemically synthesized P-gp inhibitors/blockers, some naturally occurring compounds and plant extracts were reported for their modulation of multidrug resistance; however, this review will focus only on major classes of naturally occurring inhibitors viz., flavonoids, coumarins, terpenoids, alkaloids and saponins.

Keywords: Multidrug resistance (MDR); Multidrug resistance-associated protein1 (MRP1); Natural products; P-gp (P-glycoprotein).

1326. Unequivocal Glycyrrhizin Isomer Determination and Comparative in Vitro Bioactivities of Root Extracts in Four Glycyrrhiza Species

Mohamed A. Farag, Andrea Porzel and Ludger A. Wessjohann

Journal of Advanced Research, 6: 99-104 (2015) IF: 3

Glycyrrhiza glabra, commonly known as licorice, is a popular herbal supplement used for the treatment of chronic inflammatory conditions and as sweetener in the food industry. This species contains a myriad of phytochemicals including the major saponin glycoside glycyrrhizin (G) of Glycyrrhetinic acid (GA) aglycone. In this study, 2D-ROESY NMR technique was successfully applied for distinguishing 18a and 18 glycyrrhetinic acid (GA). ROESY spectra acquired from G. glabra, Glycyrrhiza uralensis and Glycyrrhiza inflata crude extracts revealed the presence of G in its -form. Anti-inflammatory activity of four Glycyrrhiza species, G, glabra, G. uralensis, G. inflata, and G. echinata roots was assessed against COX-1 inhibition revealing that phenolics rather than glycyrrhizin are biologically active in this assay. G. inflata exhibits a strong cytotoxic effect against PC3 and HT29 cells lines, whereas other species are inactive. This study presents an effective NMR method for G isomer assignment in licorice extracts that does not require any preliminary chromatography or any other purification step.

Keywords: G. glabra; G. inflata; G. uralensis; Glycyrrhizin; Licorice; Roesy.

1327. Two Dimensional NMR Spectroscopy Approaches for Exploring Plant Metabolome: A Review

Engy A. Mahrous and Mohamed A. Farag

Journal of Advanced Research, 6: 3-15 (2015) IF: 3

Today, most investigations of the plant metabolome tend to be based on either nuclear magnetic resonance (NMR) spectroscopy or mass spectrometry (MS), with or without hyphenation with chromatography. Although less sensitive than MS, NMR provides a powerful complementary technique for the identification and quantification of metabolites in plant extracts. NMR spectroscopy, well appreciated by phytochemists as a particularly information-rich method, showed recent paradigm shift for the improving of metabolome(s) structural and functional characterization and for advancing the understanding of many biological processes. Furthermore, two dimensional NMR (2D NMR) experiments and the use of chemometric data analysis of NMR spectra have proven highly effective at identifying novel and known metabolites that correlate with changes in genotype or phenotype. In this review, we provide an overview of the development of NMR in the field of metabolomics with special focus on 2D NMR spectroscopic techniques and their applications in phytomedicines quality control analysis and drug discovery from natural sources, raising more attention at its potential to reduce the gap between the pace of natural products research and modern drug discovery demand.

Keywords: Nuclear magnetic resonance (NMR); Phytomedicines; Drug discovery; 2D NMR; Metabolomics; Chemometrics.

1328. Unraveling the Active Hypoglycemic Agent Trigonelline in Balanites Aegyptiaca Date Fruit Using Metabolite Fingerprinting by NMR

Mohamed A. Farag, Andrea Porzel and Ludger A. Wessjohann

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Medicine Sector

Trigonelline (3-carboxy-1-methyl pyridinium) was identified as a relevant bioactivity and taste imparting component in Balanites aegyptiaca fruit, using ^{1}H NMR of crude extracts without any fractionation or isolation step. The structural integrity of trigonelline was established within the extract matrix via[1]H NMR, ^{1}H-^{1}H COSY, HMQC and HMBC and by comparison with authentic standard. A quantitative[1]H NMR method (qHNMR) was used to determine trigonelline concentrations in the peel and pulp of B. aegyptiaca fruit of 8 and 13 mg g^{-1}, respectively. Trigonelline so far has not been reported from B. aegyptiaca or its genus as it easily escapes LC-MS based detection. Its discovery provides novel insight into the balanite fruits antidiabetic properties as the compound is known for a pronounced hypoglycemic effect. In addition, it is likely to impart the perceptible bitter taste portion to balanites sweet bitter taste. UPLC-MS of the crude extract additionally revealed the fruit flavonoid pattern showing quercetin/isorhamnetin flavonol conjugates in addition to epicatechin, the latter being present at much lower levels.

Keywords: Balanites aegyptiaca; NMR fingerprinting; Alkaloid; Trigonelline; Antidiabetic natural product.

1329. Volatiles and Primary Metabolites Profiling in Two Hibiscus Sabdariffa (Roselle) Cultivars Via Headspace SPME-GC-MS and Chemometrics

Mohamed A. Farag, Dalia M. Rasheed and Islam M. Kamal

Hibiscus sabdariffa (roselle) is a plant of considerable commercial importance worldwide as functional food due to its organic acids, mucilage, anthocyanins, macro and micro-nutrients content. Although Hibiscus flowers are emerging as very competitive targets for phytochemical studies, very little is known about their volatile composition and or aroma, such knowledge can be suspected to be relevant for understanding its olfactory and taste properties. To provide insight into Hibiscus flower aroma composition and for its future use in food and or pharmaceutical industry, volatile constituents from 2 cultivars grown in Egypt, viz. Aswan and Sudan-1 were profiled using solid-phase microextraction (SPME) coupled to GCMS. A total of 104 volatiles were identified with sugar and fatty acid derived volatiles amounting for the major volatile classes. To reveal for cultivar effect on volatile composition in an untargeted manner, multivariate data analysis was applied. Orthogonal projection to latent structures-discriminant analysis (OPLS-DA) revealed for 1-octen-3-ol versus furfural/acetic acid enrichment in Aswan and Sudan-1 cvs., respectively. Primary metabolites contributing to roselle taste and nutritional value viz. sugars and organic acids were profiled using GC-MS after silylation. The impact of probiotic bacteria on roselle infusion aroma profile was further assessed and revealed for the increase in furfural production with Lactobacillus plantarum inoculation and without affecting its anthocyanin content. This study provides the most complete map for volatiles, sugars and organic acids distribution in two Hibiscus flower cultivars and its fermented product.

Keywords: Hibiscus sabdariffa; Lactobacillus plantarum; Volatiles; SPME; Chemometrics; Sugars.

1330. Mechanistic Evidence of Passiflora Edulis (Passifloraceae) Anxiolytic Activity in Relation to its Metabolite Fingerprint as Revealed Via LC-MS and Chemometrics

Asmaa Otify, Camilia George, Aly Elsayed and Mohamed A. Farag

Passiflora edulis Sims F. flavicarpa along with several other plants belonging to the genus Passiflora have been reported as sedatives and for treatment or prevention of central disorders. This study evaluated the anxiolytic effect of P. edulis ethanol extract and its fractions (viz. chloroform, ethyl acetate and butanol) using the elevated plus-maze model of anxiety and assessment of γ-aminobutyric acid levels. The results revealed that butanol and chloroform extracts exhibit the strongest effect followed by ethyl acetate suggesting that a combination of different classes of metabolites is likely to mediate for P. edulis anxiolytic effect in these fractions. To further pinpoint bioactive agents in fractions, ultra-performance liquid chromatography (UPLC) coupled to high resolution qTOF-MS was used for secondary metabolite profiling. A total of 65 metabolites were characterized including O-flavonoids, C-flavonoids, cyanogenic glycosides and fatty acids. Harman type alkaloids found in P. incarnata were not detected in P. edulis ethanol extract or any of its fractions suggesting that they do not mediate for its CNS modulating effects. Multivariate data analysis (PCA) was further applied to identify metabolite markers for fractions and revealed that enrichment of C-glycoside type flavonoids in chloroform/ethyl acetate fractions versus the exclusive presence of cyanogenic glycosides in its butanol fraction.

Keywords: Passiflora; Anxiolytic; PCA.

1331. Mechanistic Evidence of Viscum Schimperi (Viscaceae) Antihyperglycemic Activity: from A Bioactivity-guided Approach to Comprehensive Metabolite Profiling

Hossam M. Abdallah, Mohamed A. Farag, Ashraf B. Abd El-Naim, Salah A. Ghareib and Essam A. Abd El-Sattar

Diabetes mellitus is possibly the world's largest growing metabolic disorder. Effective treatment of diabetes is increasingly dependent on active constituents of medicinal plants capable of controlling hyperglycemia as well as its secondary complications. Viscum schimperi Engl. is a plant growing in Saudi Arabia and known for its antidiabetic activity. The potential antidiabetic activity of its methanol extract as well as its chloroform, n-butanol, and the remaining water fractions was evaluated in streptozotocin-induced diabetic rats at two dose levels. The antidiabetic activity was assessed through the determination of fasting blood glucose level, insulin levels, area under the curve (AUC) in oral glucose tolerance test, glucose absorption in isolated rat gut assay, and glucose uptake by psoas muscle. Moreover, large-scale untargeted metabolite profiling of methanol extract was performed via (UPLC-PDA and qTOF-MS) ultra-performance liquid chromatography photodiode array detection and quadrupole time-of-flight mass spectrometry, respectively, to explore its chemical composition and standardization of its extract. Multivariate statistical analysis including principal component analysis and orthogonal projection to latent structures

discriminant analysis was used to determine bioactives in its fractions. In conclusion, oleanane triterpenes and O-caffeoyl quinic acid conjugates were the major compounds that might account for antihyperglycemic effect of the plant.

Keywords: Induced diabetic-rats; Oleanolic acid; Extract; Fructose; Mice.

1332. Scalarane Sesterterpenes from the Egyptian Red Sea Sponge Phyllospongia Lamellosa

Marwa H.A. Hassan, Mostafa E. Rateb, Mona Hetta, Tarek A. Abdelaziz, Mohamed A. Sleim, Marcel Jaspars and Rabab Mohammed

Biology and HRESIMS-guided screening of the dichloromethane fraction of the marine sponge Phyllospongia lamellosa collected from the Red Sea resulted in the isolation and characterization of five new scalarane sesterterpenes; phyllospongins AeE (1e5), in addition to four known derivatives, 12α-acetoxy- 20,24-dimethyl-25-norscalar-16-en-24-one (6), 12α-acetoxy-13β,18β-cyclobutan-20,24-dimethyl-24- oxoscalar-16-en-25b-ol (7), 12α-acetoxy-24,25-epoxy-24-hydroxy-20,24-dimethylscalarane (8), and scalardysin-A(9) that were previously isolated from Carteriospongia sp. and Dysidea sp. The structures of the isolated compounds were fully characterized using NMR spectroscopic techniques and mass spectrometric analysis. All the isolated compounds were tested for their cytotoxic activity against human cancer cell lines (HePG-2, MCF-7, and HCT-116) and antibacterial activity against some Gram-positive and Gram-negative strains.

Keywords: Scalarane sesterterpenes phyllospongia lamellosa phyllospongin cytotoxic antibacterial.

1333. Anti-tuberculous Activity of Treponemycin Produced by A Streptomyces Strain MS-6-6 Isolated from Saudi Arabia

Mahmoud A. Yassien, Hossam M. Abdallah, Ali M. El-Halawany and Asif A. M. Jiman-Fatani

A Streptomyces strain MS-6-6 with promising anti-tuberculous activity was isolated from soil samples in Saudi Arabia. The nucleotide sequence of its 16S rRNA gene (1426 bp) evidenced a 100% similarity to Streptomyces mutabilis. Through an anti-tuberculous activity-guided approach, a polyketide macrolide was isolated and identified as treponemycin (TP). The structure of the isolated compound was determined by comprehensive analyses of its 1D and 2D NMR as well as HRESI-MS. In addition to the promising anti-tuberculous activity (MIC = 13.3 µg/mL), TP showed broad spectrum of activity against the Gram positive, Gram negative strains, and Candida albicans. Improvement of TP productivity (150%) was achieved through modification in liquid starch nitrate medium by replacing KNO_3 with corn steep liquor and yeast extract or tryptone, and removing $CaCO_3$ and K_2HPO_4. The follow up of TP percentage as well as its metabolites profile for each media was assessed by LC/DAD/MS.

Keywords: Streptomyces mutabilis; Treponemycin; Anti-tuberculous activity.

1334. Metabolomics Reveals Distinct Methylation Reaction in MeJA Elicited Nigella Sativa Callus Via UPLC-MS and Chemometrics

Mohamed A. Farag, Abeer M. El Sayed, Ahmed El Banna and Susanne Ruehmann

Cell suspension cultures are now recognized as important model for studying natural products biosynthesis and functional genomics. Nevertheless, very few studies of metabolic comparisons between cell cultures (callus) and original plants have been reported, even though the biological identity of cultured cells with the normally grown plant is of great importance. In this study, an MS-based metabolomic approach was used to compare the natural products profile of intact Nigella sativa seeds versus callus . N. sativa has been used for centuries in traditional medicine for several purposes. Its phytochemical components comprise, among others, alkaloids, saponins, flavonoids and fatty acids. Ultra performance liquid chromatography coupled to ultraviolet photodiode array detection and high resolution q-TOF mass spectrometry (UPLC-PDA-MS) was utilized to analyze the secondary product metabolome of N. sativa callus, with a total of 74 metabolites including five flavonoids, 13 hydroxycinnamates, an alkaloid, saponin and 14 fatty acids. Callus maintained the capacity to produce N. sativa phenolic subclasses, with hydroxycinnamates amounting for the major secondary metabolites in callus. Alkaloids, major constituents in Nigella genus, were detected in callus though with qualitative and quantitative differences from seed tissue. Methyl jasmonate (MeJA) elicitation effect was assessed on callus with the aim of increasing secondary metabolites production. Metabolite profiles were subjected to principal component analysis and orthogonal projection to latent structures-discriminant analysis to evaluate MeJA effect. Results revealed that MeJA led to O-methylation reaction induction yielding O-feruloylquinic acid from O-caffeoylquinic acid, in addition to a methylated disaccharide. The work extends our knowledge regarding hydroxycinnamates biosynthesis, regulation and on metabolic engineering future efforts to increase its production as potential phytoalexin in N. sativa.

Keywords: Nigella sativa; Metabolomics; Cell culture; O-feruloylquinic acid; Methyl jasmonate; UPLC-MS; Phytoalexins.

1335. Calligonum Comosum Extract Inhibits Diethylnitrosamine-Induced Hepatocarcinogenesis in Rats

Walied Abdo, Akihiro Hirata, Mostafa Shukry, Tarek Kamal, Essam Abd El-Sattar, Engi Mahrous and Tokuma Yanai

Calligonum comosum (C. comosum) is an Egyptian desert plant that contains polyphenol antioxidants. The present study examined the chemopreventive effect of an extract of C. comosum in a rat model of hepatocarcinogenesis. Male Wistar rats (n=40) were administered 100.mg/kg diethylnitrosamine (DEN) by intraperitoneal (i.p.) injection once a week for 3 weeks. Subsequently, depending on whether the rats received further administration of 0.8 mg/kg carbon tetrachloride (CCl_4).i.p. once a week.for 7 weeks and 100 mg/kg C. comosum extract in their

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diet for 7 weeks, the rats were divided into four groups as follows: Group I, treatment with DEN alone; group 2, treatment with DEN and C. comosum extract; group 3, treatment with DEN and CC1$_4$; and group 4, treatment with DEN, CCI$_4$ and C. comosum extract. The supplementation of C. comosum extract significantly suppressed the elevation in serum liver enzyme levels, including aspartate aminotransferase, alanine transaminase and y-glutamy.1 transferase, and reduced the degree of oval cell proliferation induced by DEN and CCL. In addition, C. comosum extract significantly decreased the number and area of glutathione 5-transferase placental form-positive preneoplastic hepatic foci induced by DEN, with or without CCL treatment. To the best of our knowledge, the present study is the.first to provide definitive evidence of the hepatoprotective and chemopreventive effects of C. comosum.

Keywords: Calligonum comosum; Diethylnitrosam NE; Liver; Rat; Glutathione s-transferase placental form; Oval cell proliferation.

1336. Structure-Activity Relationships of Antimicrobial Gallic Acid Derivatives from Pomegranate and Acacia Fruit Extracts Against Potato Bacterial Wilt Pathogen

Mohamed A. Farag, Dalia A. Al-Mahdy, Riham Salah El-Dine, Sherifa Fahmy, Aymen Yassin, Andrea Porzel and Wolfgang Brandt

Chemistry and Biodiversity, 12: 955-962 (2015) IF: 1.515

Bacterial wilts of potato, tomato, pepper, and or eggplant caused by Ralstonia solanacearum are among the most serious plant diseases worldwide. In this study, the issue of developing bactericidal agents from natural sources against R. solanacearum derived from plant extracts was addressed. Extracts prepared from 25 plant species with antiseptic relevance in Egyptian folk medicine were screened for their antimicrobial properties against the potato pathogen R. solancearum by using the disc-zone inhibition assay and microtitre plate dilution method. Plants exhibiting notable antimicrobial activities against the tested pathogen include extracts from Acacia arabica and Punica granatum. Bioactivity-guided fractionation of A. arabica and P. granatum resulted in the isolation of bioactive compounds 3,5-dihydroxy-4-methoxybenzoic acid and gallic acid, in addition to epicatechin. All isolates displayed significant antimicrobial activities against R. solanacearum (MIC values 0.5-9 mg/ml), with 3,5-dihydroxy-4-methoxybenzoic acid being the most effective one with a MIC value of 0.47 mg/ml. We further performed a structure-activity relationship (SAR) study for the inhibition of R. solanacearum growth by ten natural, structurally related benzoic acids.

Keywords: Natural phenolic-compounds; Plant essential oils; Ralstonia-solanacearum; Antibacterial activity; Resistance; Tomato; Constituents; Disease.

1337. Anti-Inflammatory Activity of Flavonoids from Chrozophora Tinctoria

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Phytochemistry Letters, 13: 74-80 (2015) IF: 1.45

Chemical investigation of Chrozophora tinctoria (L.) A. Juss. growing in Saudi Arabia revealed the isolation of two new acylated flavonoids identified as acacetin-7-O-β-d-[α-l-rhamnosyl(1 → 6)]3″-E-p-coumaroyl glucopyranoside (4) and apigenin-7-O-(6″-Z-p-coumaroyl)-β-d-glucopyranoside (5), in addition to amentoflavone (1), apigenin-7-O-β-d-glucopyranoside (2), apigenin-7-O-6″-E-p-coumaroyl-β-d-glucopyranoside (3) and rutin (6). The structures of isolated compounds were established by 1D, 2D NMR and HRESIMS spectral data, in addition to comparison with literature data. The anti-inflammatory activities of isolated compounds were assessed by measuring the levels of IL-1β, IL-6, TNF-α and PGE$_2$ in the supernatant media of human peripheral blood mononuclear cells (PBMCs) stimulated by phytohaemagglutinin (PHA). At a concentration of 100 μM, compounds 1, 2, 4 and 6 significantly decreased Il-1β, Il-6 and PGE$_2$ to nearly normal values. All tested compounds caused a dose-dependent decrease in TNF-α level but failed to reach that of the control values.

Keywords: Euphorbiaceae; Acylated flavonoids; Acylated apigenin; Interleukin; Prostaglandin E2; TNF-α.

1338. Metabolites Profiling of Chrysanthemum Pacificum Nakai Parts Using UPLC-PDA-MS Coupled to Chemometrics

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Natural Product Research, 29: 1342-1349 (2015) IF: 0.919

Methanol-soluble constituents from the flowers, non-flowering aerial parts and roots of Chrysanthemum pacificum Nakai were analysed via high resolution UPLC-PDA$_-$ $_q$TOF- MS followed by chemometrics. Forty-seven chromatographic peaks belonging to various metabolite classes were detected. Most metabolite classes showed qualitative and quantitative differences across parts, with luteolin conjugates being mostly enriched in flowers whereas non-flowering aerial parts contained mostly quercetin and methoxylated flavone conjugates. Root sample ranked the lowest for all flavones and dicaffeoylquinic acids. In contrast, 1,5-di-caffeoylquinic acid levels were found at high levels in flowers and aerial parts reaching 3145 and 1390 mg/g, respectively, suggesting that C. pacificum could serve as a natural resource of this wellrecognised anti-hepatotoxic phenolic. Principal component analysis was further used for organs classification in an untargeted manner. This study provides the first map of secondary metabolites distribution in C. pacificum Nakai organs.

Keywords: Chrysanthemum pacificum; Metabolomics; UPLC/MS; Hydroxycinnamic acids; Chemometrics.

1339. A New Triterpene and Protective Effect of Periploca Somaliensis Browicz Fruits Against CCl$_4$-Induced Injury on Human Hepatoma Cell Line (Huh7)

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Natural Product Research, 29: 423-429 (2015) IF: 0.919

The potential hepatoprotective effect of the methanolic extract of Periploca somaliensis Browicz fruits, its different fractions (n-hexane, chloroform and n-butanol) and the major isolated

compound ursolic acid was evaluated using the human hepatoma cell line (Huh7) based on the changes in the activity of aspartate aminotransferase, alanine transaminase, glutathione and superoxide dismutase. Each sample was tested at three different concentrations (1000, 100 and 10 μg/mL). All tested samples exhibited a potent concentration-independent cytoprotective effect relative to silymarin as a reference standard. Chromatographic fractionation of the chloroform-soluble fraction of the methanol extract of P. somaliensis Browicz fruits afforded two known triterpenes, namely ursolic acid, and 11α,12α-epoxy-3β-hydroxy-olean-13β,28-olide, and a newly discovered one, namely 3β-hydroxy-urs-11-en-13β,28-olide. The structures of the isolated compounds were elucidated by the analysis of 1D and 2D NMR spectral data.

Keywords: Periploca somaliensis browicz; Triterpenes; Hepatoprotective; Huh7 cell line.

1340. Chemical Composition, Antimicrobial and Insecticidal Activities of the Essential Oils of Conyza Linifolia and Chenopodium Ambrosioides

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Natural Product Research, 29: 879-882 (2015) IF: 0.919

Two essential oil-containing plants growing wildly in Egypt: Conyza linifolia (Willd.) Tackh. (Asteraceae) and Chenopodium ambrosioides L. (Chenopodiaceae) were subjected to essential oil analysis and biological investigation. The essential oils from both plants were prepared by hydrodistillation, and GC/MS was employed for volatiles profiling. This study is the first to perform GC/MS analysis of C. linifolia essential oil growing in Egypt. C. linifolia essential oil contained mainly sesquiterpenes, while that of C. ambrosioides was rich in monoterpenes. Ascaridole, previously identified as the major component of the latter, was found at much lower levels. In addition, the oils were investigated for their antimicrobial activity against two Gram positive and two Gram negative bacteria, and one fungus. The insecticidal activities of both oils, including mosquitocidal and pesticidal potentials, were also evaluated. The results of biological activities encourage further investigation of the two oils as antimicrobial and insecticidal agents of natural origin.

Keywords: Insecticidal; Essential oil; Antimicrobial; Conyza linifolia; Chenopodium ambrosioides; GC-MS.

1341. Metabolomic Fingerprint Classification of Brachychiton Acerifolius Organs Via UPLC-qTOF-PDA-Ms Analysis and Chemometrics

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Natural Product Research, 29: 116-124 (2015) IF: 0.919

Brachychiton acerifolius, or Sterculia acerifolia as formerly known, is a member of a genus reported for a myriad of bioactive compounds. Metabolome analysis of B. acerifolius – leaves, flowers and seeds – and quantification of its major compounds are demonstrated in this study. Metabolites were analysed via UPLC-PDA-qTOF-(±) ESI-MS and UPLC/ITMS, with a total of 56 metabolites characterised including 30 flavonoids, 2 anthocyanins, 6 phenolic acids (i.e. citric and hydroxycitric acid

conjugates) and 8 fatty acids (FAs). Multivariate data analyses (i.e. principle component analysis and orthogonal partial least square-discriminate analysis) were applied to identify metabolite markers for each organ. Pelargonidin-O-glucoside and naringenin-O-glucuronide were found exclusively in flowers versus flavone enrichment in leaves (i.e. luteolin-O-glucuronide and apigenin-O-rhamnosyl glucuronide). Gas chromatography/ mass spectrometry analysis revealed the presence of toxic cyclopropene FAs in seeds which may restrict its use. Antioxidant activity assessment for the three organs was performed in comparison with vitamin C as positive control. Leaves showed the highest activity (IC$_{50}$ 0.015 mg/mL).

Keywords: Brachychiton acerifolius; UPLC/MS analysis; Chemometrics; Antioxidant activity;

1342. Bioassay-guided Fractionation of A Hepatoprotective and Antioxidant Extract of Pea by-product

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Natural Product Research, 29: 1578-1583 (2015) IF: 0.919

The hepatoprotective and antioxidant activities of the hydroalcoholic extract (PE) of pea (Pisum sativum L.) by-product were evaluated, using CCl4-induced oxidative stress and hepatic damage in rats. These activities were assessed by measuring alanine aminotransferase (ALT), aspartate aminotransferase (AST), total protein and albumin, malondialdehyde (MDA), reduced glutathione (GSH), protein thiols (PSH), nitrite/ nitrate levels, glutathione-peroxidase (GSH-Px), glutathione-S-transferase (GST) activities, as well as, histopathological evaluation. PE revealed significant hepatoprotective and antioxidant activities mostly found in n-butanol fraction. Chromatographic fractionation of this active fraction led to the isolation of five flavonoid glycosides namely, quercetin-3-O-sophorotrioside (1), quercetin-3-Orutinoside (2), quercetin-3-O-(6''''-O-E sinapoyl)-sophorotrioside (3), quercetin-3-O- (6'' ''-O-E feruloyl)-sophorotrioside (4) and quercetin-3-O-β-D-glucopyranoside (5). The isolated compounds were quantified in PE, using a validated HPLC method and the nutritional composition of pea by-product was also investigated. Our results suggest that pea by-product contained biologically active constituents which can be utilised to obtain high value added products for nutraceutical use.

Keywords: Antioxidant; Flavonoids; Hepatoprotective; Validated HPLC; PEA By-product.

1343. Headspace Analysis of Volatile Compounds Coupled to Chemometrics in Leaves from the Magnoliaceae Family

Mohamed A. Farag, Riham Salah El Din and Sherifa Fahmy

Records of Natural Products, 9: 153-158 (2015) IF: 0.868

Headspace volatile analysis has been used for volatiles profiling in leaves of 4 Magnolia species with a total of 75 compounds were identified. Monterpene hydrocarbons dominated the volatile blend of M. calophylla (86%), M. acuminata (78%), M. virginiana (70%) and M. grandiflora (47%) with I²-pinene and I²-ocimene occurring in the largest amounts, whereas sesquiterpenes were the

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most abundant compounds in M. grandiflora (39%). High levels of oxygenated compounds were only found in M. virginiana volatile blend (11.4%) with 2-phenylethyl alcohol as major component. Hierarchical cluster analysis performed on volatiles content revealed the close relationship between M. acuminata and M. calophylla.

Keywords: GC-MS; Magnolia acuminata; Magnolia calophylla; Magnolia grandiflora; Magnolia virginiana; Headspace volatiles; Hierarchical cluster analysis.

1344. Chemical Constituents from Solanum Glabratum Dunal Var. Sepicula

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Record of Natural Product, 9: 94-104 (2015) IF: 0.868

In the course of screening program of Saudi plants for their potential biological activity, the methanolic extract of Solanum glabratum Dunal var. sepicula as well as its different fractions were tested for its possible cytoxicity in prostate cancer (PC3) and colon cancer (HT29) cell lines using the MTT assay. In the present study, three spirostan saponins and one flavonoid glycoside were isolated from the active n-butanol fraction through a bio-guided fractionation approach. Two new saponin glycosides were identified as 23-β-D-glucopyranosyl (23S, 25R)-spirost-5-en-3, 23 diol 3-O-α-L-rhamnopyranosyl-(1→2)-O-[-L-α-rhamnopyranosyl- (1→4)]- β -D-glucopyranoside (2) and (25R)-spirost-5-en-3-ol3-O-α-L-rhamnopyranosyl-(1→2)-O-[-Dglucopyranosyl-(1→3)]- β -D-galactopyranoside (3). In addition, two known compounds were also isolated and identified as isorhamnetin-3-O--L-rhamnopyranosyl (1→6) -D- β -glucopyranoside (1) and (23S, 25R)-spirost-5- en-3, 23 diol 3-O--L-rhamnopyranosyl-(12)-O-α-L-rhamnopyranosyl-(1→4)]- β -D-glucopyranoside (4). The structures of the isolated compounds were elucidated based on their MS, one dimensional and extensive two dimensional NMR spectral data. Among the isolated metabolites, compound 3 showed the highest cytotoxic activity in both PC3 and HT29 cell lines with an IC$_{50}$ values of 14.8 and 19.5 µg/mL, respectively.

Keywords: Solanum glabratum; Steroidal saponins; Cytotoxicity; PC3; HT2.

1345. HPLC-DAD-MS/MS Profiling of Phenolics From Securigera Securidaca Flowers and its Anti-hyperglycemic and Anti-hyperlipidemic Activities

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Revista Brasileira De Farmacognosia, 25: 134-141 (2015) IF: 0.834

Securigera securidaca (L.) Degen and D ö efl., Fabaceae, has been widely used in the Iranian, Indian and Egyptian folk medicine as antidiabetic and anti-hyperlipidemic remedy. Phenolic profiling of the ethanolic extract (90%) of the flowers of S. securidaca was performed via HPLC-DAD-MS/MS analysis in the positive and negative ion modes. The total polyphenols and flavonoids in the flowers were determined colorimetrically, and the quantification of their components was carried out using HPLC-UV. Total phenolics and flavonoids estimated as gallic acid and rutin equivalents were 82.39 ± 2.79 mg/g and 48.82 ± 1.95 mg/g of the dried powdered flowers, respectively. HPLC-DAD-MS/MS analysis of the extract allowed the identification of 39 flavonoids and eight phenolic acids. Quantitative analysis of some flavonoids and phenolics (mg/100 g powdered flowers) revealed the presence of isoquercetrin (3340 ± 2.1), hesperidin (32.09 ± 2.28), naringin (197.3 ± 30.16), luteolin (10.247 ± 0.594), chlorogenic acid (84.22 ± 2.08), catechin (3.94 ± 0.57) and protocatechuic acid (34.4 ± 0.15), in the extract. Moreover, the acute toxicity, hypoglycemic and hypolipidemic effects of the extract were investigated using alloxan induced diabetes in rats in a dose of 100, 200, and 400 mg/kg bwt. The ethanolic extract was safe up to a dose of 2000 mg/kg. All tested doses of the flower extract showed marked decrease in blood glucose level by 31.78%, 66.41% and 63.8% at 100, 200 and 400 mg/kg bwt, respectively, at p < 0.05. Regarding the anti-hyperlipidemic effect, a dose of 400 mg/kg of the flower extract showed the highest reduction in serum triacylglycerides and total cholesterol levels (68.46% and 51.50%, respectively at p < 0.05). The current study proved the folk use of the flowers of S. securidaca as anti-diabetic and anti-hyperlipidemic agent which could be attributed to its high phenolic content.

Keywords: Securigera securidaca; Flowers; HPLC-DAD-MS/MS; Antidiabetic; Anti-hyperlipidemic.

1346. Molluscicidal and Mosquitocidal Activities of the Essential Oil of Mentha Suaveolens Ehrh. Cultivated in Egypt

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J. of Essential Oil Bearing Plants, 18: 436-443 (2015) IF: 0.306

The percentage yield of the essential oil obtained by hydrodistillation from the air-dried powdered aerial parts of Mentha suaveolens Ehrh. cultivated in Egypt was 1.13 %. Nineteen components were identified by GC-MS analysis of the oil which constitute to 97.95 % of its total composition. The overall chromatographic profile of the essential oil appeared to be dominated by the oxygenated constituents (74.15 %) among which carvone was the major constituent (58.36 %) while the amount of identified hydrocarbons was 23.80 % among which limonene was the major constituent (10.10 %). The molluscicidal activity of the essential oil on adult and embryonic stages of Biomphalaria alexandrina was evaluated. The essential oil gave LD$_{50}$ and LD$_{100}$ at $_{50}$ and $_{100}$ ppm/6hrs, respectively for adult snails. The essential oil also, showed 100 % ovicidal activity at 100 ppm/24hrs. The mosquitocidal activity of the essential oil on both larvae and pupae stages of Culex pipiens was also studied. The oil showed both larvicidal and pupicidal activity at the same concentrations (LD$_{50}$ and LD$_{100}$ at 50 and 100 ppm/3hrs, respectively).

Keywords: Mentha suaveolens; Essential oil; Carvone; Biomphalaria alexandrina; Culex.

1347. Effect of Certain Essential Oils on Dissolution of Three Commercial Gutta-percha Brands

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J. of Essential Oil Bearing Plants, 18: 1126-1137 (2015) IF: 0.306

The purpose of this study was to test the ability of some essential oils to dissolve three types of commercial gutta-percha brands which are commonly used in Egypt. The chemical composition of three commercially available gutta-percha brands (Hygenic, Maillefer and Meta) was determined using X-ray, FTIR and elemental microanalysis. Essential oils from thirty medicinal plants representing the six most famous families of aromatic plants growing in Egypt were extracted by steam distillation and tested for dissolving the gutta-percha brands. Essential oils from the peels of Citrus x sinensis (L.) Osbeck (Navel orange), C. deliciosa Tenora (Common mandarin) and C. x aurantium L.(Bitter orange)(Rutaceae) showed the highest dissolution rate. The essential oils from the aerial parts of Origanum syriacum L. and Lavandula hyprida Reverchon cv. Grosso (Labiateae) showed complete dissolution at 40oC, also essential oils from the seeds of Elletaria cardamomum (Cardamom) Matonvar. miniscula Burkill (Zingibraceae) showed similar dissolution at 40oC. GC-MS analysis was performed on six essential oils representing the three effective families in order to correlate their composition with their dissolution efficiency.

Keywords: Navel orange oil; Bitter orange oil; Mandarin oil; Lavandula hyprida; Cardamom; Gutta percha brands.

1348. Impact of Certain Solanum Species'S Natural Products as Potent Cytotoxic and Anti-Inflammatory Agents

Muhammad A. Alsherbiny, Shahira M. Ezzat, Fatma S. El-Sakhawy, Gehan M. Kamel and Mostafa A. Abd El-Kawy

The present study was conducted to evaluate both the cytotoxic and anti-inflammatory activities of ethanol extracts (T), and both n-butanol (B) and total glyco-alkaloid fractions (TGA) of Solanum seaforthianum Andr. (SS) and Solanum macrocarpon L. (SM) growing in Egypt. Cytotoxic activity was measured using sulforhodamine B (SRB) assay on prostate cancer cell line (PC-3), breast cancer cell line (MCF7), liver cancer cell line (HepG2) and human fibroblast cell line (HFB4) while anti-inflammatory activity was measured using formalin induced paw edema method. The highest cytotoxic potentiality was indicated for those of TGA fraction of S. seaforthianum Andr. on PC-3 cell line (IC_{50} = 0.28μg/ml ± 0.01) followed by its activity on MCF-7 cell line (IC_{50} = 2.84 μg/ml±0.20). On the other hand, the potency of TGA fractions of both species showed higher potency followed by n-butanol fractions where ethanol extracts showed lowest potency which is emphasizing the cytotoxic potentiality of the glyco-alkaloids. Based on the IC50s indicated for the different extracts and fractions on normal fibroblast cell line, considerable safety was indicated against prostate carcinoma rather than breast or hepatic carcinoma. TGA fraction of S. macrocarpon L. and of S. seaforthianum Andr. showed the highest anti-inflammatory activity with efficacy of 159 and 156%, respectively as compared to standard indomethacin. That's why the TGA fraction of S. seaforthianum Andr. was subjected for isolation of individual alkaloids using different chromatographic techniques and identified using ^{1}H and ^{13}CNMR spectroscopy beside Co-chromatography with authentic samples as solamargine (A_1), solasonine (A_2) and solasodine (A_3) which are firstly isolated from S. seaforthianum Andr. growing in Egypt.

Keywords: Solanum seaforthianum; Solanum macrocarpon; Glyco-alkaloid; Anti-inflammatory; Cytotoxicity; SRB.

1349. Comparative Botanical and Genetic Characterization of Certain Solanum Species Grown in Egypt

Muhammad A. Alsherbiny , Shahira M. Ezzat, Fatma S. El-Sakhawy, Mostafa A. Abd El-Kawy

Objective: Urgent need for proper identification and characterization has emerged for some Solanum species as their toxicity to humans and animals ranges from mildly irritating to fatal. The objective of this work was targeted towards discrimination between Solanum seaforthianum Andrews and Solanum macrocarpon L.
Methods: For establishment of different botanical and genetic criteria, this study presents a comparative investigation of the botanical features of the roots, stems and leaves of both plants through microscopical investigation of the prepared entire, transverse sections and powdered forms of different organs of both plants under study. Furthermore, the DNA of both plants was extracted from leaf samples and Random Amplified polymorphic DNA (RAPD) analysis using ten primers of arbitrary sequences.
Results: Comparative botanical characters of different organs were identified. On the other hand a total 101 fragments were generated in S. macrocarpon while 105 fragments were generated in S. seaforthianum. Where the highest degree of similarities (70%) was recorded using primer B16 therefore could be used as an indicator for obtaining genetic markers, followed by 65.38% for Z13 and the lowest degree of similarity (38.1%) was recorded using primer O14 which could be used to discriminate between the two Solanum species depending on their low values of similarity coefficients and high level of polymorphism.
Conclusion: For the present study, macro and micro-morphological characters, as well as, DNA fingerprinting can be considered as the identifying parameters to authenticate and differentiate between the two plants under study.
Keywords: Solanum; Seaforthianum; Macrocarpon; Botanical profiling; Dna Fingerprinting; RAPD.

1350. In Vivo TNF-α and IL-1β Inhibitory Activity of Phenolics Isolated from Trachelospermum Jasminoides (Lindl.) Lem

Maha Salama, Seham El-Hawary, Ola Mousa, Noha El-Askary and Ahmed Asmat

A bio-guided fractionation of the defatted ethanolic extract (DEE) of the aerial parts of Trachelospermum jasminoides and its fractions: ethyl acetate fraction (EAF), chloroform fraction (CF) and n-butanol fraction (BF) were carried out, using carragenan induced rat paw edema method, to evaluate the in vivo acute anti-inflammatory potential at a given dose of 100 mg/kg body weight compared to indomethacin (20 mg/kg body weight). The EAF revealed the highest anti-inflammatory activity (76.92%) relative to the DEE and the CF (63.82 and 48.75%, respectively) at the same tested dose, while the BF was significantly inactive. The EAF and its major isolated compounds were investigated to determine the level of pro-inflammatory cytokines using enzyme-linked immunosorbent assay (ELISA). Seven major compounds were isolated from the EAF, identified as: trachelogenin, nor-

trachelogenin and tracheloside, in addition to apigenin, luteolin, quercetin and luteolin-7-O-β-D-glucopyranoside. Identification of the isolated compounds was achieved by their physico-chemical properties and spectral analysis (1D and 2D NMR). The EAF and the isolated compounds inhibited the excessive production of tumor necrosis factor-alpha (TNF-α) and interleukin (IL)-1β. Furthermore, the liquid chromatography/electrospray ionization-tandem mass spectrometry (LC/ESI-MS) for the bioactive EAF was carried out to complete the phytochemical picture. The results of this study verified that the EAF and the major compounds exert their action through inhibition of TNF-α and IL-1 β.

Keywords: Trachelospermum jasminoides; Tumor necrosis factor-alpha (TNF-α); Interleukin (IL)-1β; Liquid chromatography/electrospray ionization-tandem mass spectrometry (LC/ESI-MS).

1351. Chemical Constituents from the Leaves of Euphorbia Ammak Growing in Saudi Arabia

Essam Abd El−Sattar, Dina Abou−Hussein and Frank Petereit

Investigation of the chloroform extract of Euphorbia ammak leaves led to the isolation of three compounds: euphol (1), a-glutinol (2) and stigmasterol (3) Their structures were elucidated by 1D and 2D NMR, as well as by comparison with the reported data. Compounds 1-3 exhibited cytotoxicity in vitro against human cervical adenocarcinoma (Hela), among which, compound 1 showed the best activity.

Keywords: Cervical adenocarcinoma; Euphol; Euphorbia ammak.

1352. Phytochemical Investigation of the Cytotoxic Latex of Euphorbia Cooperi N.E.Br

M. M. El-Sherei, W. T. Islam, R. S. El-Dine, S. A. El-Toumy and S. R. Ahmed

Background: Many investigations have been performed on the cytotoxic activity of different Euphorbia species and proved to possess moderate to strong cytotoxic effect on different human cancer cell lines.Objective: Current study aim is to determine the cytotoxic activity of the chloroform fraction derived from Euphorbia cooperi N.E.Br. latex methanolic extract on three human cancer cell lines, namely, breast cancer (MCF7), hepatocellular carcinoma (HepG2), and cervix cancer (HELA) cells in comparison to normal human melanocyte (HBF4) using Sulforhodamine B (SRB) assay. In addition,isolation and identification of the chemical constituents that might be responsible for the cytotoxic effect will be carried out

Results: The chloroform fraction showed potent cytotoxic activity aganist MCF7 cell line (IC_{50} = 4.23 + 0.08 ug/ml), moderate activity against HepG2 (IC_{50} = 10.8 + 0.74 ug/ml) and weak activity aganist HELA (IC_{50} = 26.6 + 2.1) compared to doxorubicin (IC_{50}= 3.3 + 0.1, 4.8 + 0.14, 4.2 + 0.3 ug/ml, respectively) the chloroform fraction indicated its possible selectivity aganist cancer cells rather than the normal cells (IC_{50}= 15.6 + 1.15 ug/ml on HBF4) compared to doxorubicin (IC_{50}= 4.0

+ 0.21 ug/ml on HFB4). A triterpene, euphol (1), one steroid, obtusifoliol (2) together with one diterpenoid with tigliane skeleton, 12-deoxyphorbol-13-isobutyrate-16-angelate-20-acetate (3) were isolated for the first time from the chloroform fracton of the latex of the plant under investigation. the structures of the isolated compounds were established on the basis of physical and spectroscopic analysis, including 1D and 2D NMR experiments and by comparison with the literature data. conclusion: The present study demonstrated that the chloroform fraction of the latex of E. cooperi N.E.Br showed promising cytotoxic activity especially aganist breast cancer.

Keywords: Euphorbia cooperi; Cytotoxic; Tigliane.

1353. Anticancer, Anti HIV-1 and Antimicrobial Potentials of Methanol Extract and Non Polar Fractions of Citrus Volkameriana Leaves and Phytochemical Composition

Ataa Said, Nabaweya M. El-Fiky, Khaled Rashed, Gerda Fouche, Yong-Tang Zheng, Khaled Ali Selim and Ahmed Tawila

This study investigated anticancer, anti HIV-1, antimicrobial potentials and the phytochemical composition of the total methanol extract, petroleum ether (60-80°C) and dichloromethane fractions of Citrus volkameriana leaves. Anticancer activity was measured by a sulforhodamine B (SRB) assay. Syncytia formation assay was used to evaluate anti-HIV-1 potential and antimicrobial assay was performed according to Buwa and Van staden with some modifications. The results showed that petroleum ether fraction exerted growth inhibitory effect on melanoma cancer cell line (UACC62), it inhibited the syncytia formation of HIV-1 with EC_{50} of 17.4 μg mL^{-1} and also it inhibited the growth of Micrococcus luteus B-287 and Bacillus subtilis with Minimum Inhibitory Concentrations (MIC) of 31.25 and 62.5 μg mL^{-1}, respectively. While dichloromethane fraction inhibited the growth of Micrococcus luteus with MIC of 62.5 μg mL–1. Phytochemical investigation of petroleum ether fraction yielded six compounds, (1) α-amyrin, (2) β-sitosterol, (3) 5-O-demethylnobiletin, (4) 4', 5-dihydroxy-6, 7, 8, 3'-tetramethoxy flavone, (5) Tangeretin and (6) Nobiletin while five compounds were isolated from dichloromethane fraction including, (7) 4', 5-dihydroxy-3', 6, 7-trimethoxyflavone (cirsilineol), (8) luteolin 7-O-methyl ether, (9) Hesperitin, (10) 4'-hydroxy-5, 6, 7-trimethoxy flavone and (11) β-sitosterol 3-O-β-D-glucoside. The compounds 7, 8 and 10 were isolated for the first time from Rutacea family. This study provides promising results for C. volkameriana leaves in treatment of tumors, microbes and HIV/AIDS-related opportunistic infections.

Keywords: Citrus volkameriana; Bioactivities; Sterols; Methylated flavones.

1354. Hepatoprotective and Antioxidant Polyphenols From A Standardized Methanolic Extract of the Leaves of Liquidambar Styraciflua L.

Hanaa H. Eid, Rola M. Labib, Nagy S. Abdel Hamid, Manal A. Hamed and Samir A. Ross

The methanolic extract of the leaves of Liquidambar styraciflua L. (Altingiaceae) (LSE) was evaluated for hepatoprotective and antioxidant activities in carbon tetrachloride liver-damaged rats. Hepatotoxicity was induced via intraperitoneal injection of CCl_4 1:9 in olive oil, at a dose of 0.5 ml/kg b.wt. The animals received the extract, orally, at two dose levels (250 and 500 mg/kg b.wt.) The administration regimen was twice a week, for six consecutive weeks. LSE exhibited a significant dose-dependent protective effect by lowering the serum levels of alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), malondialdehyde (MDA) and ameliorating the level of serum protein. In addition, LSE showed antioxidant activity through improving the levels of blood glutathione (GSH), vitamin C, vitamin E and hepatic total protein contents. The LSE revealed activity approached that of silymarin, a known hepatoprotective agent. These biochemical observations were supported by examination of the histopathological features of the liver. Chromatographic fractionation of LSE afforded seven phenolic compounds. These were identified on the basis of chromatographic, chemical and spectroscopic analyses as: gallic acid (1), isorugosin B (2), casuarictin (3), quercetin-3-O-β-D-^{4}C1-glucopyranoside (4), myricetin-3-O-α-L-^{1}C4- rhamnopyranoside (myricetrin) (5), quercetin (6) and myricetin (7). The isolated phenolics probably account for the antioxidant and hepatoprotective effects exhibited by the parent extract. Furthermore, a validated RP-HPLC method was devised for standardization of LSE, in view to fulfill the requirements of efficient research methodology for evaluation of bioactive herbal drugs.

Keywords: Liquidambar stryaciflua l.; Hepatoprotective; Antioxidant; Polyphenols; Standardized extract.

Dept. of Pharmacology and Toxicology

1355. Saxagliptin: A Novel Antiparkinsonian Approach

Noha N. Nassar, Muhammad Y. Al-Shorbagy, Hany H. Arab and Dalaal M. Abdallah

The emergence of glucagon-like peptide-1 as a crucial contender in modifying neurodegenerative diseases in the preclinical studies has instigated interest in investigating the antiparkinsonian effect of dipeptidyl peptidase (DPP)-4 inhibition. Notably, saxagliptin (SAX), the DPP-4 inhibitor, recently showed efficacy in ameliorating streptozotocin-induced Alzheimer's disease; however, its effect on Parkinson's disease (PD) has not yet been elucidated. In a rat rotenone (ROT) model, SAX prominently improved motor performance as well as muscle coordination and corrected akinesia. Moreover, SAX preserved substantia nigra pars compacta tyrosine hydroxylase (TH) immunoreactivity while halting the reduction in the striatal TH, dopamine (DA) and complex I. Meanwhile, SAX prevented the ROT-induced increment of striatal DPP-4 and the decline in cAMP, ATP/ADP and brain-derived neurotropic factor levels. Improvement in striatal energy level was associated with partial hindrance of ROT-induced body weight reduction. In addition, through its anti-inflammatory potential, SAX decreased the ROT-induced nuclear factor-α, inducible nitric oxide synthase, tumor necrosis factor-a, intracellular adhesion molecule-1 and myeloperoxidase. The antiapoptotic marker B-cell lymphoma-2 was enhanced by SAX, versus reduction in caspase-3 and its intrinsic apoptotic activator

cytochrome C. Furthermore, SAX amended alterations induced by ROT in the thiobarbituric acid reactive substances and the transcriptional factor Nrf-2 level. In conclusion, SAX can be introduced as a novel approach for the management of PD based on the remarkable improvement in motor functions denoting antiparkinsonian efficacy via antioxidant, anti-inflammatory, antiapoptotic, neuroprotective and neurorestorative mechanisms. These effects were linked to DPP-4 inhibition, reduced neurodegeneration and enhanced DA.

Keywords: Saxagliptin; Parkinson's disease; Tumor necrosis factor-A; Cytochrome C.

1356. Nicorandil Enhances the Efficacy of Mesenchymal Stem Cell Therapy in Isoproterenol-Induced Heart Failure in Rats

Sarah S. Mohamed, Lamiaa A. Ahmed, Wael A. Attia and Mahmoud M. Khattab

Stem cell transplantation has emerged as a promising technique for regenerative medicine in cardiovascular therapeutics. However, the results have been less than optimal. The aim of the present study was to investigate whether nicorandil could offer an additional benefit over bone marrow-derived mesenchymal stem cell therapy in isoproterenol-induced myocardial damage and its progression to heart failure in rats. Isoproterenol was injected subcutaneously for 2 consecutive days at doses of 85 and 170mg/kg/day, respectively. Nicorandil (3mg/kg/day) was then given orally with or without a single intravenous bone marrow-derived mesenchymal stem cell administration. Electrocardiography and echocardiography were recorded 2 weeks after the beginning of treatment. Rats were then sacrificed and the ventricle was isolated for estimation of tumor necrosis factor-alpha, vascular endothelial growth factor and transforming growth factor-beta. Moreover, protein expressions of caspase-3, connexin-43 as well as endothelial and inducible nitric oxide synthases were evaluated. Finally, histological studies of myocardial fibrosis and blood vessel density were performed and cryosections were done for estimation cell homing. Combined nicorandil/bone marrow-derived mesenchymal stem cell therapy provided an additional improvement compared to cell therapy alone toward reducing isoproterenol-induced cardiac hypertrophy, fibrosis and inflammation. Notably, combined therapy induced significant increase in angiogenesis and cell homing and prevented isoproterenol-induced changes in contractility and apoptotic markers. In conclusion, combined nicorandil/bone marrow-derived mesenchymal stem cell therapy was superior to cell therapy alone toward preventing isoproterenol-induced heart failure in rats through creation of a supportive environment for mesenchymal stem cells.

Keywords: Heart failure; Isoproterenol; Mesenchymal stem cells; Nicorandil.

1357. Neuroprotective Effects of Vildagliptin in Rat Rotenone Parkinson's Disease Model: Role of RAGE-Nf$_k$B and Nrf2-Antioxidant Signaling Pathways

Rania M. Abd El-Salam and Marwa M.Safar

Medicine Sector

Gliptins have been recently shown to conquer neuronal degeneration in cell cultures via modulating glucagon-like peptide (GLP)-1. This peptide produced in the gut not only crosses the blood–brain barrier but is also synthesized in the brain and acts on GLP-1R exerting central anti-inflammatory and antiapoptotic effects, thus impeding neuronal damage. This study investigated the antiparkinsonian effect of vildagliptin, a dipeptidyl peptidase (DPP)-4 inhibitor in a rat rotenone model targeting mainly the RAGE-NFjB/Nrf2-signaling pathways, to judge the potential anti-inflammatory/antioxidant effects of the drug. Vildagliptin markedly improved the motor performance in the open field and rotarod tests, effects that were emphasized by the accompanied reduction in striatal dopamine content. It modified the striatal energy level (ADP/ ATP) associated with partial antagonism of body weight reduction. This incretin enhancer suppressed nuclear factor (NF)jB and, consequently, the downstream inflammatory mediator tumor necrosis factor-a. Normalization of receptor for advanced glycated end product (RAGE) is a main finding which justifies the anti-inflammatory effects of vildagliptin, together with hampering striatal inducible nitric oxide synthase, intracellular adhesion molecule-1 as well as myeloperoxidase. The antioxidant potential of vildagliptin was depicted as entailing reduction in thiobarbituric acid-reactive substances and the transcriptional factor Nrf-2 level. Vildagliptin guarded against neuronal demise through an antiapoptotic effect as reflected by the reduction in the mitochondrial matrix component cytochrome c and the key downstream executioner caspase-3. In conclusion, vildagliptin is endowed with various neuroprotective effects and thus can be a promising candidate for the management of Parkinson's disease.

Keywords: Apoptosis; Dipeptidylpeptidase-4; Neuroinflammation; RAGE; Rotenone; Vildagliptin.

1358. Rice Bran Extract Compensates Mitochondrial Dysfunction in A Cellular Model of Early Alzheimer's Disease

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Mitochondrial dysfunction plays an important role in brain aging and has emerged to be an early event in Alzheimer's disease (AD), contributing to neurodegeneration and the loss of physical abilities seen in patients suffering from this disease. We examined mitochondrial dysfunction in a cell culture model of AD (PC12$_{APPsw}$ cells) releasing very low amyloid-β (Aβ$_{40}$) levels and thus mimicking early AD stages. Our data show that these cells have impaired energy metabolism, low ATP levels, and decreased endogenous mitochondrial respiration. Furthermore, protein levels of PGC1a as well as of Mitofusin 1 were decreased. PC12$_{APPsw}$ cells also showed increased mitochondrial content, probably due to an attempt to compensate the impaired mitochondrial function. Recent data showed that stabilized rice bran extract (RBE) protects from mitochondrial dysfunction in vivo Pharmacol Res. (2013) 76C, 17-27. To assess the effect of RBE on mitochondrial function, we treated PC12$_{APPsw}$ cells for 24 h with RBE. Key components of RBE are oryzanols, tocopherols, and tocotrienols, all substances that have been found to exert beneficial effects on mitochondrial function. RBE incubation elevated ATP production and respiratory rates as well as PGC1α protein levels in PC12$_{APPsw}$ cells, thus improving the impaired

mitochondrial function assessed in our cell culture AD model. Therefore, RBE represents to be a promising nutraceutical for the prevention of AD.

Keywords: Alzheimer's disease; PC12 cells; Bioenergetics; Mitochondria; Mitochondrial dynamics; Nitrosative stress; Nutrition; Respiration; Rice bran extract.

1359. Bacteria-Derived Compatible Solutes Ectoine and 5α-Hydroxyectoine Act as Intestinal Barrier Stabilizers to Ameliorate Experimental Inflammatory Bowel Disease

Heba Abd El-Aziz, Walaa Wadie, Olaf Scherner, Thomas Efferth, and Mohamed T. Khayyal

Earlier studies showed that the compatible solute ectoine (1) given prophylactically before induction of colitis by 2,4,6-trinitrobenzenesulfonic acid (TNBS) in rats prevented histological changes induced in the colon and the associated rise in inflammatory mediators. This study was therefore conducted to investigate whether ectoine (1) and its 5a-hydroxy derivative (2) would also be effective in treating an already established condition. Two days after inducing colitis in rats by instilling TNBS/alcohol in the colon, animals were treated orally once daily for 1 week with either 1 or 2 (50, 100, 300 mg/kg). Twenty-four hours after the last drug administration rats were sacrificed. Ulcerative lesions and colon mass indices were reduced by 1 and 2 in a bell-shaped manner. Best results were obtained with 100 mg/kg ectoine (1) and 50 mg/kg 5α-hydroxyectoine (2). The solutes normalized the rise in myeloperoxidase, TNFα, and IL-1β induced by TNBS but did not affect levels of reduced glutathione or ICAM-1, while reducing the level of fecal calprotectin, an established marker for inflammatory bowel disease. The findings indicate that the naturally occurring compatible solutes ectoine (1) and 5a-hydroxyectoine (2) possess an optimum concentration that affords maximal intestinal barrier stabilization and could therefore prove useful for better management of human inflammatory bowel disease.

Keywords: Ectoine, 5α-hydroxyectoine, Colitis, TNBS.

1360. Geraniol, Alone and in Combination With Pioglitazone, Ameliorates Fructose-induced Metabolic Syndrome in Rats Via the Modulation of Both Inflammatory and Oxidative Stress Status

Sherehan M. Ibrahim, Ezz El-Din S. El-Denshary and Dalaal M. Abdallah

Geraniol (GO) potent antitumor and chemopreventive effects are attributed to its antioxidant and anti-inflammatory properties. In the current study, the potential efficacy of GO (250 mg/kg) in ameliorating metabolic syndrome (MetS) induced by fructose in drinking water was elucidated. Moreover, the effect of pioglitazone (5 and 10 mg/kg; PIO) and the possible interaction of the co-treatment of GO with PIO5 were studied in the MetS model. After 4 weeks of treatment, GO and/or PIO reduced the fasting blood glucose and the glycemic excursion in the intraperitoneal glucose tolerance test. GO and PIO5/10 restrained

visceral adiposity and partly the body weight gain. The decreased level of peroxisome proliferator activated receptor (PPAR)-γ transcriptional activity in the visceral adipose tissue of MetS rats was increased by single treatment regimens. Though GO did not affect MetS-induced hyperinsulinemia, PIO5/10 lowered it. Additionally, GO and PIO5/10 suppressed glycated hemoglobin and the receptor for advanced glycated end products (RAGE). These single regimens also ameliorated hyperuricemia, the disrupted lipid profile, and the elevated systolic blood pressure evoked by MetS. The rise in serum transaminases, interleukin-1β, and tumor necrosis factor-a, as well as hepatic lipid peroxides and nitric oxide (NO) was lowered by the single treatments to different extents. Moreover, hepatic non-protein thiols, as well as serum NO and adiponectin were enhanced by single regimens. Similar effects were reached by the combination of GO with PIO5; however, a potentiative interaction was noted on fasting serum insulin level, while synergistic effects were reflected as improved insulin sensitivity, as well as reduced RAGE and triglycerides. Therefore, GO via the transcriptional activation of PPAR-γ reduces inflammation and free radical injury produced by MetS. Thereby, these effects provide novel mechanistic insights on GO management of MetS associated critical risk factors. Moreover, the co-administration of GO to PIO5 exalted the antidiabetic drug anti-MetS efficacy.

Keywords: Geraniol; Hyperuricemia; Hyperinsulinemia; PPAR-γ; Inflammation.

1361. Antidiabetic Effect of Galantamine: Novel Effect for A Known Centrally Acting Drug

Mennatallah A. Ali, Hanan S. El-Abhar, Maher A. Kamel and Ahmed S. Attia

Plos One, e0134648: 1-28 (2015) IF: 3.234

The cholinergic anti-inflammatory pathway is one of the putative biochemical pathways that link diabetes with Alzheimer disease. Hence, we aimed to verify the potential antidiabetic effect of galantamine, unveil the possible mechanisms and evaluate its interaction with vildagliptin. The n5-STZ rat model was adopted and the diabetic animals were treated with galantamine and/or vildagliptin for 4 weeks. Galantamine lowered the n5-STZ-induced elevation in body weight, food/water intake, serum levels of glucose, fructosamine, and ALT/AST, as well as AChE in the tested organs. Moreover, it modulated successfully the lipid profile assessed in serum, liver, and muscle, and increased serum insulin level, as well as % β-cell function, in a pattern similar to that of vildagliptin. Additionally, galantamine confirmed its antioxidant (Nrf2, TAC, MDA), anti-inflammatory (NF-κB, TNF-α, visfatin, adiponectin) and anti-apoptotic (caspase-3, cytochrome c) capabilities by altering the n5-STZ effect on all the aforementioned parameters. On the molecular level, galantamine/vildagliptin have improved the insulin (p-insulin receptor, p-Akt, GLUT4/GLUT2) and Wnt/β-catenin (p-GSK-3β, β-catenin) signaling pathways. On almost all parameters, the galantamine effects surpassed that of vildagliptin, while the combination regimen showed the best effects. The present results clearly proved that galantamine modulated glucose/lipid profile possibly through its anti-oxidant, -apoptotic, -inflammatory and -cholinesterase properties. These effects could be attributed partly to the enhancement of insulin and Wnt/β-catenin signaling pathways. Galantamine can be strongly considered as a potential antidiabetic agent and as an add-on therapy with other oral antidiabetics.

Keywords: Galantamine; Inflammatory; Antidiabetic.

1362. Mangiferin Mitigates Gastric Ulcer in Ischemia/reperfused Rats: Involvement of PPAR-γ, NF-κB and Nrf2/HO-1 Signaling Pathways

Magdy Mahmoud Awny, Ahmed S. Attia, Mohamed F. Abd-Ellah and Hanan Salah El-Abhar

Plos One, e0134648: 1-14 (2015) IF: 3.234

Mangiferin (MF), a xanthonoid from Mangifera indica, has been proved to have antisecretory and antioxidant gastroprotective effects against different gastric ulcer models; however, its molecular mechanism has not been previously elucidated. Therefore, the aim of this study was to test its modulatory effect on several signaling pathways using the ischemia/reperfusion model for the first time. Animals were treated with MF, omeprazole (OMP), and the vehicle. The mechanistic studies revealed that MF mediated its gastroprotective effect partly via inducing the expression of Nrf2, HO-1 and PPAR-γ along with downregulating that of NF-κB. Surprisingly, the effect of MF, especially the high dose, exceeded that mediated by OMP except for Nrf2. The molecular results were reflected on the biomarkers measured, where the antioxidant effect of MF was manifested by increasing total antioxidant capacity and glutathione, besides normalizing malondialdehyde level. Additionally, MF decreased the I/R-induced nitric oxide elevation, an effect that was better than that of OMP. In the serum, MF, dose dependently, enhanced endothelial nitric oxide synthase, while reduced the inducible isoform. Regarding the anti-inflammatory effect of MF, it reduced serum level of IL-1β and sE-selectin, effects that were mirrored on the tissue level of myeloperoxidase, the neutrophil infiltration marker. In addition, MF possessed an antiapoptotic character evidenced by elevating Bcl-2 level and reducing that of caspase-3 in a dose related order. As a conclusion, the intimated gastroprotective mechanisms of MF are mediated, partially, by modulation of oxidative stress, inflammation and apoptosis possibly via the Nrf2/HO-1, PPAR-γ/NF-κB signaling pathways.

Keywords: Mangifera; Gastroprotective; Omeprazole; Ischemia/reperfusion.

1363. Novel Sequential Stress Model for Functional Dyspepsia: Efficacy of the Herbal Preparation STW5

Heba Abd El-Aziz, Walaa Wadie, Hala F. Zaki, Jürgen Müller, Ola f. Kelber, Thomas Efferth and Mohamed T. Khayyal

Phytomedicine, 22: 588-595 (2015) IF: 3.126

Background: Many screening procedures for agents with potential usefulness in functional dyspepsia (FD) rely on animals exposed to stress early in life (neonatal maternal separation, NMS) or in adulthood (restraint stress, RS).

Purpose: Since many clinical cases of FD have been associated with stress in early life followed by stress in adulthood, a sequential model simulating the clinical situation is described. To explore the validity of the model, the efficacy of STW5, a multicomponent herbal preparation of proven usefulness in FD, was tested.

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Study design methods: A sequential stress model established where rats are exposed to NMS after birth followed later by RS in adulthood. Stress hormones and ghrelin were measured in plasma, while responsiveness of stomach fundus strips to smooth muscle stimulants and relaxants was assessed ex-vivo. The effectiveness of treatment with STW5 a few days before and during exposure to RS in preventing changes induced by the stress model is reported and compared to its efficacy when used in animals subjected to RS alone.

Results: Responses to both stimulants and relaxants were reduced to various extents in the studied models, but treatment with STW5 tended to normalize gastric responsiveness. Plasma levels of ghrelin, corticosterone releasing factor, and corticosterone were raised by RS as well as the sequential model. Treatment with STW5 tended to prevent the deranged parameters.

Conclusion: The sequential stress model has a place in drug screening for potential usefulness in FD as it simulates more the clinical setting. Furthermore, the findings shed more light on the mechanisms of action of STW5 in FD.

Keywords: Functional dyspepsia; Gastric accommodation; STW5; Neonatal maternal separation; Restraint stress; Ghrelin.

1364. Clinical Significance of Serum Interleukin-23 and A/G Gene (rs17375018) Polymorphism in Behçets Disease: Relation to Neuro-Behçet, Uveitis and Disease Activity

Tamer Gheita, Sherif M.Gamal, Ihab Shaker, Hussien S.El Fishawy, Rehab El Sisi and Sanaa A. Kenawy

Objective: The aim of this work was to measure the level of serum IL-23 and assess its receptor genotypes in Behçets disease (BD) patients and to study the clinical significance and relation to disease activity.

Methods: Fifty BD patients and 30 age and sex matched controls were included. Disease activity was assessed using BD Current Activity Form (BDCAF). Serum IL-23 was quantified by ELISA and (rs17375018) genotyping performed by real time PCR-allelic discrimination technique.

Results: The serum IL-23 level was significantly higher in patients compared to the control (p<0.0001). The IL23 genotypes were comparable between patients and control. Genotype in neuro-Behçets patients was AA (5.3%), AG (36.8%) and GG in 57.9% and those without: AA(22.6%), AG (35.5%) and GG (41.9%). Those with uveitis had AA (8.3%), AG (33.3%), GG (58.3%) while those without had AA (23.1%), AG (38.5%) and GG (38.5%). The IL-23 level according to the three genotypes was insignificantly different (p=0.18). The BDCAF was significantly lower in those with AA genotype (1.88±1.13) compared to AG (2.06±1.39) and GG (3.17±1.49) (p=0.02). IL23 level significantly correlated with the BDCAF (r=0.62, p<0.0001) and disease duration (r=0.42,p=0.002).

Conclusion: This is the first study to report the possible role played by IL-23 and its gene polymorphism in neuro-BD and not only uveitis with a significant relation to disease activity, making both potential markers. Larger scale multicentre longitudinal studies are required to confirm its role in the pathogenesis of neuro-Behçet's and its impact on response to therapy.

Keywords: Interleukin-23; A/G gene (rs17375018) Polymorphism; Behçets disease; Neuro-Behçet'S; Uveitis; Disease activity.

1365. Geraniol Ameliorates TNBS-induced Colitis: Involvement of Wnt/β-catenin, p38MAPK, NFκB, and PPARγ Signaling Pathways

Ayman A. Soubh, Dalaal M. Abdallah and Hanan S. El-Abhar

Aims: Geraniol, a natural component of plant essential oils, exhibits potent chemopreventive effects in the colon; however, its possible role/mechanisms in experimental colitis have not been elucidated, which is the aim of this study.

Main Methods: To fulfill this goal, rats were treated for 11days with geraniol and/or sulfasalazine using a TNBS-induced colitis model.

Key Findings: Geraniol significantly hindered the colitis-clinical signs (weight loss, colon edema,ulcerative area, colon/spleen mass indices) and opposed the altered oxidative/nitrosative stress. It restored the depleted total antioxidant capacity and lessened the elevated levels of nitric oxide and lipid peroxide. TNBS induced apoptosis and inflammatory cell infiltration, whereas geraniol curtailed these effects by diminishing the levels of caspase-3, intercellular adhesion molecule-1, and myeloperoxidase. The anti-inflammatory effect was documented by inhibiting the colon contents of prostaglandin E2 and interleukin-1β. In order to delve into the anti-colitic signaling pathways, geraniol inhibited the content/expression of glycogen synthase kinase (GSK)-3β, β-catenin, p38 mitogen activated protein kinase (p38MAPK), and nuclear factor kappa B (NFκB), but upregulated that of peroxisome proliferator activated receptor γ (PPARγ). These effects were comparable to those of sulfasalazine, the standard drug, whereas its combination with geraniol mediated effects that surpassed either treatment alone.

Significance: Geraniol in the current study improved experimental colitis partly via its antioxidant, anti-inflammatory, and immunosuppressive potentials, possibly by modulating the Wnt/GSK-3β/β-catenin, p38MAPK, NFκB, and PPARγ signaling pathways. The study also revealed that geraniol represents a valuable asset against colitis alone or in combination with the conventional anti-colitic therapies.

Keywords: Geraniol; P38MAPK; NFκB; PPARγ; TNBS; Wnt/β-Catenin pathway.

1366. Sitagliptin Attenuates Transient Cerebral Ischemia/reperfusion Injury in Diabetic Rats: Implication of the Oxidative–inflammatory–Apoptotic Pathway

Ayman E. El-Sahar, Marwa M. Safar, Hala F. Zaki, Amina S. Attia and Afaf A. Ain-Shoka

Aims: Ischemic stroke is a major macrovascular complication of diabetes mellitus. Sitagliptin, a dipeptidyl peptidase-IV inhibitor, was recently shown to improve cognitive functions in diabetic rats; hence the present study was conducted to evaluate its protective effect against transient ischemia–reperfusion (I/R) in diabetic animals.

Main Methods: Diabetes was induced by streptozotocin (40 mg/kg). Six weeks later, cerebral I/R was induced by bicommon carotid occlusion for 15 min followed by 1 h reperfusion. Sitagliptin (250 mg/kg; p.o.) was administered daily during the last 2 weeks before I/R**.**

Key Findings: The drug alleviated hippocampal injury inflicted by diabetes and/or I/R injury where it suppressed nuclear factor kappa (NF-κ)B, and consequently the downstreaminflammatory cytokines tumor necrosis factor- α and interleukin-6. In parallel, the anti-inflammatory cytokine interleukin-10was elevated. Antioxidant potential of sitagliptin was depicted, where it reduced neutrophil infiltration, lipid peroxides and nitric oxide associated with replenished reduced glutathione. Decline of excitatory amino acid glutamate content is a main finding which is probably mediated by the NF- κ B signaling pathway as well as improved oxidant status. Sitagliptin exerted an anti-apoptotic effect as reflected by the reduction of the mitochondrial matrix component cytochrome -C and the key downstreamexecutioner caspase-3. Histopathological examination corroborated the biochemical data. **Significance**: These findings suggest that sitagliptin is endowed with neuroprotective properties which are probably mediated by its antioxidant, anti-inflammatory, and anti-apoptotic mechanisms and hence may provide a novel agent for the management of ischemic stroke in diabetics.
Keywords: Apoptosis; Cytokines; Hippocampus; Ischemia/ reperfusion; Sitagliptin; Streptozotocin.

1367. Montelukast, A Cysteinyl Leukotriene Receptor-1 Antagonist Protects Against Hippocampal Injury Induced by Transient Global Cerebral Ischemia and Reperfusion in Rats

M. A. Saad, R. M. Abd El-Salam, S. A. Kenawy and A. S. Attia

Cysteinyl leukotrienes (CysLTs) are potent pro-inflammatory and immune modulating lipid mediators involved in inflammatory diseases and were boosted in human brain after acute phase of cerebral ischemia. The antagonism of CysLTs receptors may offer protection against ischemic damage. Therefore it seemed interesting to study the possible neuroprotective effect of Montelukast, a CysLTR1 antagonist in global cerebral ischemia/reperfusion (IR) injury in rats. Global cerebral ischemia-reperfusion was induced by bilateral carotid artery occlusion for 15 min followed by 60 min reperfusion period. Animals were randomly allocated into three groups (n = 30 per group): Sham operated, I/R control and rats treated with montelukast (0.5 mg/kg, po) daily for 7 days then I/R was induced 1 h after the last dose of montelukast. After reperfusion rats were killed by decapitation, brains were removed and both hippocampi separated and the following biochemical parameters were estimated; lactate dehydrogenase activity, oxidative stress markers (lipid peroxides, nitric oxide and reduced glutathione), inflammatory markers (myeloperoxidase, tumor necrosis factor-alpha, nuclear factor kappa-B, interleukin-6 and interleukin-10), apoptotic biomarkers (caspase 3 and cytochrome C), neurotransmitters (glutamate, gamma aminobutyric acid), Cys-LTs contents and CysLT1 receptor expression; as well as total brain infarct size and histopathological examination of the hippocampus were assessed. Montelukast protected hippocampal tissue by reducing oxidative stress, inflammatory and apoptotic markers. Furthermore, it reduced glutamate and lactate dehydrogenase activity as well as infarct size elevated by I/R. These results were consistent with the histopathological findings. Montelukast showed a neuroprotective effects through antioxidant, anti-inflammatory and antiapoptotic mechanisms.

Keywords: Montelukast; Ischemia/reperfusion; Oxidative stress Apoptosis; Inflammation.

1368. Ischemic Preconditioning and Postconditioning Alleviates Hippocampal Tissue Damage Through Abrogation of Apoptosis Modulated by Oxidative Stress and Inflammation During Transient Global Cerebral Ischemia-Reperfusion in Rats

M. A. Saad, R. M. Abd El-Salam, S. A. Kenawy and A. S. Attia

Introduction: It has been argued recently that ischemic preconditioning (IPre) and postconditioning (IPost) have beneficial effects in many ischemic disorders however; their effects on global ischemia/reperfusion (I/R) are poorly understood. Thus, the present work aimed to study the possible mechanisms underlying the neuroprotective effects of IPre and IPost. METHODS: Animals were randomly allocated into 4 groups (n = 30): (1) Sham operated (SO); (2) I/R group, animals were subjected to 15 min global ischemia followed by 60 min reperfusion; (3) IPre, animals were subjected to 3 episodes of 5 min ischemia followed by 10 min reperfusion before I/R; (4) IPost, animals were subjected to three episodes of 10s of ischemia and 10s of reperfusion after the period of ischemia followed by a 60 min reperfusion period. Lactate dehydrogenase activity, oxidative stress, inflammatory and apoptotic biomarkers, as well as neurotransmitters, infarct size and histopathological examination were assessed.
Results: I/R induced hippocampal damage through increasing oxidative stress, inflammatory, excitotoxic and apoptotic markers as well as lactate dehydrogenase activity and infarct size. Both, IPre and IPost attenuated most markers induced by I/R. **Conclusions**: IPre and IPost neuroprotective effects can be explained through their anti-oxidant, anti-inflammatory and anti-apoptotic mechanisms
Keywords: Preconditioning; Postconditioning; Ischemia/ reperfusion; Oxidative stress; Apoptosis; Inflammation.

1369. Effect of Galantamine on Adjuvant-induced Arthritis in Rats

Mennatallah A. Gowayed, Rowaida Refaat, Walid M. Ahmed and Hanan S. El-Abhar

Stimulation of the vagus nerve suppresses cytokine production and macrophage activation, via the interaction of its neurotransmitter acetylcholine (ACh) with the a7 subunit of the nicotinic acetylcholine receptor (α7nAChR), present on neurons and inflammatory cells. The present study aimed to verify the potential anti-inflammatory effect of galantamine against experimental arthritis induced in rats. Fourteen days post adjuvant injection, Sprague-Dawley rats were treated orally with three doses of galantamine (1.25, 2.5 and 5 mg/kg) or leflunomide (10 mg/kg) for 2 weeks and arthritis progression was assessed by hind paw swelling. Additionally, serum biomarkers, viz., anti-cyclic citrullinated peptide antibodies (Anti-CCP), tumor necrosis factor-α (TNF-α), interleukin-10 (IL-10) and monocyte chemoattractant protein-1 (MCP-1) were measured. Radiological

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examination of the hind paws was also carried out to evaluate the degree of joint damage. Adjuvant arthritis led to a significant weight loss, marked swelling of the hind paw and alteration in the serum levels of anti-CCP, TNF-α, IL-10 and MCP-1. These alterations were associated with significant radiological changes of the joints. Galantamine, in a dose-dependent manner, reduced significantly all biomarkers of inflammation, with the highest dose showing the best beneficial anti-inflammatory effect that was superior in magnitude to the reference drug leflunomide in most of the studied parameters. In conclusion, these results suggest that galantamine may represent a novel, inexpensive and effective therapeutic strategy in the treatment of rheumatoid arthritis.

Keywords: Adjuvant-induced arthritis; Anti-CCP; Galantamine; Galantamine (pubchem Cid: 9651); Il-10; Leflunamide (pubchem Cid: 3899); MCP-1; Saline (pubchem Cid: 5234); TNF-α.

1370. Modulation of the Pharmacological Properties of Meloxicam by Octreotide in Rats

Sally Abdul Wanees El-Awdan, Nermeen Al-Shafeey, Omar A. Salam, Wafaa Ibrahim El-Iraqy and Sanaa Abdul Bakky Kenawy

The purpose of this study was to investigate the anti-inflammatory, analgesic, antipyretic and antiulcer properties of somatostatin analogue octreotide (10 and 100 µg/kg) and its influence on the effect of NSAID meloxicam (1 and 2 mg/kg) in rats. Carrageenan-induced rat paw oedema was used as an acute anti-inflammatory model as well as adjuvant-induced arthritis as a chronic model.

Hot plate test on rats and acetic acid (0.6%) writhing test were used as acute analgesic models while the plantar test using an infrared beam directed to the paw of arthritic rats was used as a chronic analgesic model. Antipyretic effect was evaluated using Brewer's yeast (44%) induced hyperthermia in rats while pylorus ligation was used as a model to evaluate the ulcerogenic effects. Meloxicam, octreotide and their combinations administered subcutaneously showed anti-inflammatory effects in both acute and chronic models.

Only the high doses of meloxicam and octreotide showed significant analgesic effect in the hot plate test, while all doses showed significant analgesic effects in the acetic acid-induced writhing test and in the plantar test. In yeast-induced hyperthermia, only meloxicam has an antipyretic effect. Meloxicam resulted in profound gastric lesions and exerted deleterious effects on the gastric mucosa in pyloric-ligated rats. Octreotide did not cause any harmful effect on the gastric mucosa, besides; octreotide attenuated the harmful ulcerogenic effects of meloxicam when administered in combination with it. Both meloxicam and octreotide and their combination significantly decreased the malondialdehyde (MDA) content in the arthritic rats indicating their antioxidant effects.

Keywords: Octreotide; Inflammation; Hyperthermia; Pylorus ligation; Meloxicam.

1371. Prophylactic and Curative Anti-Ulcerative Colitis Activity and the Possible Mechanisms of Action of Some Desert Plants

Reham M. El-Meligy, Amani S. Awaad, Gamal A. Soliman, Abir B. Bacha, Ahmed M. Alafeefy and Sanaa A. Kenawy

The aim of the present study was to evaluate both prophylactic and curative anti-ulcerative colitis activity and the possible mechanism of action of seven desert plant extracts. Seven desert plants from different families; Conyza dioscoridis (L.) Desf. (Asteraceae), Euphorbia hirta L. (Euphorpiaceae), Origanum syriacum L. and Salvia lanigera L. (Lamiaceae), Sisymbrium irio L., Solanum nigrum Linn. (Solanaceae) and Solenostemma arghel (Del.) Hayne. (Asclepiadaceae) were separately evaluated at three doses (125, 250, and 500 and mg/kg) using the acetic acid-induced colitis model. The investigated extracts possessed prophylactic and curative anti-ulcerative colitis activities in a dose-dependent manner, where Salvia lanigera (87.9) and Solenostemma arghel (89.2) were the most effective extracts whereas the dexamesathone produced 68%. These extracts were further investigated for estimation of their mechanism of action. The in vitro potential radical (DPPH) scavenging activities of the investigated extracts were well supported with the reduction of colonic MDA content for both extracts. Suppression of the inflammatory mediator TNF-α and inhibition of both PLA2 and protease enzymes may play an important role in the anti-ulcerative colitis activities. The investigated extracts were safe for use up to 5g/kg and the total alcohol extracts of Salvia lanigera and Solenostemma arghel (400mg/kg for 35d) showed no alteration on liver and kidney functions. Phytochemical screening of the investigated extracts revealed the presence of flavonoids, tannins, unsaturated sterols, and proteins which could be responsible for the activities.

Keywords: DPPH; MDA; Salvia lanigera; Solenostemma arghel; TNF-α.

1372. Camel Milk: Potential Utility as An Adjunctive Therapy to Peg-IFN/RBV in HCV-4 Infected Patients in Egypt.

Walid A. Mohamed, Mona F. Schaalan and Hanan S. El-Abhar

The present prospective study aims to investigate the potential therapeutic effect and the underlying mechanisms of drinking camel milk for 60 days as an adjunctive therapy to the standard treatment PEG/RBV. Twenty-five hepatitis C virus (HCV)-infected Egyptian patients, with mild to moderate parenchymal affection to mild cirrhosis were enrolled in this study after proper history taking and clinical examination. Their biomarkers were evaluated before and after the addition of camel milk. The improving effect of camel milk was reflected on the marked inhibition of the serum levels of the proinflammatory markers, viz., tumor necrosis factor-α, monocyte chemotactic protein-1, hyaluronic acid, and TGF-β1, besides PCR, AST, ALT, GGT, bilirubin, prothrombin time, INR, and alpha-fetoprotein. In addition, camel milk elevated significantly ($P < 0.001$) the serum levels of albumin, the antiapoptotic protein BCL-2, the total antioxidant capacity, interleukin-10, and vitamin D. In

conclusion, our study revealed a regulatory function of camel milk on multiple parameters of inflammatory mediators, immunomodulators, antiapoptosis, and antioxidants, giving insight into the potential therapeutic benefit underlying the anti-HCV actions of camel milk. The limitations of the current study include the small sample size recruited and the failure to test it on cohorts with severe stages of hepatitis; like Child-Pugh stage C, and hepatocellular carcinoma.

Keywords: Camel milk; HCV-4; Patients; Egypt.

1373. Mechanisms Involved in the Anti-inflammatory and Vascular Effects of Iberis Amara Extract

Mohamed T. Khyyal, Azza M. Agha, Hala F. Zaki, Ayman El-Sahar and Heba Abd El-Aziz

Planta Medica, 81: 1097-1102 (2015) IF: 2.152

The anti-inflammatory potential and vasoprotective effects of an Iberis amara extract in a rat model of arthritis were investigated. I. amara, or bitter candytuft, has long been known for its anti-inflammatory properties on account of its active constituents, including cucurbitacins, kaempferol, and sinapic acid. The present study was intended to explore more in depth its anti-inflammatory activity in both acute (carrageenan rat paw edema) and chronic (adjuvant-induced arthritis) models of inflammation. An extract of I. amara dose-dependently reduced the extent of edema in both models. In the chronic model, this was associated with a reduction in the inflammation mediators tumor necrosis factor-a, interleukin-1, and prostaglandin E2 and in the antioxidant biomarkers malondialdehyde and total nitrate/nitrite. Because arthritis was reported both clinically and experimentally to contribute towards different vascular complications, it was of interest to study ex vivo the sensitivity of aortic rings in our experimental setup towards norepinephrine, acetylcholine, and sodium nitroprusside. The aortic rings from arthritic rats showed no change in sensitivity to norepinephrine, but showed a reduced sensitivity to sodium nitroprusside and acetylcholine. To show whether the treatment of the arthritis would restore endothelial function, I. amara extract was shown to markedly reduce the reactivity to norepinephrine, but not to appreciably affect the reactivity towards sodium nitroprusside and it had a tendency towards normalizing reactivity to acetylcholine. Taken collectively, the findings imply an improvement in endothelial function and lend support to the use of the extract in rheumatic inflammatory conditions to help safeguard the integrity of the endothelium and reduce the risk of vascular complications

Keywords: Iberis amara; Brassicaceae; Adjuvant induced Arthritis; Vascular reactivity; Inflammation.

1374. Propolis Aqueous Extract Preserves Functional Integrity of Murine Intestinal Mucosa after Exposure to Ionizing Radiation

Mohamed T. Khayyal, Rania M. El-Hazek and Mona A. El-Ghazaly

Environmental Toxicology and Pharmacology, 40: 901-906 (2015) IF: 2.084

The ability of a specially prepared water propolis extract (PWE) to preserve the functional activity of the intestinal mucosa after radiation exposure was studied. PWE was given orally (650 mg/kg) to rats five days prior to irradiation by 6 Gy and continued for further two days. Rats were sacrificed 24 h later, intestinal segments were examined histologically and homogenates were used to assess relevant biochemical parameters reflecting intestinal injury. Irradiation led to a rise in the histological damage score, a rise in tissue TNF-α and TBARS, and a decrease in sucrase, alkaline phosphatase, GSH and cholecystokinin as well as a decrease in plasma citrulline. The findings reflect a decrease in intestinal functional activity. PWE preserved the intestinal integrity and largely protected against the changes induced in the histology damage score and all parameters measured, possibly as a result of the antioxidant and anti-inflammatory action of its caffeic acid content.

Keywords: Propolis; Gamma irradiation; Intestinal function; Oxidative stress; Anti-inflammatory.

1375. Neuroprotective Effects of Pioglitazone Against Transient Cerebral Ischemic Reperfusion Injury in Diabetic Rats: Modulation of Antioxidant, Anti-inflammatory, and Anti-Apoptotic Biomarkers

Ayman E. El-Sahar, Marwa M. Safar, Hala F. Zaki, Amina S. Attia and Afaf A. Ain-Shoka

Pharmacological Reports, 67: 901-906 (2015) IF: 1.928

Background: Recent growing consensus introduced thiazolidinediones, agonists of the nuclear receptor peroxisome proliferator-activated receptor gamma as promising candidates in the management of ischemia in various organs. Thereby, interest was raised to investigate the neuroprotective effects of pioglitazone against transient ischemia/reperfusion (I/R) injury in diabetic rats targeting mainly the oxidative-inflammatory-apoptotic cascades which are involved in this insult.

Methods: Forebrain ischemia was induced in streptozotocin-diabetic rats by occlusion of the bilateral common carotid arteries for 15min followed by 1h reperfusion. Pioglitazone (10mg/kg; po) was administered daily for 2 weeks prior to I/R.

Results: The drug alleviated hippocampal injury inflicted by diabetes and/or I/R injury where it suppressed nuclear factor kappa (NFκB), and consequently the downstream inflammatory cytokines tumor necrosis factor-a and interleukin-6.

In parallel, the anti-inflammatory cytokine interleukin-10 was elevated. Antioxidant potential of pioglitazone was depicted, where it reduced neutrophil infiltration, lipid peroxides, nitric oxide associated with replenished reduced glutathione.

Decline of excitatory amino acid glutamate content is a main finding which is probably mediated by the NFκB signaling pathway as well as improved oxidant status. Pioglitazone exerted an anti-apoptotic effect as reflected by the reduction of the cytosolic cytochrome c and the key downstream executioner caspase-3.

Conclusions: Pioglitazone is endowed with neuroprotective properties which are probably mediated by its antioxidant, anti-inflammatory, and anti-apoptotic mechanisms hence may provide a successful agent for the management of ischemic stroke.

Keywords: Apoptosis; Hippocampus; Ischemia/reperfusion; Pioglitazone.

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1376. H2S Donors Attenuate Diabetic Nephropathy in Rats: Modulation of Oxidant Status and Polyol Pathway

Marwa M. Safar and Rania M. Abd El-Salam

Background: Sulfurous mineral water and its main active ingredient sodium hydrosulfide (NaHS) are major sources of H2S. The present study aimed to explore their protective effect on one of the serious long-term complications of diabetes; diabetic nephropathy.

Methods: Sulfurous mineral water (as drinking water), NaHS (14 umol/kg/day; ip), and gliclazide (10 mg/kg; po) were administered daily for 6 weeks to streptozotocin (STZ)-diabetic rats.

Results: STZ-induced diabetes was associated with body weight reduction, hyperglycemia, overproduction of glycated hemoglobin, as well as decline in serum insulin, C-peptide, and insulin like growth factor-I. Besides, diabetes impaired kidney functions and imposed oxidative and nitrosative stress as manifested by elevated contents of renal thiobarbituric acid reactive substances and nitric oxide, parallel to reduced glutathione content.

These deleterious effects were antagonized by sulfurous water and to a better extent by NaHS. Activities of myeloperoxidase and sorbitol dehydrogenase were not altered by STZ or any of the treatments. However, STZ-induced diabetes was accompanied by an increment of aldose reductase which was only mitigated by gliclazide and NaHS. Histopathological examination of kidney sections corroborated the biochemical findings.

Conclusion: This study suggests a novel therapeutic approach for diabetic nephropathy using H_2S donors.

Keywords: Diabetic nephropathy; H(2)S; Insulin like growth factor-I (IGF-I); Polyol pathway; Sulfurous mineral water.

1377. Bone Marrow and Adipose-Derived Mesenchymal Stem Cells Alleviate Methotrexate-Induced Pulmonary Fibrosis in Rat: Comparison With Dexamethasone

Ebtehal M. Fikry, Marwa M. Safar, Wedad A. Hasan, Hala M. Fawzy and Ezz El-Din S. El-Denshary

The present study examined the therapeutic effects of bone marrow mesenchymal stem cells (BM-MSCs) and adipose-derived mesenchymal stem cells (AD-MSCs) in methotrexate (MTX)-induced pulmonary fibrosis in rats as compared with dexamethasone (Dex). MTX (14 mg/kg, as a single dose/week for 2 weeks, p.o.) induced lung fibrosis as marked by elevation of relative lung weight, malondialdehyde, nitrite/ nitrate, interleukin-4, transforming growth factor- β1, deposited collagen, as well as increased expression of Bax along with the reduction of reduced glutathione content and superoxide dismutase activity. These deleterious effects were antagonized after treatment either with BM-MSCs or AD-MSCs (2×10^6 cells/rat) 2 weeks after MTX to even a better extent than Dex (0.5 mg/kg/ for 7 days, p.o.). In conclusion, BM-MSCandAD-MSCs possessed antioxidant, antiapoptotic, as well as antifibrotic effects, which will probably introduce them as remarkable candidates for the treatment of pulmonary fibrosis.

Keywords: Pulmonary fibrosis; Mesenchymal stem cells; Methotrexate; Dexamethasone; Apoptosis.

1378. Paroxetine Ameliorates Changes in Hippocampal Energy Metabolism in Chronic Mild Stress-exposed Rats

Lobna H. Khedr, Noha N. Nassar, Ezzeldin S. El-Denshary and Ahmed M. Abd El-Tawab

The molecular mechanisms underlying stress-induced depression have not been fully outlined. Hence, the current study aimed at testing the link between behavioral changes in chronic mild stress (CMS) model and changes in hippocampal energy metabolism and the role of paroxetine (PAROX) in ameliorating these changes. Male Wistar rats were divided into three groups: vehicle control, CMS-exposed rats, and CMS-exposed rats receiving PAROX (10 mg/kg/day intraperitoneally). Sucrose preference, open-field, and forced swimming tests were carried out. Corticosterone (CORT) was measured in serum, while adenosine triphosphate and its metabolites, cytosolic cytochrome-c (Cyt-c), caspase-3 (Casp-3), as well as nitric oxide metabolites (NOx) were measured in hippocampal tissue homogenates. CMS-exposed rats showed a decrease in sucrose preference as well as body weight compared to control, which was reversed by PAROX. The latter further ameliorated the CMS-induced elevation of CORT in serum (91.71±1.77 ng/mL vs 124.5±4.44 ng/mL, P<0.001) as well as the changes in adenos-ine triphosphate/adenosine diphosphate (3.76±0.02 nmol/mg protein vs 1.07±0.01 nmol/mg protein, P<0.001). Furthermore, PAROX reduced the expression of Cyt-c and Casp-3, as well as restoring NOx levels. This study highlights the role of PAROX in reversing depressive behavior associated with stress-induced apoptosis and changes in hippocampal energy metabolism in the CMS model of depression.

Keywords: CMS; Adenine nucleotides; Apoptosis; Caspase-3; cytochrome-C; Hippocampus; Paroxetine; Rats.

1379. Protective Effect of the Herbal Preparation, STW 5, Against Intestinal Damage Induced by Gamma Radiation in Rats

Mona A. El-Ghazaly, Rania M. El-Hazek and Mohamed T. Khayyal

Purpose: STW 5 (marketed as Iberogast(®), Steigerwald Arzneimittelwerk GmbH, Darmstadt, Germany) is a herbal preparation reported to possess anti-inflammatory properties and antioxidant activity. We investigated the effect of STW 5 against intestinal injury induced after whole body exposure to ionizing radiation (IR).

Materials and Methods: Intestinal mucositis was induced in rats by irradiation at a level of 6 Gy. STW 5 (5 ml/kg) was delivered orally for 5 days before irradiation and 2 days after. Rats were sacrificed, jejunum homogenates were tested to assess

biochemical parameters indicating intestinal injury and jejunum segments were exposed to semi-quantitative histological examination.

Results: IR led to an increase in overall damage severity (ODS) score associated with a significant rise in tumor necrosis factor (TNF-a) and thiobarbituric acid reactive substances (TBARS) by 46% and 50% (p = 0.05), respectively, whereas the reduced glutathione (GSH), sucrase and alkaline phosphatase enzyme activities were significantly decreased by 68%, 76% and 25% (p = 0.05), respectively, in intestinal homogenates. IR led to a reduction of plasma citrulline. Pre-treatment with STW 5 guarded against the changes in ODS score and in all parameters measured.

Conclusion: Pre-treatment with STW 5 has the potential to decrease the severity of radiation-induced mucositis.

Keywords: Gamma radiation; STW 5; Mucositis.

1380. Lactoferrin Enhanced Apoptosis and Protected Against Thioacetamide Induced Liver Fibrosis in Rats

Alyaa Hessin, Rehab Hegazy, Azza Hassan, Nemat Yassin and Sanaa A. Kenawy

Backgropund: Liver fibrosis is the common pathologic consequence of all chronic liver diseases.

Aim: Lactoferrin (Lf) was investigated for its possible hepatoprotective effect against thioacetamide (TAA)-induced liver fibrosis rat model.

Material and Methods: Rats received TAA (200 mg/kg/biweekly, ip) for four successive weeks. Lf (200 mg/kg/day, p.o.) or vehicle (VHC) was administered for one month before and another month during TAA injection. Body weight and mortality rate were assessed during the month of TAA-intoxication. Thereafter, serum and liver tissues were analyzed for liver function, oxidative, fibrotic and apoptotic markers.

Results: Lf conserved rats against TAA-induced body weight-loss and mortality. Preservation of serum albumin, alkaline phosphatase and total bilirubin levels was also observed. Lf also protected rats against TAA-induced decrease in reduced glutathione and increase in malondialdehyde liver contents. Normal liver contents of hydroxyproline, nuclear factor kappa B and alpha fetoprotein; as markers of fibrosis; were increased with TAA and conserved with Lf-TAA. Lf maintained the normal architecture of the liver and immunohistochemical findings revealed increase in apoptotic bodies compared to TAA that favored necrosis.

Conclusion: In conclusion, Lf improved liver function, reduced oxidative stress and liver fibrosis, and enhanced apoptosis in rats with liver fibrosis, suggesting it to have useful therapeutic potential in patients with liver fibrosis..

Keywords: Alpha fetoprotein; Apoptosis; Lactoferrin; Liver fibrosis; NF-K B; Thioacetamide.

1381. Antiasthmatic Effects of Evening Primrose Oil in Ovalbumin-allergic Rats

Abeer A. A. Salama, Hala F. Zaki, Siham M. El-Shenawy, EL-Denshary E. S. M. and Ismaiel El-Kassaby Ismaiel

Asthma is one of the most common long-term conditions worldwide, which places considerable pressure on patients, communities and health systems. The uses of complementary and alternative medicines (CAMs) adjunctively to minimize the need for conventional therapies and hence avoid the profound side-effect profiles.Hence the effects of evening primrose oil (PO) alone or combined with dexamethasone (DEX) have been evaluated on bronchial asthma. we investigated the chronic effect of oval albumin (OVA) in a rat model of allergic asthma.

Rats were sensitized to OVA (1 mg/kg; i.p.) for 3 consecutive days, rats were pretreated orally with DEX (1mg/kg), PO alone in three doses(1, 2 and 3 g/kg), PO (1.5 g/kg) combined with DEX (0.5 mg/kg) and saline 1h before exposure to 1% OVA aerosol challenge (1 day/week for 3 weeks) then compared with positive control rats (OVA rats). Lung function tests were assessed after the last challenge and 24 h thereafter, blood films were prepared for assessment of eosinophil count and blood samples were collected for assessment of serum total protein as well as immunoglobulin E (Ig-E) levels. Lungs were isolated for histopathological study and also for determination of tumor necrosis factor-alpha (TNF-α) content in lung tissue.

Additionally the effects of test agents were evaluated in acetyl choline (ACh)-induced airway constriction. PO alone and combined with DEX modulate Ig-E, TNF-α, eosinophil recruitment, airway constriction and remodelling. In conclusions, PO alone or combined with a lower dose of DEX possesses antiasthmatic effects.

Keywords: Asthma; Evening primrose oil; Dexamethasone; Ovalbumin; Acetylcholine.

1382. Study of the Effect of Antidepressant Drugs and Donepezil on Aluminum-Induced Memory Impairment and Biochemical Alterations in Rats

Omar M. E. Abd El-Salam, Eman R. Youness, Fatma A. Morsy, Marwa M. Mahfouz and Sanaa A. Kenawy

Alzheimer's disease is the leading cause of dementia in the elderly. Depression is a common psychiatric disorder affecting individuals across life span and often arises in the context of pre-dementia, dementia, and Alzheimer's disease. The present study aimed to investigate the effects of the antidepressant drugs clomipramine (14.2 and 56.9 µmol/kg), fluoxetine (14.5 and 57.8 µmol/kg), and sertraline (14.6 and 58.4 µmol/kg) compared with acetylcholinesterase inhibitor donepezil (12 µmol/kg) on oxidative stress, memory impairment, and depressant-like behavior in a model of Alzheimer's disease induced by prolonged intraperitoneal administration of aluminum chloride (AlCl3) (10 mg/kg/day for 60 days) in rats.

Results: indicated that the latency to find the hidden platform in Morris water maze (MWM) test increased by 100 %, while the immobility duration in forced swimming test (FST) increased by 51 % in AlCl3-treated rats. The administration of AlCl3 resulted in increased brain malondialdehyde (MDA) by 58.6 % and nitric oxide (nitrite) concentrations by 71.7 %, while reduced glutathione (GSH) decreased by 35.6 % compared with the vehicle-treated group. Catalase and paraoxonase 1 (PON1) activities in the brain decreased by 41.8 and 18.3 %, respectively. Serum acetylcholinesterase (AChE) increased by 47.8 % and brain butyrylcholinesterase (BuChE) decreased by 23.1 % after AlCl$_3$ treatment. In AlCl$_3$-treated rats, memory performance in the

MWM test improved following donepezil and the highest dose of clomipramine, fluoxetine, and sertraline. The immobility duration in the FST was decreased by sertraline. Significant decrease in brain MDA occurred after treatment with clomipramine, fluoxetine, and a lower dose of sertraline. Reduced glutathione level increased by donepezil, clomipramine, and 57.8 µmol/kg fluoxetine. The level of nitric oxide decreased by donepezil (42.6 %), clomipramine (45.0 and 62.9 %), fluoxetine (21.9 and 40.9 %), and 14.6 µmol/kg sertraline (28.7 %). Catalase activity was restored by donepezil, fluoxetine, and sertraline and markedly increased by 56.9 µmol/kg clomipramine. Paraoxonase 1 activity was increased by 14.2 µmol/kg clomipramine. BuChE activity was unaltered, but AChE activity was decreased by donepezil, clomipramine, and fluoxetine compared with the $AlCl_3$ control group. $AlCl_3$ resulted in neurodegeneration (gliosis), extensive dark neurons with corkscrew dendrites, and degeneration of some Purkinje cell. Following donepezil treatment, no dark neurons were observed, while increased granular cell layer was observed after the administration of a high dose of clomipramine, fluoxetine, or sertraline. The results suggested that in rats treated with AlCl3, (i) donepezil, sertraline, clomipramine, and fluoxetine improve memory performance; (ii) sertraline was particularly effective in improving depressive-like behavior in this model and might be of value in the treatment of depressive symptoms associated with Alzheimer's disease; (iii) donepezil, clomipramine, and fluoxetine alleviated oxidative stress; and (iv) neurodegeneration in this model could be modulated by antidepressant drugs and donepezil.

Keywords: Aluminum chloride; Alzheimer's disease; Antidepressant drugs; Brain oxidative stress; Rats.

The National Cancer Institute

Dept. of Anesthesia & Intensive Care & Pain Healing

1383. Petoral Nerves I and II Blocks in Multmodal Analgesia for Breast Cance Surgery: A Randomised Clinical Trail

Ghada Mohammad Nabih Bashandy and Dina Nabil Abbas

Background: The pectoral nerves (Pecs) block types I and II are novel techniques to block the pectoral, intercostobrachial, third to sixth intercostals, and the long thoracic nerves. They may provide good analgesia during and after breast surgery. Our study aimed to compare prospectively the quality of analgesia after modified radical mastectomy surgery using general anesthesia and Pecs blocks versus general anesthesia alone.
Methods: One hundred twenty adult female patients scheduled for elective unilateral modified radical mastectomy under general anesthesia were randomly allocated to receive either general anesthesia plus Pecs block (Pecs group, n = 60) or general anesthesia alone (control group, n = 60).
Results: Statistically significant lower visual analog scale pain scores were observed in the Pecs group than in the control group patients. Moreover, postoperative morphine consumption in the Pecs group was lower in the first 12 hours after surgery than in the control group. In addition, statistically significant lower intraoperative fentanyl consumption was observed in the Pecs group than in the control group. In the postanesthesia care unit, nausea and vomiting as well as sedation scores were lower in the Pecs group compared with the control group. Overall, postanesthesia care unit and hospital stays were shorter in the Pecs group than in the control group.
Conclusions: The combined Pecs I and II block is a simple, easy-to-learn technique that produces good analgesia for radical breast surgery.
Keywords: Pecs block; Multimodal analgesia; Breast surgery.

1384. Awakening Properties of Isoflurane, Sevoflurane, and Desflurane in Pediatric Patients After Craniotomy for Supratentorial Tumours

Ayman A. Ghoneim, Magda S. Azer, Hossam Z. Ghobrial and Mohammed A. El Beltagy

Background: The aim of this prospective, comparative, randomized study was to compare the inhalational anesthetics isoflurane, sevoflurane, and desflurane in pediatric patients undergoing craniotomy for excision of supratentorial tumors. We assessed early postoperative recovery outcome, intraoperative hemodynamics, and degree of brain swelling, as well as postoperative vomiting and shivering.
Methods: Sixty patients scheduled for supratentorial brain tumor excision, were randomly allocated into 1 of 3 groups (20 patients each); isoflurane, sevoflurane, and desflurane group. After IV induction of anesthesia, maintenance was achieved using the inhalational anesthetic according to the allocated group. Tracheal extubation time was the primary endpoint. The secondary

endpoints included: emergence time and the interval time needed to reach Aldrete score >=9, intraoperative degree of brain swelling, intraoperative heart rate and mean arterial blood pressure, as well as postoperative vomiting and shivering. **Results**: The mean emergence time, extubation time, and the interval required to reach Aldrete score 9 were significantly shorter in the desflurane and sevoflurane groups than the isoflurane group. No statistically significant changes in the 3 groups regarding intraoperative brain swelling, hemodynamics, and postoperative shivering or vomiting were noted. **Conclusions**: Desflurane and sevoflurane can be used to facilitate early emergence from anesthesia in neurosurgical pediatric patients. Emergence times are shorter with desflurane or sevoflurane than with isoflurane. The patients who received desflurane or sevoflurane have similar intraoperative and postoperative incidence of adverse effects compared with those who received isoflurane. Thus, desflurane and sevoflurane can be considered as suitable for emergence in pediatric neurosurgical anesthesia.
Keywords: Neurosurgical anesthesia; Desflurane; Sevoflurane; Isoflurane; Pediatric neuroanesthesia.

1385. Implications of Recent Accumulating Knowledge About Endothelial Glycocalyx on Anesthetic Management

Ghada M. N. Bashandy

The endothelial glycocalyx is a labile, fine structure coating the luminal membrane of intact healthy vascular endothelium. For many decades, no physiologic importance was linked to this structure. It is crucial for vascular barrier function. There has been an immense interest in recent years for studying this important structure, and research is needed to disclose more information about it. Perioperative damage of the glycocalyx has been demonstrated, and is linked with morbidity and even mortality in surgical patients. Research on the glycocalyx should change many of the current perioperative management guidelines, and focusing on its protection is plausible. The present article reviews what we already know about the glycocalyx and how this knowledge has changed anesthesiologist perspectives.
Keywords: Endothelial glycocalyx; Third space loss; Sepsis; Perioperative fluid management.

1386. Comparative Study Between Sugammadex and Neostigmine in Neurosurgical Anesthesia in Pediatric Patients

Ayman A. Ghoneim and Mohammed A. El Beltagy

Background: Postoperative recurarization remains a risk following the use of the conventional neuromuscular blocking agents. In addition, none of the commonly used reversal agents, such as neostigmine or edrophonium are capable of reliably reversing profound blockade. The present comparative and randomized study investigated the use of sugammadex for reversing profound neuromuscular blockade (NMB) in pediatric neurosurgical patients undergone posterior fossa tumor excision.

Patients and Methods: Forty pediatric patients undergoing elective craniotomy for posterior fossa tumor excision were randomly divided into either of neostigmine or sugammadex group in which muscle relaxant was reversed at the end of anesthesia either with neostigmine 0.04 mg/kg added to atropine 0.02 mg/kg or sugammadex 4 mg/kg alone, respectively. The primary endpoint was the time from the administration of sugammadex or neostigmine to recovery of the train of four (TOF) ratio to 90% after rocuronium-induced neuromuscular block. Unpaired t-test was used to compare continuous variables between groups. Meanwhile, repeated ANOVA was used to detect intragroup differences.
Results: Patients in sugammadex group attained a TOF ratio 90% in statistically shorter time $(1.4 \pm 1.2$ min) than those in neostigmine group $(25.16 \pm 6.49$ min) for reversal of the rocuronium. Mean arterial pressure and heart rate were significantly higher in neostigmine group at 2, 5 and 10 min after administration of the reversal agents and returned nonsignificantly different after that. With no recurarization in any patient throughout the study period.
Conclusion: Sugammadex rapidly and effectively reverses rocuronium-induced NMB in pediatric patients undergoing neurosurgery when administered at reappearance of T2 of TOF at dose 4 mg/kg.
Keywords: Neostigmine; Reversal of neuromuscular blockade; Sugammadex.

Dept. of Clinical Pathology

1387. N-Acetyltransferase 2 (NAT2) Polymorphism As A Risk Modifier of Susceptibility to Pediatric Acute Lymphoblastic Leukemia

Azza M. Kamel, Gamal T. A. Ebid and Heba S. Moussa

Objectives: N-acetyltransferases (NAT) have been known to modify the risk to a variety of solid tumors. However, the role of NAT2 polymorphism in risk susceptibility to childhood acute lymphoblastic leukemia is still not well known. We performed a case-control study to determine if the common NAT2 polymorphisms play a role in altering susceptibility to pediatric ALL.
Methods: DNA of 92 pediatric ALL patients and 312 healthy controls were analyzed for the NAT2 polymorphisms using PCR-RFLP method.
Results: The wild type NAT2*4 was encountered in 8.6% of patients versus 11.8% controls (P=0.23). The rapid acetylator NAT2*12 803A>G, AG, GG and AG/GG were overrepresented in controls (P=0.0001; OR: 0.22, 0.19 & 0.21 respectively). NAT2*5D 341T>C and NAT2*11A 481C>T were of comparable frequencies. Their combination, NAT2*5A, a slow acetylator, both TCTT and CCCT were overrepresented in patients (P= < 0.001; OR: 15.8 & 17.9 respectively). NAT2*5B (803A>G, 341T>C, 481C>T), was overrepresented in controls (P= < 0.001; OR: 0.12). Apparently 803A>G ameliorated the combined effect of 341T>C and 481C>T. Similar effect was obtained with NAT2*5C (341T>A, 803A>G) (P= < 0.0001, OR: 0.11). For slow acetylator NAT2*7A 857G>A, GA and GA/AA were overrepresented in patients (P=0.009 & 0.01; OR: 2.74 and 2.72 respectively). NAT2*13 282C>T, NAT2*6B 590G>A and NAT2*14A 191G>A were of comparable frequencies. NAT2 282C>A in combination with NAT2 857G>A (NAT2*7B)

showed a synergistic effect in patients versus controls (p= < 0.0001; OR: 3.51).

Conclusion: NAT2 gene polymorphism(s) with slow acetylator phenotype increases the risk of development of ALL in Egyptian children.

Keywords: ALL; NAT2; Risk susceptibility; Single nucleotide polymorphism.

1388. Expression Profiling of Cancer-related Galectins in Acute Myeloid Leukemia

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Tumor Biology 2015: 7929-7939 (2015) IF: 3.611

Acute myeloid leukemia (AML) is the most common type of leukemia in adults with the lowest survival rate of all the leukemias. It is a heterogeneous disease in which a variety of cytogenetic and molecular alterations have been identified. Some galectins were previously reported to have important roles in cancer-like neoplastic transformation, tumor cell survival, angiogenesis, and tumor metastasis. Previous studies have showed that some galectin family members play a role in various types of leukemia. The present study aims at evaluating and clarifying the diagnostic and prognostic value of the expression of cancer-related galectins in relation to the clinicopathological characters of AML patients. Quantitative real-time polymerase chain reaction (qRT-PCR) was used to detect expression profile of eight galectin family members (galectin-1, -2, -3, -4, -8, -9, -12, and -13) in 53 newly diagnosed de novo AML patients. The samples were collected from the inpatient clinic at National Cancer Institute (NCI), Cairo University (CU), diagnosed between July 2012 and May 2013. Our results show that patients with lower LGALS12 gene expression have a lower overall survival than those with higher expression (P value <0.026). Moreover, a statistically significant association between the LGALS4 gene expression and patient age is found. Hence, the higher expression of LGALS4 gene is associated with younger age (adjusted P value <0.001). In conclusion, galectin-12 may be a potential prognostic marker for AML.

Keywords: AML; Galectin expression; Galectins; qRT-PCR.

1389. Significance of Post-resection Tissue Shrinkage on Surgical Margins of Oral Squamous Cell Carcinoma

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Journal of Cranio-maxillofacial Surgery, 43(4): 475-482 (2015) IF: 2.933

Background: Resecting oral squamous cell carcinoma (SCC) with an appropriate margin of uninvolved tissue is critical in preventing local recurrence and in making decisions regarding postoperative radiation therapy. This task can be difficult due to the discrepancy between margins measured intraoperatively and those measured microscopically by the pathologist after specimen processing.

Material and Methods: A total of 61 patients underwent resective surgery with curative intent for primary oral SCC were included in this study. All patients underwent resection of the tumor with a measured 1-cm margin. Specimens were then submitted for processing and reviewing, and histopathologic margins were measured. The closest histopathologic marginwas compared with the in situ margin (1 cm) to determine the percentage discrepancy.

Results: The mean discrepancy between the in situ margins and the histopathological margins of all close and positive margins were 47.6% for the buccal mucosa (with a P value corresponding to 0.05 equaling 2.1), which is statistically significant, 4.8% for the floor of mouth, 9.5% for the mandibular alveolus, 4.8% for the retromolar trigon, and 33.3% for the tongue.

Conclusion: There is a significant difference among resection margins based on tumor anatomical location. Margins shrinkage after resection and processing should be considered at the time of the initial resection. Tumors located in the buccal mucosa show significantly greater discrepancies than tumors at other sites. These findings suggest that it is critical to consider the oral site when outlining margins to ensure adequacy of resection. Buccal SCC is an aggressive disease, and should be considered as an aggressive subsite within the oral cavity, requiring a radical and aggressive resective approach.

Keywords: Oral squamous cell carcinoma; Margins shrinkage; Resection margins.

1390. Prognostic Value of A CYP2B6 Gene Polymorphism in Patients with Acute Myeloid Leukemia

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Asian Pacific Journal of Cancer Prevention, 16: 4583-4587 (2015) IF: 2.514

Background: The objectives of this study aimed to detect a CYP2B6 polymorphism in de novo cases of acute myeloid leukemia patients and identify any role in disease progression and outcome.

Materials and Methods: DNA was isolated from peripheral blood of 82 newly diagnosed acute myeloid leukemia cases and the CYP2B6 G15631T gene polymorphism was assayed by PCR restriction fragment length polymorphism (PCR-RFLP).

Results: The frequency of the GG genotype (wild type) was 48 (58.5%) and that of the mutant type T allele was 34 (41.9%). GT genotype heterozygous variants were found in 28 (34%), and TT genotype homozygous variants in 6 (7.3%) cases. We found no significant association between the CYP2B6 G15631T polymorphism and complete response (CR) (p-value=0.768), FAB classification (p-value=0.51), cytogenetic analysis (p-value=0.673), and overall survival (p-value=0.325). Also, there were no significant links with early toxic death (p-value=0.92) or progressionfree survival (PFS) (p-value=0.245).

Conclusions: Our results suggest that the CYP2B6 polymorphism has no role in disease progression, therapeutic outcome, patient free survival, early toxic death and overall survival in acute myeloid leukemia patients.

Keywords: CYP2B6 G15631T; Aml; Prognosis; PCR/RFLP.

1391. Nanotechnology Applications in Hematological Malignancies (Review)

Ahmed Samir, Basma M. Elgamal, Hala Gabr and Hatem E. Sabaawy

A major limitation to current cancer therapies is the development of therapy-related side-effects and dose limiting complications. Moreover, a better understanding of the biology of cancer cells and the mechanisms of resistance to therapy is rapidly developing. The translation of advanced knowledge and discoveries achieved at the molecular level must be supported by advanced diagnostic, therapeutic and delivery technologies to translate these discoveries into useful tools that are essential in achieving progress in the war against cancer. Nanotechnology can play an essential role in this aspect providing a transforming technology that can translate the basic and clinical findings into novel diagnostic, therapeutic and preventive tools useful in different types of cancer. Hematological malignancies represent a specific class of cancer, which attracts special attention in the applications of nanotechnology for cancer diagnosis and treatment. The aim of the present review is to elucidate the emerging applications of nanotechnology in cancer management and describe the potentials of nanotechnology in changing the key fundamental aspects of hematological malignancy diagnosis, treatment and follow-up.
Keywords: Nanotechnology; Hematological malignances.

1392. HLA-E Polymorphism and Clinical Outcome After Allogeneic Hematopoietic Stem Cell Transplantation in Egyptian Patients

Ghada I. Mossallam, Raafat Abdel Fattah, Alaa El-Haddad and Hossam K. Mahmoud

Human leukocyte antigen-E (HLA)-E in a non-classical major histocompatibility complex (MHC) class I (Ib) molecule. HLA-E-peptide complex acts as a ligand for natural killer (NK) cells and CD8+ T lymphocytes playing a dual role in natural and acquired immune responses. The difference in expression levels between HLA-E alleles was suggested to have impact on transplantation outcome. The aim of the study is to evaluate the clinical effect of HLA-E alleles on transplantation in a group of Egyptian patients. HLA-E genotyping was analyzed in eighty-eight recipients of stem cell transplantation using polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP). HLA-E*01:03 allele showed a trend towards lower cumulative incidence of relapse at 2 years compared to homozygous HLA-E*01:01 genotype (8% versus 21.5%, p = 0.09, HR: 0.30, 95% CI: 0.91–1.69). HLA-E was the only factor showing near significant association with relapse incidence. HLA-E polymorphism did not affect the cumulative incidence of acute GVHD grades II-IV at 100 days, the 2-year cumulative incidence of extensive chronic GVHD, transplant related mortality (TRM) or overall survival (OS).
Conclusion: the suggested association of HLA-E polymorphism with reduced risk of relapse needs verification in a larger cohort. However, its proposed role in GVL helps better understanding of alloreactivity of T cells and NK cells and their implication in immunotherapy post allogeneic hematopoietic stem cell transplantation.
Keywords: HLA-E; Hematopoietic stem cell transplantation; Graft versus leukemia (GVL); Relapse.

1393. Prevalence of the Frequency of JAK2 (V617F) Mutation in Different Myeloproliferative Disorders in Egyptian Patients

Gamal T Ebid, Mohamed Ghareeb, Omina Salaheldin and Mahmoud M Kamel

Background and objectives: Detection of chromosomal abnormalities in myeloproliferative disorders is important for proper diagnosis of these disorders. This study has investigated the presence of JAK2 mutation (V617F) in Egyptian patients with myeloproliferative disorders referred to National Cancer institute, Cairo University.
Methods: The study involved 110 cases of Philadelphia negative Myeloproliferative diseases (MPDs), 70 cases with Polycythemia Vera (PV), 24 cases with Essential Thrombocytosis (ET) and 16 cases with Idiopathic Myelofibrosis (IMF) and 20 cases as a control group which represented as; (10 cases with secondary erythrocytosis, 1 case with reactive thrombocytosis, 4 cases as normal control and 5 as Philadelphia positive Chronic Myeloid Leukemia cases), they were collected from National Cancer Institute (NCI) over 3 years. We used ARMS technique for mutation detection.
Results: The frequency of the V617F JAK2 mutation was highest in patients with PV where 56 out of 70 cases (80%) carried the mutation, followed by ET with 6 of 24 (25) and IMF with 2 of 16 (12.5%) . None of the cases with secondary Erythrocytosis, reactive thrombocytosis, the normal controls or Philadelphia positive CML cases carried the mutation.
Conclusions: Our results are concordant with international published results for detection of this mutation. It is unequivocal now that V617F is met in many MPDs especially PRV. Finding this mutation in those patients is thought to have a big impact on the diagnosis and treatment of these disorders.
Keywords: JAK2 mutation; Myeloproliferative disorders; Polycythemia vera; Essential thrombocytosis; Idiopathic myelofibrosis (IMF); ARMS; Egypt.

1394. Addressing the Challenge of Financial Sustainability in Biobanking

Antonio H. Campos, Marshall Schreeder, Alison Parry-Jones, Ahmed S. Abdelhafiz,Dianna Larson, Barbara Pruetz, Timothy Geddes, Ayat Salman and Anthoula Lazaris

Biospecimens and data are increasingly needed to support biomedical research and clinical care. Biobanks are created to support the ready access to fit-for-purpose biospecimens and data for drug target identification, drug discovery and development, and are vital in efforts focused on precision medicine. To support the increasing need for quality biospecimens and data, the infrastructure of biobanking must be strong and sustainable. Each biobank should be supported with a business model that is

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deliberately and methodically planned in advance of the collection, processing, storage and usage of the biospecimens and data. The business plan should address ways to achieve sustainability in operations, social acceptance, as well as financial support over the intended duration of the repository. Financial sustainability may be achieved through various means including institutional support, short and long-term grants, cost recovery, and sales of services. Biopreservation and Biobanking asked several biobanking professionals their views on financial sustainability and the means to achieve it as addressed in their business plan

Keywords: Biobanking; Financial sustainability.

1395. Parathyroid Gland Autotransplantation After Total Thyroidectomy in Surgical Management of Hypopharyngeal and Laryngeal Carcinomas: A Case Series

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Annals of Medicine and Surgery, 4: 85-88 (2015)

Background and objectives: Total thyroidectomy is indicated in most cases with postcricoid carcinoma, circumferential hypopharyngeal carcinoma and in advanced laryngeal carcinoma. Persistent hypoparathyroidism is a frequent complication after total thyroidectomy which is difficult to manage unlike hypothyroidism. This study was to assess the feasibility of parathyroid gland autotranplantation after total thyroidectomy in advanced carcinomas and their effectiveness in preventing persistent hypoparathyroidism.

Methods: This study included 26 patients with hypopharyngeal and laryngeal carcinoma presented to National Cancer Institute, Cairo University. Total thyroidectomy and total parathyroid gland excision were performed as a part of adequate oncologic surgical procedure. The parathyroid glands were identified, resected and stored in iced saline. Histological confirmation was necessary before implantation into separated muscle pockets in the anterior forearm muscles. Regular samples were drawn to assess serum parathormone and calcium levels.

Results: All patients experienced hypocalcaemia within 1e5 days after operation. Only one patient experienced parathyroid graft failure while the remaining patients were normocalcemic during follow up after surgery, indicating functioning parathyroid grafts.

Conclusions: Parathyroid gland autotranplantation is a simple safe technique with high success rate in preventing persistent hypoparathyroidism after total thyroidectomy in surgical management of advanced hypopharyngeal and laryngeal carcinomas.

Keywords: Parathyroid; Autotransplantation; Hypopharyngeal; Laryngeal; Carcinoma.

Dept. of Diagnostic Radiation Oncology

1396. ^{18}F-FDG Uptake at the Surgical Margin After Hepatic Resection: Patterns of Uptake and Differential Diagnosis

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European Radiology Springer, 25, 8: 2453-2459 (2015) IF: 4.014

Objective To evaluate the patterns of 18F-FDG uptake at the surgical margin after hepatectomy to identify features that may differentiate benign and malignant uptake.

Methods Patients who had undergone a PET/CT after hepatectomy were identified. Delay between resection and PET/CT, presence of uptake at the surgical margin, pattern of uptake, and maximal standardized value were recorded. The PET/CT findings were correlated with contrast-enhanced CT or MRI.

Results There were 26 patients with increased 18F-FDG uptake; uptake was diffuse in seven and focal in 19. Diffuse uptake was due to inflammation in all cases. Focal uptake was due to recurrence in 12 and inflammation in seven cases. Defining a focal pattern only as a positive for malignancy yielded 100 % sensitivity, 87 % specificity, 37 % false positive rate. As expected, SUVmax was significantly higher for recurrence than inflammation, but did overlap. Contrast-enhanced CT allowed differentiation between malignant and benign uptake in all cases.

Conclusion F-FDG uptake after hepatectomy does not equate to recurrence and yields a high false positive rate. Diffuse uptake did not require additional evaluation in our sample. Focal uptake, however, may be due to recurrence; differentiating benign and malignant nodular uptake relies on optimal contrast-enhanced CT or MRI.

Keywords: Hepatectomy; Positron-emission tomography; Neoplasms; 18F-fluorodeoxyglucose; Computed tomography.

Dept. of Radiation Oncology

1397. Assessment of Radiation Doses to the Para-Aortic, Pelvic, and Inguinal Lymph Nodes Delivered By Image-Guided Adaptive Brachytherapy in Locally Advanced Cervical Cancer

Sandy M.I. Mohamed, Torben Aagaard, Lars U. Fokdal, Erik M. Pedersen, Jacob C. Lindegaard and Kari Tanderup

Brachytherapy, 14: 56-61 (2015) IF: 2.758

Purpose:This study evaluated the dose delivered to lymph nodes (LNs) by brachytherapy (BT) and the effect of BT image-guided optimization on the LN dose.

Methods and Materials: Twenty-five patients with locally advanced cervical cancer were retrospectively analyzed, 16 patients of them had LN involvement. The patients received whole pelvis intensity-modulated radiation therapy (45-50 Gy/25-30 fx) to whole pelvis and two fractions of MRI pulsed-dose-rate BT. The delineated LN groups were para-aortic, inguinal, common iliac (CI), external iliac, internal iliac, obturator, and presacral. For each LN group, D98%, D50%, and D2% (the dose that covers 98%, 50%, and 2% of the volume, respectively) were evaluated for optimized and standard BT plans. The correlation between total reference air kerma (TRAK) and D50% of the LN groups was evaluated.

Results: BT contributed considerable dose (mean D50% was 3.8-6.2 Gy equivalent total dose in 2-Gy fractions) to the pelvic LN (external iliac, internal iliac, obturator, and presacral) in optimized plans, whereas less-dose contribution to CI, para-aortic, and inguinal (mean D50% was 0.5-1.9 Gy equivalent total dose in 2-Gy fractions) was observed. Optimized plans delivered less dose to the LNs as compared with standard plans, although differences only amounted to a mean of 0.2-0.9 Gy (D50%). TRAK showed a significant correlation with LN D50% for all LN

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groups except CI, although only 19-38% of the dose variation could be explained by the TRAK.

Conclusions: BT contributes considerable dose to pelvic LNs and should be considered in the evaluation of total LN doses.

Keywords: Cervical cancer; Brachytherapy; MRI guided; Radiation dose; Para-aortic lymph node; Pelvic lymph node; Inguinal lymph node.

1398. Parametrial Boosting in Locally Advanced CervicalCancer: Combined Intracavitary/Interstitial BrachytherapyVs. Intracavitary Brachytherapy Plus External Beam Radiotherapy

Sandy Mohamed, Jesper Kallehauge, Lars Fokdal, Jacob Christian Lindegaard and Kari Tanderup

Purpose Parametrial boost (PB) with external beam radiotherapy (EBRT) aims to increase the dose in the parametrial regions where the contribution from intracavitary brachytherapy (IC BT) is insufficient. An alternative technique for parametrial boosting is combined intracavitary and interstitial (IC–IS) BT. We compared doses delivered by IC BT plus EBRT PB with doses delivered by IC–IS BT.

Methods and Materials We reviewed 51 consecutive patients with locally advanced cervical cancer with parametrial involvement at diagnosis. At BT, 23 patients had persistent parametrial involvement and were treated with IC–IS BT. For the 23 patients, we simulated a treatment of IC BT combined with EBRT PB and compared it with the delivered IC–IS BT. Equivalent total doses in 2-Gy fractions of the target and organs at risk were evaluated, and the normal tissue volume irradiated to at least 60 Gy (V60).

Results The mean high-risk clinical target volume D90 was comparable (p = 0.8) for both techniques. However, with the EBRT PB scenario, 3 patients received high-risk clinical target volume D90 of <79 Gy, whereas IC–IS BT resulted in D90 of >84 Gy for all patients. Organs at risk D2cm3 were significantly higher by a mean of 4–6 Gy (p < 0.001) with EBRT PB. The PB scenario resulted in a significantly higher V60 of 594 ± 596 cm3 as compared with 228 ± 82 cm3 with IC–IS BT (p = 0.004).

Conclusions Combined IC–IS BT is superior than IC BT + EBRT PB both in terms of organ sparing and target coverage. The IC–IS BT was more conformal with less normal tissue exposure to intermediate doses (V60).

Keywords: Cervical cancer; Image-guided brachytherapy; Interstitial brachytherapy; Midline block; Parametrial boost.

Dept. of Tumor Biology

1399. Involvement of ATM in Homologous Recombination After End Resection and RAD 51 Nucleofilament Formation

A. Bakr, C. Oing, S. K¨ocher, K. Borgmann, I. Dornreiter, C. Petersen, E. Dikomey and W.Y. Mansour

Ataxia-telangiectasia mutated (ATM) is needed for the initiation of the double-strand break (DSB) repair by homologous recombination (HR). ATM triggers DSB end resection by stimulating the nucleolytic activity of CtIP and MRE11 to generate 3-ssDNA overhangs, followed by RPA loading and RAD51 nucleofilament formation. Here we show for the first time that ATM is also needed for later steps in HR after RAD51 nucleofilament formation. Inhibition of ATM after completion of end resection did not affect RAD51 nucleofilament formation, but resulted in HR deficiency as evidenced by (i) an increase in the number of residual RAD51/H2AX foci in both S and G2 cells, (ii) the decrease in HR efficiency as detected by HR repair substrate (pGC), (iii) a reduced SCE rate and (iv) the radiosensitization of cells by PARP inhibition. This newly described role for ATM was found to be dispensable in heterochromatin-associated DSB repair, as KAP1-depletion did not alleviate the HR-deficiency when ATM was inhibited after end resection. Moreover, we demonstrated that ATR can partly compensate for the deficiency in early, but not in later, steps of HR upon ATM inhibition. Taken together, we describe here for the first time that ATM is needed not only for the initiation but also for the completion of HR.

Keywords: Atm; DSB repair; HR; RAD51.

1400. 5-Fluorouracil Sensitizes Colorectal Tumor Cells Towards Double Stranded DNA Breaks by Interfering With Homologous Recombination Repair

UpadhyayulaSai Srinivas, Jerzy Dyczkowski, Tim Bei ßbarth, Jochen Gaedcke, Wael Y. Mansour, Kerstin Borgmann and Matthias Dobbelstein

Malignant tumors of the rectum are treated byneoadjuvantradiochemotherapy. This involves a combination of 5-fluorouracil (5-FU) and double stranded DNA-break (DSB)-inducing radiotherapy. Here we explored how 5-FU cooperates with DSBinductionto achieve sustainable DNA damage in colorectal cancer (CRC) cells.

After DSB induction by neocarzinostatin, phosphorylated histone 2AX (γ-H2AX) rapidly accumulated but then largely vanished within a few hours. In contrast, when CRC cells were pre-treated with 5-FU, gammaH2AX remained for at least 24 hours.

GFP-reporter assays revealed that 5-FU decreases the efficiency of homologous recombination (HR) repair. However, 5-FU did not prevent the initial steps of HR repair, such as the accumulation of RPA and Rad51 at nuclear foci. Thus, we propose that 5-FU interferes with the continuation of HR repair, e. g. the synthesis of new DNA strands. Two key mediators of HR, Rad51 and BRCA2, were found upregulated in CRC biopsies as compared to normal mucosa. Inhibition of HR by targeting Rad51 enhanced DNA damage upon DSB-inducing treatment, outlining an alternative way of enhancing therapeutic efficacy. Taken together, our results strongly suggest that interfering with HR represents a key mechanism to enhance the efficacy when treating CRC with DNA-damaging therapy.

Keywords: Colorectal cancer; Radiochemotherapy; Homologous recombination repair; 5-fluorouracil; RAD51.

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1401. Aberrant Expression of Cancer Stem Cell Markers (CD44, CD90, and CD133) Contributes to Disease Progression and Reduced Survival In Hepatoblastoma Patients: 4-Year Survival Data

Abeer A. Bahnassy, Mohamed Fawzy, Mohamed El-Wakil, Abdel Rahman N. Zekri, Ahmed Abdel-Sayed and Marwa Sheta

Hepatoblastoma (HB) is an embryonal tumor of the liver in children. Prognosis andresponse to treatment in HB are highly variable. Cancer stem cells (CSCs) constitute a population of cells, which contribute to the development and progression of many tumors. However, their role in HB is not well defined yet. We assessed the prognostic and predictive values of some CSC markers in HB patients. Protein and messenger RNA expressions of the CSC markers CD133, CD90, and CD44 were assessed in 43 HB patients and 20 normal hepatic tissues using immunohistochemistry and quantitative real-time polymerase chain reaction. The expression levels of these markers were correlated to standard prognostic factors, patients' response to treatment, overall survival (OS), and disease-free survival (DFS). CD44, CD90, and CD133 proteins were detected in 48.8%, 32.6%, and 48.8% compared with 46.5%, 41.7%, and 58.1% RNA, respectively (concordance, 77.8%–96%). None of the normal tissue samples was positive for any of the markers. Significant correlations were reported between a-fetoprotein and both CD44 and CD133 (P 5 0.02) as well as between tumor types CD90 and CD133 (P 5 0.009). Reduced OS correlated with CD44, CD90, and CD133 expressions (P ,0.001), advanced stage (P , 0.001), response to treatment (P , 0.001), and total excision of the tumor. Reduced DFS correlated with CD44 and CD133 expressions (P ,0.001) only. In conclusion, CD133, CD44, and CD90 could be used as prognostic and predictive markers in HB. High expression of these markers is significantly associated with poor response to treatment and reduced survival. Moreover, complete surgical resection and systemic chemotherapy are essential to achieve good response and prolonged survival, especially in early stage patients.

1402. High Levels of RAD51 Perturb DNA Replication Elongation and Cause Unscheduled Origin Firing Due To Impaired CHK1 Activation

Ann Christin Parplys, Jasna Irena Seelbach, Saskia Becker, Matthias Behr, Agnieszka Wrona, Camilla Jend, Wael Yassin Mansour, Simon Andreas Joosse, Horst-Werner Stuerzbecher, Helmut Pospiech, Cordula Petersen, Ekkehard Dikomey and Kerstin Borgmann

In response to replication stress ATR signaling through CHK1 controls the intra-S checkpoint and is required for the maintenance of genomic integrity. Homologous recombination (HR) comprises a series of interrelated pathways that function in the repair of DNA double strand breaks and interstrand crosslinks. In addition, HR, with its key player RAD51, provides critical support for the recovery of stalled forks during replication. High levels of RAD51 are regularly found in various cancers, yet little is known about the effect of the increased RAD51 expression on intra-S checkpoint signaling. Here, we describe a role for RAD51 in driving genomic instability caused by impaired replication and

intra-S mediated CHK1 signaling by studying an inducible RAD51 overexpression model as well as 10 breast cancer cell lines. We demonstrate that an excess of RAD51 decreases I-Sce-I mediated HR despite formation of more RAD51 foci. Cells with high RAD51 levels display reduced elongation rates and excessive dormant origin firing during undisturbed growth and after damage, likely caused by impaired CHK1 activation. In consequence, the inability of cells with a surplus of RAD51 to properly repair complex DNA damage and to resolve replication stress leads to higher genomic instability and thus drives tumorigenesis.

Keywords: RAD51; DNA replication; CHK1.

1403. Cu (I) Catalyzed Alkyne-Azide 1,3-Dipolar Cycloaddition (CuAAC): Synthesis of 17*a*-[1-(Substituted Phenyl)-1,2,3-Triazol-4-Yl]-19-Nor-Testosterone-17β-Yl Acetates Targeting Progestational and Antipro-Liferative Activities

Z.H. Mohamed, Nawal A. El-Koussi, Nadia M. Mahfouz, Adel F. Youssef, Gehad A. Abdel Jaleel and Samia A. Shouman

The progestational potency and selectivity of synthetic steroidal agonists can be enhanced by even larger chemical moieties at 17α-position of the steroid backbones. Hereby a series **5a-c** and **6a-c** of novel 17α-[1-(substituted phenyl)-1,2,3-triazol-4-yl]-19-nortestosterone-17β-yl acetates were designed and synthesized using click chemistry approach searching progestogenic derivatives with potential anticancer activity. Compounds **5a,b** and **6a,c** have affected to different extents the three histopatho-logical parameters considered for evaluation of their progestational activity. The compounds **5a,b** and **6a,c** showed modifications in rat uterus at 35.7–34.8 nM levels with privileged endometrial thickening effect and least change of uterine weight relative to NEA at 52.9 nM level. Up to 40 mg/kg dose compounds **5b** and **6c** were non-toxic. Molecular docking of the ligands in PR showed in the majority of cases a conformational fitting into the active site different from that of the reference steroid NEA. Compound **6b** revealed about 46.4% growth inhibition of CNS cancer SNB-75 cell line, 56% growth inhibition of renal cancer A498 cell line and 56.7% growth inhibition of prostate cancer PC-3 cell line which was mediated by cell cycle arrest. Drugability of the screened compounds showed tolerated results after being challenged to diverse physicochemical parameters.

Keywords: Click chemistry; Aza steroids; Progestational activity; Docking; Anticancer activity.

1404. The Impact of Repeated Autologous Infusion of Haematopoietic Stem Cells in Patients with Liver Insufficiency

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Introduction: The worldwide shortage of donor livers has prompted the search for alternative cell therapies. Previous data from our laboratory proved a supportive role for stem cell therapy in the treatment of end-stage liver disease patients. Therefore; this study was conducted to assess the clinical and biochemical effects of repeated stem cell infusion.

Methods: Ninety patients with liver cirrhosis were randomized to receive either one session treatment (G-I) or two sessions 4 months apart (G-II) of autologous haematopoietic stem cells (HSCs) transplantation and a control group(G-III) who received regular liver treatment. G-CSF was administered to transplanted patients before infusion; HSCs were isolated from 400 cc bone marrow (BM) aspirate. CD34+/CD133+ cells were purified: 50 % of the cells were infused locally in the portal vein on the same day and the other 50 % were differentiated to MSC and infused systemically in a peripheral vein (one session treatment G-I). In G-II, the same process was repeated after 4 months from the first treatment (two session's treatment G-II). Liver function was monitored for 12 months after stem cell therapy (SCT).

Results: Statistically significant improvement was reported in the transplanted patients (G-1) as regards the mean serum albumin, bilirubin and INR levels which started to improve after 2 weeks of treatment and continued to improve till the 6th month in the single infusion group. The two sessions infused group (G-II) showed sustained response which continued throughout the all follow-up period (12 month). By the end of the study, 36.7 % of the patients in G-I and 66.7 % in G-II showed improvement in the degree of ascites compared to the control group (G-III). We also reported an improvement in the hepatic functional reserve as assessed by the Child-Pugh and MELD score. Safety of the procedure was evidenced by the low incidence of complications encountered.

Conclusion: In patients with end-stage liver disease, the repeated infusion with combined routes portal and peripheral veins has a beneficial effect on liver functions with minimal adverse events and more lasting clinical efficacy after repeated HSCs infusion.

1405. Targeting Glycolysis by 3-Bromopyruvate Improves Tamoxifen Cytotoxicity of Breast Cancer Cell Lines

Yasmin M. Attia, Hanan S. EL-Abhar, Mahmoud M. Al Marzabani and Samia A. Shouman

Background: Tamoxifen is the standard endocrine therapy for ER+ breast cancer; however, many women still relapse after long-term therapy. 3-Bromopyruvate, a glycolytic inhibitor, has shown high selective anti-tumor activity in vitro, and in vivo. The aim of this study was to evaluate the possible augmentation of the effect of tamoxifen via reprograming cancer cell metabolism using 3-bromopyruvate.

Methods: An in vitro screening of antitumor activity as well as the apoptotic, anti-metastatic, and anti-angiogenic potentials of the combination therapy were carried out using different techniques on breast cancer cell lines MCF7and T47D. In addition the antitumor effect of the combined therapy was done on mice bearing tumor.

Results: Our results showed modulation in apoptosis, angiogenesis and metastatic potential by either drug alone; however, their combination has surpassed that of the individual one. Combination regimen enhanced activated caspases-3, 7 and

9, as well as oxidative stress, signified by increased malondialdehyde and decreased glutathione level. Additionally, the angiogenesis and metastasis markers, including hypoxia inducing factor-1a, vascular endothelia growth factor, and metaloproteinases-2 and 9 were decreased after using the combination regimen. These results were further confirmed by the in vivo study, which depicted a decrease in the tumor volume and angiogenesis and an increase in oxidative stress as well.

Conclusion: 3-bromopyruvate could be a valuable compound when added with tamoxifen in breast cancer treatment

Keywords: Breast cancer; Tamoxifen; 3-Bromopyruvate; Apoptosis; Angiogenesis; Mmps.

1406. Molecular Biomarkers for Prediction of Response to Treatment and Survival in Triple Negative Breast Cancer Patients from Egypt

Abeer Bahnassy, Marwa Mohanad, Manal F. Ismail, Sabry Shaarawy, Ahmed El-Bastawisy and Abdel-Rahman N. Zekri

Background: Triple negative breast cancer (TNBC) is an aggressive phenotype of breast cancer with reduced survival and poor prognosis. Increased VEGF-A, IGF-I, IGF-IR and TGF-β1 expressions were detected in breast cancer. However, little is known about their prognostic and predictive roles in TNBC. Aim:Weassessed the possible prognostic and predictive values of VEGF-A, IGF-I/IGF-IR and TGF-β1 inTNBCcases by measuring their protein and mRNA expression in TNBC and non-TNBC cases.

Methods: VEGF-A, IGF-I, IGF-IR and TGF-β1 RNA and their corresponding proteins were assessed in 43 TNBCs, 53 non-TNBCs and 30 normal breast tissues (NBT) by real time PCR (qPCR) and immunohistochemistry (IHC); respectively. Results were related to clinico-pathological factors, response to treatment and survival rates.

Results: Increased mRNA expression of VEGF-A, IGF-I, and IGF-IR was significantly higher in TNBC (65.1%, 65.1%, and 72.1%) than non-TNBC (28.1%, 33.96% and 28.3%) and NBT (0.00%) (P b 0.001). Similarly, TNBC patients were significantly associated with high expression of VEGF-A, IGF-I, and IGF-IR proteins (67.44%, 62.79% and 83.72%) than non-TNBC (20.75%, 35.86% and 20.75%) and NBT (0.00%) (P b 0.001). Protein and RNA expression levels of all studied markers showed high concordance in all investigated patients (correlation coefficient exceeding 0.5 and 0.4, respectively). In the TNBC group, metastasis and poor response to treatment were significantly associatedwith VEGF-A (P b 0.001, P=0.007, respectively), IGF-I (P b 0.001, P b 0.001, respectively), IGF-IR (P = 0.001, P = 0.015, respectively) and TGF-β1 (P b 0.001, P = 0.007, respectively) protein levels. Multivariate logistic regression showed that IGF-I was the only independent prognostic factor for reduced OS (P= 0.034) and DFS (P= 0.026) in the TNBC patients.

Conclusions: VEGF-A, IGF-I and IGF-IR play an important role in the development and progression of TNBC compared to non-TNBC. Therefore, they could be used as prognostic and predictive biomarkers as well as candidates for targeted therapy. However, only IGF-I can predict survival in those patients.

Keywords: Triple negative breast cancer; VEGF-A; IGF-I/IGF-IR; TGF-β1; Prognostic factor; Predictive marker.

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1407. Differentially Expressed Genes in Metastatic Advanced Egyptian Bladder Cancer

Abdel-Rahman N Zekri, Zeinab Korany Hassan, Abeer A Bahnassy, Hussein M Khaled, Mahmoud N El-Rouby, Rasha M Haggag and Fouad M Abu-Taleb

Background: Bladder cancer is one of the most common cancers worldwide. Gene expression profiling using microarray technologies improves the understanding of cancer biology. The aim of this study was to determine the gene expression profile in Egyptian bladder cancer patients.

Materials and Methods: Samples from 29 human bladder cancers and adjacent non-neoplastic tissues were analyzed by cDNA microarray, with hierarchical clustering and multidimensional analysis.

Results: Five hundred and sixteen genes were differentially expressed of which SOS1, HDAC2, PLXNC1, GTSE1, ULK2, IRS2, ABCA12, TOP3A, HES1, and SRP68 genes were involved in 33 different pathways. The most frequently detected genes were: SOS1 in 20 different pathways; HDAC2 in 5 different pathways; IRS2 in 3 different pathways. There were 388 down-regulated genes. PLCB2 was involved in 11 different pathways, MDM2 in 9 pathways, FZD4 in 5 pathways, p15 and FGF12 in 4 pathways, POLE2 in 3 pathways, and MCM4 and POLR2E in 2 pathways. Thirty genes showed significant differences between transitional cell cancer (TCC) and squamous cell cancer (SCC) samples. Unsupervised cluster analysis of DNA microarray data revealed a clear distinction between low and high grade tumors. In addition 26 genes showed significant differences between low and high tumor stages, including fragile histidine triad, Ras and sialyltransferase 8 (alpha) and 16 showed significant differences between low and high tumor grades, like methionine adenosyl transferase II, beta.

Conclusions: The present study identified some genes, that can be used as molecular biomarkers or target genes in Egyptian bladder cancer patients.

Keywords: Human bladder cancer; Gene expression; cDNA microarray; Egypt.

1408. Circulating Levels of Adipocytokines as Potential Biomarkers for Early Detection of Colorectal Carcinoma in Egyptian Patients

Abdel-Rahman N Zekri, Yasser Mabrouk Bakr, Maali Mohamed Ezzat, Mohamed Serag Eldeen Zakaria and Tamer Mahmoud Elbaz

Background: Early detection of various kinds of cancers nowadays is needed including colorectal cancer due to the highly significant effects in improving cancer treatment. The aim of this study was to evaluate the potential value of adiponectin, visfatin and resistin as early biomarkers for colorectal cancer patients.

Materials and Methods: Serum levels of adiponectin, visfatin and resistin were measured by a sandwich-enzyme-linked (ELISA) assay technique in 114 serum samples comprising 34 patients with colorectal cancer (CRC), 27 with colonic polyps (CP), 24 with inflammatory bowel disease (IBD) and 29 healthy controls .The diagnostic accuracy of each serum marker was evaluated using receiver-operating characteristic (ROC) curve analysis.

Results: The mean concentration of adiponectin was significantly higher in CRC and CP groups than IBD and control groups (P-value <0.05). Also the mean concentration of serum resistin was significantly elevated in the IBD and control groups compared to CRC and CP groups (P-value = 0.014). However, no significant difference was noted in patients of the CRC and CP groups. On the other hand, the mean concentration of visfatin was significantly elevated in CRC and control groups compared to CP and IBD groups (P-value = 0.03). ROC analysis curves for the studied markers revealed that between CRC and IBD groups serum level of adiponectin had a sensitivity of 76.7% and a specificity of 76% at a cut off value of 3940, +LR being 3.2 and –LR 0.31 with AUC 0.852, while serum level of adiponectin between CP and IBD had a sensitivity of 77.8% and a specificity of 75% at a cut off value of 3300, with +LR=3.11 and -LR = 0.3 with AUC 0.852. On the other hand the serum level of visfatin between CRC and CP groups had a sensitivity of 65.5% and a specificity of 66.7 at a cut off value of 2.4, +LR being 1.67 and -LR 0.52 with AUC 0.698. Also the serum level of resistin had a sensitivity of 62.5% and a specificity of 70.3% at a cut off value of 24500, with +LR=2.1 and -LR = 0.53 with AUC 0.685 between control and other groups. On the other hand by comparing control vs CP groups resistin had a sensitivity of 81.8% and a specificity of 70.8% at a cut off value of 17700, with +LR=2.8 and -LR = 0.26 with AUC 0.763 while visfatin had a sensitivity of 68.2% and a specificity of 70.8% at a cut off value of 2.7, with +LR=2.34 and -LR = 0.0.45 with AUC 0.812.

Conclusions: These findings support potential roles of adiponectin, visfatin and resistin in early detection of CRC and discrimination of different groups of CRC, CP or IBD patients from normal healthy individuals.

Keywords: Colorectal carcinoma; Irritable bowel disease; Colonic polyps; Adiponectin; Visfatin; Resistin.

1409. Serum Biomarkers for Early Detection of Hepatocellular Carcinoma Associated with HCV Infection in Egyptian Patients

Abdel-Rahman Zekri, Amira Salah El-Din Youssef, Yasser Mabrouk Bakr, Reham Mohamed Gabr, Mahmoud Nour El-Din El-Rouby, Ibtisam Hammad, Entsar Abd El-Monaem Ahmed, Hanan Abd El-Haleem Marzouk, Mohammed Mahmoud Nabil, Hanan Abd El-Hafez Hamed, Yasser Hamada Ahmed, Aly Khaled S Zachariah and Gamal Esmat

Background: Early detection of hepatocellular carcinoma using serological markers with better sensitivity and specificity than alpha fetoprotein (AFP) is needed.

Aims: The aim of this study was to evaluate the diagnostic value of serum sICAM-1, β-catenin, IL-8, proteasome and sTNFR-II in early detection of HCC.

Materials and Methods: Serum levels of IL-8, sICAM-1, sTNFR-II, proteasome and β-catenin were measured by ELISA assay in 479 serum samples from 192 patients with HCC, 96 patients with liver cirrhosis (LC), 96 patients with chronic hepatitis C (CHC) and 95 healthy controls.

Results: Serum levels of proteasome, sICAM-1, β-catenin and aFP were significantly elevated in HCC group compared to other groups (P-value<0.001), where serum level of IL-8 was significantly elevated in the LC and HCC groups compared to CHC and control groups (P-value <0.001), while no significant

difference was noticed in patients with HCC and LC (P-value=0.09). Serum level of sTNFRII was significantly elevated in patients with LC compared to HCC, CHC and control groups (P-value <0.001); also it was significantly higher in HCC compared to CHC and control groups (P-value <0.001). ROC curve analysis of the studied markers between HCC and other groups revealed that the serum level of proteasome had sensitivity of 75.9% and specificity of 73.4% at a cut-off value of 0.32 µg/ml with AUC 0.803 sICAM-1 at cut off value of 778ng/ml, the sensitivity was 75.8% and the specificity was 71.8% with AUC 0.776. β-catenin had sensitivity and specificity of 70% and 68.6% respectively at a cut off value of 8.75ng/ml with an AUC of 0.729. sTNFR-II showed sensitivity of 86.3% and specificity of 51.8% at a cut off value of 6239.5pg/ml with an AUC of 0.722. IL-8 had sensitivity of 70.4% and specificity of 52.3% at a cut off value of 51.5pg/ml with AUC 0.631.

Conclusions: Our data supported the role of proteasome, sICAM-1, sTNFR-II and β-catenin in early detection of HCC. Also, using this panel of serological markers in combination with aFP may offer improved diagnostic performance over aFP alone in the early detection of HCC.

Keywords: Hepatocellular carcinoma; αFP; sICAM-1; Proteasome; β-Catenin; Il-8 - Stnfr-II.

1410. Anti-proliferative Activities of Metallic Nanoparticles in an in Vitro Breast Cancer Model

Loutfy SA, Al-Ansary NA, Abdel-Ghani NT, Hamed AR, Mohamed MB, Craik JD, Eldin TA, Abdellah AM, Hussein Y, Hasanin MT and Elbehairi SE.

To investigate effect of metallic nanoparticles, silver (AgNPs) and gold nanoparticles (AuNPs) as antitumor treatment in vitro against human breast cancer cells (MCF-7) and their associated mechanisms. This could provide new class of engineered nanoparticles with desired physicochemical properties and may present newer approaches for therapeutic modalities to breast cancer in women.

Materials and Methods: A human breast cancer cell line (MCF-7) was used as a model of cells. Metallic nanoparticles were characterized using UV-visible spectra and transmission electron microscopy (TEM). Cytotoxic effects of metallic nanoparticles on MCF-7 cells were followed by colorimetric SRB cell viability assays, microscopy, and cellular uptake. Nature of cell death was further investigated by DNA analysis and flow cytometry.

Results: Treatment of MCF-7 with different concentrations of 5-10nm diameter of AgNPs inhibited cell viability in a dose-dependent manner, with IC50 value of 6.28µM, whereas treatment of MCF-7 with different concentrations of 13-15nm diameter of AuNPs inhibited cell viability in a dose-dependent manner, with IC50 value of 14.48µM. Treatment of cells with a IC50 concentration of AgNPs generated progressive accumulation of cells in the S phase of the cell cycle and prevented entry into the M phase. The treatment of cells with IC50 concentrations of AuNPs similarly generated progressive accumulation of cells in sub-G1 and S phase, and inhibited the entrance of cells into the M phase of the cell cycle. DNA fragmentation, as demonstrated by electrophoresis, indicated induction of apoptosis.

Conclusions: Our engineered silver nanoparticles effectively inhibit the proliferation of human breast carcinoma cell line MCF-7 in vitro at high concentration (1000 µM) through

apoptotic mechanisms, and may be a beneficial agent against human carcinoma but further detailed study is still neede.

Keywords: Metallic nanoparticles; Anti-proliferative activity; Breast cancer cell line; Cytotoxicity.

1411. Dorzolamide Synergizes the Antitumor Activity of Mitomycin C Against Ehrlich'S Carcinoma Grown in Mice: Role of Thioredoxin-Interacting Protein

Belal M. Ali, Sawsan A. Zaitone, Samia A. Shouman and Yasser M. Moustafa

The antitumor activity of carbonic anhydrase (CA) inhibitors is attributed to their ability to induce a state of intracellular acidification. In fact, acidic intracellular pH was demonstrated to upregulate several tumor suppressor proteins and increase the activity of many chemotherapies. The present study aimed to investigate the antitumor activity of the CA inhibitor, dorzolamide, in combination with mitomycin C and to study the effect of these drugs on tumoral thioredoxininteracting protein (TXNIP) as well as tumor cell proliferation and apoptosis. Solid tumors were induced by subcutaneous inoculation of Ehrlich's ascites carcinoma (EAC) cells in female mice. Mice were treated with dorzolamide (3, 10, or 30 mg/kg/day, i.p.) and/or mitomycin C (1 mg/kg, i.p.) weekly for 3 weeks. Treatment with mitomycin C increased TXNIP level in EAC solid tumors in mice. Likewise, treatment with dorzolamide upregulated TXNIP and p53 while downregulated bcl-2. Both drug therapies increased tumoral caspase 9, caspase 3, and PARP-1 cleavage in addition to decreasing the proliferative Ki-67-stained nuclear fraction. Indeed, a synergistic effect was detected between mitomycin C and dorzolamide. The current data demonstrated that the antitumor activity of mitomycin C and dorzolamide was, at least in part, mediated through stimulating tumoral expression of TXNIP and enhancing tumor apoptosis.

Keywords: Anticancer; Carbonic anhydrase; Dorzolamide; Ehrlich'S ascites carcinoma; Mitomycin C; Txnip.

1412. Modulation of Imatinib Cytotoxicity by Selenite in HCT116 Colorectal Cancer Cells

Amal Kamal Abdel-Aziz, Samar Saad Eldeen Azab, Samar Samir Youssef, Abeer Mostafa El-Sayed, Ebtehal El-Demerdash and Samia Shouman

Imatinib is a principal therapeutic agent for targeting colorectal tumours. However, mono-targeting by imatinib does not always achieve complete cancer eradication. Selenite, a well-known chemopreventive agent, is commonly used in cancer patients. In this study, we aimed to explore whether selenite can modulate imatinib cytotoxicity in colorectal cancer cells. HCT116 cells were treated with different concentrations of imatinib and/or selenite for 24, 48 and 72 hr. Imatinib-selenite interaction was analysed using isobologram equation. As indicators of apoptosis, DNA fragmentation, caspase-3 activity, Bcl-2 expression were explored. Autophagic machinery was also checked by visualizing acidic vesicular organelles and measuring Beclin-1 expression. Furthermore, reactive oxygen and nitrogen species were also examined. This study demonstrated that selenite synergistically

augmented imatinib cytotoxicity in HCT116 cells as demonstrated by combination and dose reduction indices. Supranutritional dose of selenite when combined with imatinib induced apoptotic machinery by decreasing Bcl-2 expression, increasing caspase-3 activity and subsequently fragmenting DNA and blunted cytoprotective autophagy by decreasing Beclin-1 expression and autophagosomes formation. Moreover, their combination induced cell cycle S-phase block, increased total thiol content and reduced nitric oxide levels. In conclusion, selenite synergizes imatinib cytotoxicity through multi-barrelled molecular targeting, providing a novel therapeutic approach for colorectal cancer.

Keywords: Imatinib; Cytotoxicity; Selenite; HCT116 colorectal cancer cells.

1413. Significance of Serum Levels of Vitamin D and Some Related Minerals in Breast Cancer Patients

Iman A Abdelgawad, Rawya H El-Mously, Magdy M Saber, Ossama A Mansour and Samia A Shouman

Vitamin D and calcium are involved in a wide range of proliferation, apoptosis and cell signaling activities in the body. Suboptimal concentrations may lead to cancer development. The role of phosphate in cancer metabolism is particularly relevant in breast cancer while, magnesium deficiency favors DNA mutations leading to carcinogenesis.

Objectives: To determine serum levels of vitamin D, calcium, phosphorus, magnesium, and parathormone in female breast cancer patients and to assess their association with some prognostic factors in breast cancer. Design and methods: This study is done on 98 newly diagnosed female breast cancer patients and 49 age matched apparently healthy female volunteers as controls. Serum samples from all patients and controls were subjected to 25-OH Vit D, calcium, phosphorus, magnesium, and parathormone measurements.

Results: In the breast cancer group, the median serum levels of 25-OH Vit D were 15 ng/ml, while it was 21 ng/ml in the control group. Levels of 25-OH Vit D and other tested minerals were significantly lower while calcium: magnesium (Ca:Mg) ratio, and calcium : phosphorus (Ca:P) ratio were significantly higher in the breast cancer group. Significant negative correlation was detected between phosphorus and calcium, ionized calcium , calcium magnesium ratio, and calcium phosphorus ratio.

Conclusion: It is not only the deficient levels of Vit D and other related minerals, but the combination of the abnormal levels of all the studied parameters that might contribute to the development of cancer. Further studies with larger number of patient are needed.

Keywords: Vitamin D; Calcium; Phosphorus; Magnesium; Breast cancer.

1414. Role of ZnS Shell on Stability, Cytotoxicity, and Photocytotoxicity of Water-Soluble CdSe Semiconductor Quantum dots Surface Modified with Glutathione

Salwa Ali Ibrahim, Wafaa Ahmed and Tareq Youssefa

The present study examines the stability and cytotoxicity of two quantum dots (QDs) systems in cell culture medium in the presence and absence of a thin layer of a ZnS shell. The two systems were built from a core, CdSe, and surface modified with glutathione (GSH), named CdSe ~ GSH and CdSe/ZnS ~ GSH.

CdSe/ZnS ~ GSH QDs exhibited a high photostability with a pronounced enhancement in photoluminescence in cell culture medium. Both systems showed insignificant reduction in cell viability of HFB-4 and MCF-7 cell lines in the dark. Following 60 min of low laser power exposure (irradiance of 10 mWcm–^{2}),

CdSe~GSH QDsCdSe~GSH QDs showed a remarkable decrease in cell viability, which may result from the detachment of GSH molecules, whereas CdSe/ZnS~GSHCdSe/ZnS~GSH QDs showed an insignificant decrease either immediately after irradiation or even 2 h post-exposure, which can be attributed to the high affinity between ZnS and GSH coatings. This study demonstrated that a thin layer of ZnS shell played a crucial role in the stability of CdSe/ZnS~GSHCdSe/ZnS~GSH QDs in cell culture medium with an improvement in luminescence efficiency, whereas surface modification with GSH molecules in the presence of ZnS showed no significant cytotoxic effects before or after photoirradiation, which makes this system attractive for several biomedical applications.

Keywords: Quantum dots; Glutathione; Stability; Cytotoxicity; Photocytotoxicity; Laser.

1415. Chemopreventive and Therapeutic Potentials of Thymoquinone in HepG2 Cells: Mechanistic Perspectives

Abeer ElKhoely, Hafez F. Hafez, Abeer M. Ashmawy,Osama Badary, Ahmed Abdelaziz, Adel Mostafa and Samia A. Shouman

Liver cancer is the fifth commonest malignancy worldwide and the third leading cause of death. Identifying novel curative and preventive therapy may improve its prognosis. In this study, thymoquinone (TQ), the most active biological ingredient of Nigella sativa Linn, was investigated for its antitumor activity. Mechanistic perspectives underlying this antitumor activity were explored by testing its effect on cell cycle, apoptosis, and angiogenesis. In addition, the chemopreventive effect of TQ was carried out by measuring its effect on phase I CYP1A1 and phase II glutathione S-transferase (GST) drug-metabolizing enzymes. The results of the present study revealed the effectiveness of TQ as an antitumor agent against different types of cancer including brain, colon, cervix and liver at both a time- and concentration-dependent manner. In HepG2 cells, it induced G2/M phase cell cycle arrest and a concentration-dependent increase in the percentage of apoptotic cells with an increase in the ratio of Bax/BCL-2. Moreover, the expression of mRNA and protein level of vascular endothelial growth factor decreased as the concentration of TQ increased. Our data showed a significant inhibition of induced phase I CYP1A1 enzyme, and elevation in the content of glutathione and activity of phase II enzyme GST, in HepG2 cells. Our results provide support for the beneficial use of TQ as a therapeutic and chemopreventive agent against liver cancer.

Keywords: Thymoquinone; Antitumor; Chemopreventive; HepG2; Apoptosis; Cell cycle.

1416. Investigating the Pretreatment miRNA Expression Patterns of Advanced Hepatocellular Carcinoma Patients in Association with Response to TACE Treatment

Medhat S. El-Halawany, Heba M. Ismail, Ahmed A. Zeeneldin, Ammar Elfiky, Marwa Tantawy, Mohamed H. Kobaisi, Ikram Hamed and Abdel Hady A. AbdelWahab

Hepatocellular carcinoma (HCC) is a lethal malignancy with poor prognosis and limited treatment options. Transarterial chemoembolization (TACE) using chemotherapy agents—doxorubicin and cisplatin—is an accepted treatment option for locally advanced hepatocellular carcinoma. In the current study, we analyzed the expression pattern of a selected panel of 94 miRNAs in archival samples that were collected prior to treatment from 15 Egyptian patients diagnosed with advanced hepatocelleular carcinoma. We observed an overall increase in miRNA expression in HCC samples compared with normal subjects. Out of 94 examined miRNAs, 53 were significantly upregulated while 3 miRNAs were downregulated in HCC samples compared to normal liver samples. Comparing the pretreatment miRNA expression profiles in HCC patients and the patients response to TACE treatment resulted in the identification of a set of 12 miRNAs that are significantly upregulated in nonresponders group. This miRNA panel includes miR-10a-1, miR-23a-1, miR-24, miR-26a, miR-27a, miR-30c, miR-30e, miR-106b, miR-133b, miR-199a, miR-199-3p, and miR-200b. Furthermore, we observed that a panel of 10 miRNAs was significantly associated with patients' survival status at 1 year. These results highlight the potential implications of pretreatment miRNAs expression profiling in prediction of the patients' response to TACE treatment in liver cancer.

1417. Transforming Growth Factor-β, Insulin-Like Growth Factor I/Insulin-Like Growth Factor I Receptor and Vascular Endothelial Growth Factor-A: Prognostic and Predictive Markers in Triple-Negative and Non-Triple-Negative Breast Cancer

Abeer Bahhnassy, Marwa Mohanad, Sabry Shaarawy, Manal F. Ismail, Ahmed El‑Bastawisy, Abeer M. Ashmawy and Abdel‑Rahman Zekri

In the current study, the prognostic and predictive values of serum transforming growth factor-β1 (TGF-β1), insulin-like growth factor I (IGF-I)/IGF-I receptor (IGF-IR) and vascular endothelial growth factor-A (VEGF-A) were evaluated in triple-negative and non-triple-negative breast cancer (TNBC and non-TNBC). The aim was to identify a group of serological biomarkers and to identify possible candidates for targeted therapy in patients with TNBC and non-TNBC. Protein levels of TGF- β1, IGF-I/IGF-IR and VEGF-A in the serum were measured in 43 TNBC, 53 non-TNBC and 20 normal control participants using quantitative ELISA assays.

Results were correlated against standard prognostic factors, response to treatment and survival. TNBC was identified to be associated with poor prognosis and serum levels of VEGF-A and

IGF/IGF-IR were significantly higher in the TNBC group compared with the non-TNBC group. IGF-IR and VEGF-A overexpression was observed to be correlated with TGF-β1 expression and all of the markers investigated were associated with metastasis and disease progression. In the multivariate analysis, VEGF-A, IGF-I and IGF-IR were observed to be independent predictors for overall survival, whereas TGF-β1 and lymph node status were identified as independent predictors for disease-free survival. The overall response rate was significantly lower in patients with TNBC and those with high levels of TGF-β1, IGF-I/IGF-IR and VEGF-A. In view of the present results, it was concluded that TGF- β1, IGF-I/IGF-IR and VEGF-A overexpression is associated with the presence of aggressive tumors, which exhibit an increased probability of metastasis, a poor response to treatment and reduced survival rate. This indicates that VEGF-A, IGF-IR and IGF-I have the potential to be used as surrogate biomarkers and are promising candidates for targeted therapy, particularly in patients with TNBC.

Keywords: Triple‑negative breast cancer; Transforming growth factor‑β; Insulin growth factor/insulin growth factor receptor I; Vascular endothelial growth factor; Prognosis.

1418. Evaluation of Cytotoxic Effect of Metallic Nanoparticles in an in Vitro Liver Cancer Model

Samah A. Loutfy, Rokaya H. Shalaby, Ahmed Ragab Hamed, Mona B. Mohamed, Ahmed Barakat and Zeinab F. Abdullah

We aim to evaluate cytotoxic effect of silver and gold metallic nanoparticles (AgNPs & AuNPs) on human cucasian hepatocellular carcinoma cell line model (HepG2) and their possible anti-proliferative activity. This new class of engineered nanoparticles with desired physicochemical properties can be applied as new therapeutic approaches against human liver cancer disease. HepG2 was used as a model of human liver cancer cells. Metallic nanoparticles were characterized using UV-visible spectra and transmission electron microscopy (TEM). Cytotoxic effects of metallic nanoparticles on HepG2 cells were followed by colorimetric neutral red and SRB cell viability assays. Further investigation of cytotoxic effect of our nanomaterials were further investigated on a cellular and molecular level using cell cycle analysis , DNA and some apoptotic genes expression on a level of mRNA for P53, Bak, Bax, BCl2 and actin was served as housekeeping gene. Treatment of HepG2 with different concentrations of 22 nm diameter of AgNPs did not show alteration of cell morphology after 24 h of cell exposure. Also, when cells were treated with high concentration of AgNPs (viability was 78% after cell treatment with 10 µM and decreased to 46% after treatment of cells with 1000 µM). Cellular evaluation of AgNPs revealed progressive accumulation in the S phase of the cell cycle correlating with decreased number of cells in the G2/M phase followed by cellular DNA fragmentation. Extensive evaluation of cytotoxic effect of AgNPs showed mRNA apoptotic genes expression (P53, Bak, Bax, BCl2) without expression of mRNA of caspase 3 gene which was expressed in untreated cells, suggesting involvement of intrinsic apoptotic caspase independent pathway. Treatment of HepG-2 with different concentrations of 34 nm diameter of AuNPs did not show alteration of cell morphology after 24 h of cell exposure. Such metallic nanoparticles did not reveal toxic effect at

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concentration up to 50 µM after 48 h of cell exposure. Cellular evaluation of AuNPs revealed progressive accumulation at G0/G1and at G2/M phases of cell cycle. Also the same results were obtained by treating cells with AgNPs, where the expression of mRNA of P53, Bak, Bax, BCl2 without expression of mRNA of caspase 3 gene was observed in treated cells, suggesting intrinsic apoptotic caspase independent mechanism but may be induced by different molecules than that exerted by AgNPs. Our engineered silver nanoparticles at size of 22nm revealed genotoxic effect on human liver carcinoma cell line HepG-2 through intrinsic apoptotic caspase independent mechanisms. Further quantitative analysis and investigation of impact of time on genotoxic effect are required before reaching a final conclusion and starting in vivo assays.

Keywords: Metallic nanoparticles; Anti-proliferative activity; Hep12, Apoptotic Genes Expression.

Dept. of Tumor Pathology

1419. The Role of Interleukin-8 (IL-8) and IL-8 Receptors in Platinum Response in High Grade Serous Ovarian Carcinoma

Euan A. Stronach, Paula Cunnea,Christina Turner, Tankut Guney, Radhika Aiyappa, Senthuran Jeyapalan, Camila H. de Sousa, Alacoque Browne, Nesreen Magdy, James B. Studd, Ruethairat Sriraksa, Hani Gabra and Mona El-Bahrawy

Platinum based drugs are the cornerstone of chemotherapy for ovarian cancer, however the development of chemoresistance hinders its success. IL-8 is involved in regulating several pro-survival pathways in cancer. We studied the expression of IL-8 and IL-8 receptors in platinum sensitive and resistant cell lines. Using qRT-PCR and immunohistochemistry, both platinum sensitive (PEA1, PEO14) and resistant (PEA2, PEO23) show increased expression of IL-8 and IL-8 receptors. IL-8RA shows nuclear and cytoplasmic expression, whilst IL-8RB is present solely in the cytoplasm. Knockdown of IL-8 increased sensitivity to cisplatin in platinum sensitive and reversed platinum resistance in resistant cell lines, decreased the expression of anti-apoptotic Bcl-2 and decreased inhibitory phosphorylation of pro-apoptotic Bad. IL-8 receptor antagonist treatment also enhanced platinum sensitivity. Nuclear localisation of IL-8RA was only detected in platinum resistant tumours. Inhibition of IL-8 signalling can enhance response in platinum sensitive and resistant disease. Nuclear IL-8RA may have potential as a biomarker of resistant disease.

Keywords: Carcinoma; Chemoresistance; Cytokine; Interleukin-8; Ovary.

Faculty of Physical Therapy

Dept. of Physical Therapy for Neuromuscular Disorder

1420. Effect of A Hybrid Maneuver in Treating Posterior Canal Benign Paroxysmal Positional Vertigo

Wanees M. A. Badawy, Ebtessam K. Gad El-Mawla, Ahmed E. F. Chedid and Ahmed H. A. Mustafa

Background: Benign paroxysmal positional vertigo (BPPV) is the most common disorder of the vestibular system of the inner ear, which is a vital part of maintaining balance. Although the efficacy of the Epley maneuver—also known as the canalith repositioning maneuver (CRM)—is well established, data comparing CRM versus a hybrid treatment are lacking.

Purpose: The purpose of this study was to determine the effect of a hybrid treatment, the Gans repositioning maneuver (GRM) either with or without postmaneuver restrictions, compared with CRM on treatment of posterior canal BPPV (PC-BPPV).

Research Design: Study design was a randomized controlled trial.

Study Sample: A total of 45 patients (30 males and 15 females) with unilateral PC-BPPV were randomly allocated to one of three equal groups on the basis of the date of the first visit with matched assignment for gender: a GRMR group (GRM with postmaneuver restrictions), a GRM group, and a CRM group.

Intervention: Patients received weekly administration of the maneuver until resolution of symptoms. The Dix-Hallpike test was performed before treatment at every appointment, and finally after 1 mo from the last maneuver.

Data Collection and Analysis: Nystagmus duration and vertigo intensity were recorded. The supine roll test was performed in case the Dix-Hallpike test was negative to test otoconial migration. Data were analyzed with repeated-measures analysis of variance, paired t-tests with a Bonferroni correction, and the Spearman rank correlation coefficient.

Results: All patients showed improvement within the groups, and PC-BPPV symptoms were resolved by an average of 2, 1.7, and 1.6 maneuvers for GRMR, GRM, and CRM, respectively, with no statistical differences among the three groups (p >0.05). Only two patients had recurrence, and one patient had horizontal BPPV at 1 mo follow-up.

Conclusion:We demonstrated that theGRMas a new treatment is effective in treating PC-BPPV with no benefits to postmaneuver restrictions.

Keywords: Benign paroxysmal positional vertigo; Canalith repositioning maneuver; Nystagmus; Vertigo.

1421. The Influence of Physical Therapy on Oropharyngeal Dysphagia in Acute Stroke Patients

Mohamed S. El-Tamawy, Moshera H. Darwish, Hatem S. El-Azizi, Ahmed M. Abdelalim and Shereen I. Taha

Background Dysphagia occurs in 65% of acute stroke patients, resulting in airway obstruction, malnutrition, and chest infection. Objective The aim of this study was to evaluate the effect of a

designed physical therapy program that consists of therapeutic physical exercises in addition to neuromuscular electrical stimulation on severe swallowing disorders (oropharyngeal dysphagia) in acute ischemic cerebrovascular stroke patients.

Methods Thirty stroke patients suffering from severe dysphagia were assigned randomly to two equal groups: the study group (G1) and the control group (G2). The patients in the study group (G1) received medical treatment in addition to a designed physical therapy program mainly directed at strengthening and stimulating the elevator muscles of the larynx above and below the hyoid bone, whereas the patients in the control group (G2) were under medical treatment only. Digital fl uoroscopy was used to assess the following variables: oral transit time, laryngeal elevation, hyoid elevation, esophageal sphincter opening, and aspiration or penetration. Assessment was carried out before and at the end of treatment after 6 weeks.

Results Before treatment, there were no signifi cant differences in different variables between G1 and G2. After treatment there was signifi cant improvement in all variables in G1 compared with G2, as measured by digital fl uoroscopy.

Conclusion The suggested physical therapy program could be an effective and safe method for improving and restoring the normal swallowing mechanism in ischemic stroke patients suffering from severe dysphagia.

Keywords: Digital fluoroscopy; Dysphagia; Electrical stimulation; Ischemic stroke; Physical rehabilitation.

Dept. of Physical Therapy for Basic Science

1422. The Addition of Upper Cervical Manipulative Therapy in the Treatment of Patients with Fibromyalgia: A Randomized Controlled Trial

Ibrahim M. Moustafa and Aliaa A. Diab

Rheumatology International, 35: 1163-1174 (2015) IF: 1.516

The aim of this study was to investigate the immediate and long-term effects of a one-year multimodal program, with the addition of upper cervical manipulative therapy, on fibromyalgia management outcomes in addition to three-dimensional (3D) postural measures. This randomized clinical trial with one-year follow-up was completed at the research laboratory of our university. A total of 120 (52 female) patients with fibromyalgia syndrome (FMS) and definite C1-2 joint dysfunction were randomly assigned to the control or an experimental group. Both groups received a multimodal program; additionally, the experimental group received upper cervical manipulative therapy. Primary outcomes were the Fibromyalgia Impact Questionnaire (FIQ), whereas secondary outcomes included Pain Catastrophizing Scale (PCS), algometric score, Pittsburgh Sleep Quality Index (PSQI), Beck Anxiety Inventory (BAI), Beck Depression Inventory (BDI), and 3D postural measures. Measures were assessed at three time intervals: baseline, 12 weeks, and 1 year after the 12-week follow-up. The general linear model with repeated measures indicated a significant group × time effect in favor of the experimental group on the measures of 3D postural parameters (P < .0005), FIQ (P < .0005), PCS (P < .0005), algometric score (F = P < .0005), PSQI (P < .0005), BAI (P < .0005), and BDI (P < .0005). The addition of the upper cervical manipulative therapy to a multimodal program is beneficial in treating patients with FMS.

Keywords: Fibromyalgia; Randomized controlled trial; Cervical; Manipulation.

1423. The Effect of Adding Forward Head Posture Corrective Exercises in the Management of Lumbosacral Radiculopathy: A Randomized Controlled Study

Ibrahim M. Moustafa and Aliaa A. Diab

Journal of Manipulative and Physiological Therapeutics, 38: (2015) IF: 1.48

Objective: The purpose of this study was to determine the immediate and long-term effects of a multimodal program, with the addition of forwardhead posture correction, in patients with chronic discogenic lumbosacral radiculopathy.

Methods: This randomized clinical study included 154 adult patients (54 females) who experienced chronic discogenic lumbosacral radiculopathyand had forward head posture. One group received a functional restoration program, and the experimental group received forward head posturecorrective exercises. Primary outcomes were the Oswestry Disability Index (ODI). Secondary outcomes included the anterior head translation, lumbar lordosis, thoracic kyphosis, trunk inclination, lateral deviation, trunk imbalance, surface rotation, pelvic inclination, leg and back pain scores, and H-reflex latency and amplitude. Patients were assessed at 3 intervals (pretreatment, 10-week posttreatment, and 2-year follow-up).

Results: A general linear model with repeated measures indicated a significant group × time effect in favor of the experimental group on the measures of ODI (F = 89.7; P < .0005), anterior head translation (F = 23.6; P < .0005), H-reflex amplitude (F = 151.4; P < .0005), H-reflex latency (F = 99.2; P < .0005), back pain (F = 140.8; P < .0005), and leg pain (F = 72; P < .0005). After 10 weeks, the results revealed an insignificant difference between the groups for ODI (P = .08), back pain (P = .29), leg pain (P = .019), H-reflex amplitude (P = .09), and H-reflex latency (P = .098). At the 2-year follow-up, there were significant differences between the groups for all variables adopted for this study (P < .05).

Conclusions: The addition of forward head posture correction to a functional restoration program seemed to positively affect disability, 3-dimensional spinal posture parameters, back and leg pain, and S1 nerve root function of patients with chronic discogenic lumbosacral radiculopathy.

Keywords: Head; Low back pain; Posture; Radiculopathy; Randomized controlled trial.

Dept. of Physical Therapy for Cardio Vascular, Respiratory Disorders and Geriatrics

1424. Aerobic Exercise Training in Modulation of Aerobic Physical Fitness and Balance of Burned Patients

Zizi M. Ibrahim Ali, Basant H. El-Refay and Rania Reffat Ali

Journal of Physical Therapy Sceince, 27: 585-589 (2015) IF: 0.392

Purpose This study aimed to determine the impact of aerobic exercise on aerobic capacity, balance, and treadmill time in patients with thermal burn injury.

Subjects and Methods Burned adult patients, aged 20–40 years (n=30), from both sexes, with second degree thermal burn injuries covering 20–40% of the total body surface area (TBSA), were

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enrolled in this trial for 3 months. Patients were randomly divided into; group A (n=15), which performed an aerobic exercise program 3 days/week for 60 min and participated in a traditional physical therapy program, and group B (n=15), which only participated in a traditional exercise program 3 days/week. Maximal aerobic capacity, treadmill time, and Berg balance scale were measured before and after the study.

Results In both groups, the results revealed significant improvements after treatment in all measurements; however, the improvement in group A was superior to that in group B.

Conclusion The results provide evidence that aerobic exercises for adults with healed burn injuries improve aerobic physical fitness and balance.

Keywords: Aerobic exercise; Aerobic physical fitness; Burn injury.

Dept. of Physical Therapy for Growth and Developmental Disorder

1425. LASER Versus Electromagnetic Field in Treatment of Hemarthrosis in Children with Hemophilia

Mohamed A. Eid and Sobhy M. Aly

Children with hemophilia usually have recurrent joint bleeding that leads to joint damage, loss of range of motion, and restriction of mobility, therefore affecting the quality of life in these children. The purpose of this study was to compare the effects of low-level laser therapy (LLLT) to that of pulsed electromagnetic field (PEMF) in treatment of hemarthrosis in children with hemophilia. Thirty boys with hemophilia A with ages ranging from 9 to 13 years were selected and assigned randomly, using sealed envelopes, into two equal intervention groups. The study group I received the traditional physical therapy program in addition to LLLT, whereas the study group II received the same physical therapy program given to the study group I in addition to PEMF. Both groups received the treatment sessions three times per week for three successive months. Pain, laboratory investigations, swelling, and range of motion (ROM) of the affected knee joint, in addition to physical fitness were evaluated before, at the end of the sixth week and at 12 weeks of the treatment program. Laser group showed significant improvement in all measured variables after the sixth week of treatment when compared with PEMF. By 12 weeks of treatment, there was a significant improvement in pain, ROM, ESR and leucocytes levels in laser group compared with PEMF, while there was no significant difference in knee circumferences and the 6-min walk test (6MWT) between both groups. Both groups showed significant improvement at 12 weeks of treatment compared with that at 6 weeks. Both LLLT and PEMF are effective modalities in reducing pain, swelling, increasing ROM and improving physical fitness. Twelve weeks of treatment of both modalities demonstrated significant improvement than 6 weeks of treatment. Laser therapy induced significant improvement than electromagnetic therapy in treatment of hemarthrosis-related problems in children with hemophilia.

Keywords: Laser; Electromagnetic field; Hemarthrosis; Hemophilia.

1426. Effect of Whole Body Vibration Training on Standing Balance and Muscle Strength in Children with Down Syndrome

Mohamed Ahmed Eid

Objective: The purpose of this study was to determine whether whole-body vibration training could improve standing balance and muscle strength in children with Down syndrome.

Design: This study was a randomized controlled trial studying 30 children (8-10 yrs old) with Down syndrome. They were assigned randomly using sealed envelopes, with 15 children allocated to the control group (9 boys, 6 girls) and another 15 children allocated to the study group (8 boys, 7 girls). The control group received a designed physical therapy program, whereas the study group received the same program given to the control group in addition to whole-body vibration training. Both groups received the treatment sessions three times per week for 6 successive months. Measurement of stability indices by using the Biodex Stability System as well as muscle strength of the knee flexors and extensors by using a handheld dynamometer was done before and after the 6 mos of the treatment program.

Results: Each group demonstrated significant improvements in stability indices and muscle strength after treatment (P < 0.05), with significantly greater improvements seen in the study group when compared with the control group (P < 0.05).

Conclusions: Whole-body vibration may be a useful intervention modality to improve balance and muscle strength in children with Down syndrome.

Keywords: Down syndrome; Balance; Biodex stability system; Muscle strength; Whole body vibration.

Dept. of Physical Therapy for Gynecology and Obstetrics

1427. Effect of Laser Acupuncture Combined with A Diet-Exercise Intervention on Metabolic Syndrome in Post-menopausal Women

Hanan S. El-Mekawy, Abeer M. El Deeb and Hassan O. Ghareib

This study aimed to evaluate the effect of laser acupuncture combined with a diet-exercise intervention on features of the metabolic syndrome (MetS). Twenty-eight obese post-menopausal women were randomly distributed to the control and laser acupuncture group. The control group received the diet-exercise intervention and the study group received the same intervention and sessions of laser acupuncture, 3 times/week for 12 weeks. Anthropometric measurement, fasting blood glucose and insulin levels, homeostatic model assessment-insulin resistance (HOMA-IR), and lipid profile were assessed before and after the treatment course. Both groups showed a significant decrease in the anthropometric and metabolic parameters. However, laser acupuncture group showed a greater decrease in the waist (P = 0.001) and hip (P = 0.001) circumferences, cholesterol (P = 0.04), and insulin levels (P = 0.043) than the control group. These results suggest that laser acupuncture is a valuable approach that could be added to the diet-exercise intervention to correct features of the MetS.

Keywords: Metabolic syndrome; Laser acupuncture; Obesity; Post-menopause.

1428. Long-term Effect of Pulsed High-intensity Laser Therapy in the Treatment of Post-mastectomy Pain Syndrome: A Double Blind, Placebo-control, Randomized Study

Anwar Abdelgayed Ebid and Ahmed Mohamed El-Sodany

We assess the long-term effect of pulsed highintensity laser therapy (HILT) in the treatment of the postmastectomy pain syndrome (PMPS). A total of 61 women participated in this study (30 in the laser group and 31 in the placebo laser group), with a mean age of 53.56±1.11 years. Patients who were randomly assigned to the laser group received HILT three times per week for 4 weeks, plus a routine physical therapy program (RPTP). The placebo laser group received placebo HILT plus RPTP. The outcomes measured were pain level by visual analog scale (VAS), shoulder range of motion (ROM), and quality of life (QOL). Statistical analysis was performed by ANOVA with repeated measures to compare the differences between baseline and post-treatment measurements and after 12 weeks of follow-up for both groups. The level of statistical significance was set at P<0.05. Shoulder ROM significantly increased in the laser group after 4 weeks of treatment and after 12 weeks of follow-up compared with the placebo group. VAS results showed a significant decrease post-treatment in the laser group relative to the placebo group, and QOL results showed a significant improvement in the laser group compared with the placebo group and still improved after 12 weeks of follow-up. HILT combined with an RPTP appears to be more effective in patients with PMPS than a placebo laser procedure with RPTP

Keywords: PMPS; HILT; Pain; Shoulder ROM; QOL.

1429. Norms for Hand Grip Strength in Children Aged 6–12 Years in Saudi Arabia

Mohammed Taher Ahmed Omar, Ahmad Alghadir and Shaheerah Al Baker

Objectives: There were two main objectives of this study: to establish normative values of hand grip strengths for 6–12-year-old children in Saudi Arabia and to compare results with existing Western data.
Methods: Five-hundred twenty-five children from the central area of Riyadh, Saudi Arabia, were recruited. Hand grip strength was measured using a standard adjustable electronic hand dynamometer.
Results: The grip strength increased with advancing age in both genders,but grip strength for boys was significantly stronger than that of girls. There was no significant difference in hand grip strength according to the type of hand dominance. The hand strength of the Saudi children appeared to be lower than that of Western children.
Conclusion: The reported values of hand grip strength will allow therapists to compare scores from typical and atypical children according to the age, gender, and body measures
Keywords: Children; Hand grip strength; Norms.

Faculty of Nursing

Dept. of Mental Health Nursing

1430. Conflict Resolution Behaviors Among Addict Adolescents in Egypt

Samah Osman Ali, Zeinab A. Halim Osman, Enayat A. Wahab and Noha Ahmed Sabry

Conflict resolution behaviors are essential to solve the problems raised by conflict and to overcome the negative impacts of it. Addict adolescents can get more advantage, if they know how to handle conflict in a proper way. This study aimed to assess Conflict resolution behaviors among addict adolescent in Egypt. A descriptive design was utilized in the current study. A Sample of convenience of 150 addicts adolescents who were attending to the outpatient clinic in Kasr Al Ain psychiatric and addiction hospital. Two tools were utilized in the current study including Sociodemographic characteristics and medical data, conflict resolution behaviors questioner developed by the investigator. The result showed that, more than half of the studied addict adolescents were males. More than three quarter of the studied addict adolescents were aged between 17 -19 .the majority of the studied addict adolescents were read and write and secondary education. The majority of the studied addict adolescent abused tramadol. The Findings also revealed that, slightly more than three quarter of the studied addict adolescent sometimes and always use competitive behavior, smoothing behavior, and avoidance behavior in resolving their conflict. And the minority of the studied addicts adolescents sometimes and always used compromising and problem solving behavior in resolving their conflicts. The finding highlights the importance of further studies about conflict resolution behaviours among addict adolescents in large sample and from different areas and the essential to educate the public that teen substance use is a public health problem.This study supports a role for conflict resolution styles in studies of adolescents problem behavior.

Keywords: Conflict; Conflict resolution behaviors; Addict adolescent.

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4-2 Faculty of Commerce

Faculty of Economics and Political Science

Dept. of Economics

1431. The Causal Chain of Market Based Reform in Egyptian Voice Telecommunication

Amirah El-Haddad

Utility reform swept the developing world in the 1980s and 1990s. This case study of the Egyptian telecoms sector shows that regulatory reform and liberalisation have created competitive pressures, stripping the national monopoly provider, Telecom Egypt (TE), of its market power. The market has diversified as the antiquated fixed (land)line system has been surpassed by rapid growth in the cellular market. Public sector reform and privatisation put efficiency pressures on the national incumbent (TE). These pressures resulted in improved outcomes for the main stakeholders, consumers, workers and the government, such as reduced prices, increased access and service quality.

Keywords: Telecommunications reform; Telecom egypt; Interrupted time-series; Regulatory reform; Liberalisation; Privatisation; Competition; Causal chain of reform; Reform indicators.

1432. How Does Trade Facilitation Affect International Trade?

Chahir Zaki

This article evaluates the effect of different aspects of trade facilitation in developed and developing countries on bilateral trade through an augmented gravity model and uses the latter to estimate ad valorem equivalents (AVEs) of administrative barriers to trade. The results show that a multitude of trade facilitation variables including internet, bureaucracy, corruption and geography affect the transaction times to import and to export. However, the time to import has a higher negative impact on trade when compared with the time to export. Another important finding is that both facilitation and liberalization of trade are complements rather than substitutes. Finally, when sectoral characteristics are taken into account, some perishable, seasonal and high-value-added products appear to be more sensitive to transaction time than other products. These results are also confirmed by the values of the AVEs.

Keywords: Border effects; Gravity models; Trade facilitation.

1433. Trade Volume and Economic Growth in the Mena Region: Goods or Services?

Fida Karama and Chahir Zaki

This paper explores the macroeconomic and sectoral effects of goods and service trade on the economic performance of MENA countries for the period 1960–2011. While the MENA region has been widely neglected in the trade and growth literature, this paper offers a decomposition of MENA GDP growth in order to disentangle the contributions of both service and goods trade. The results show a positive association between real GDP and both service and goods trade.

The interaction term between trade in goods and trade in services is negative, suggesting that as goods trade increases, the marginal effect of service trade on real GDP decreases. However, the overall effect of service trade on real GDP is positive. The decomposition of GDP growth reveals a greater impact of goods trade, although service trade is important, and for most countries greater than the effect of tertiary enrollment.

Keywords: Trade in goods; Trade in services; Growth; Mena region.

1434. Trade and Access to Finance of Smes: is there A Nexus?

Hala El-Said, Mahmoud Al-Said and Chahir Zaki

Limited resources and barriers to entry are critically higher for small and medium enterprises (SMEs) than for large companies. One of the reasons explaining why the resources of SMEs are scarce is their limited access to financial services. This in turn reduces the likelihood of exporting.

For this reason, using the census of SMEs done by the Central Bank of Egypt and the Egyptian Banking Institute, we try to examine the impact of access to finance on their export performance. We measure the latter by the extensive margin that means the probability of becoming an exporter and the probability of serving several markets. We found a significant and positive impact of dealing with banks and having banking facilities on the probability of exporting and that of exporting to more than one destination. Thus, wider and more efficient financial services are likely to increase the number of exporters and boost exports' diversification.

Keywords: Smes; Access to finance; Exports; Egypt.

1435. The Quality of Egypt'S State Budget: A Composite Index

Israa A. El Husseiny

A composite index of Egypt's State Budget that takes into account the composition of public expenditure, the composition of public revenues, and the ratio of budget deficit to GDP, is constructed for the period from fiscal year 1981/1982 to fiscal year 2014/2015. The overall trend of the constructed index during the period of analysis indicates that the quality of Egypt's State Budget has been deteriorating. Indeed, the two fiscal years of 2012/2013 and 2013/2014 recorded the lowest scores of the composite index, an issue that has implications on the government's fiscal sustainability.

Keywords: Budget quality; Composite index; Egypt'S state budget; Budget composition.

1436. Education for Sustainability: Vision and Action of Higher Education for Sustainable Consumption

Marwa Biltagy

International Journal of Economics and Finance, 7: 282-290 (2015)

This paper provides the context around why transformative learning and deeper engagement in sustainability issues is important. The way of learning is critical in promoting the skills and motivation needed for sustainability challenges. Sustainability education should be included much more than other knowledge acquisition i.e. integrating a transformative, participatory learning process that matches up behavior with knowledge. This paper focuses on how higher education institutions can promote sustainable consumption. Higher education has an important role to play concerning education for sustainable consumption and the construction of a learning society. The results include innovative strategies to change curricula; to shape public opinion and national policies for sustainability; to make sure that research serves the needs of social and economic development that is sustainable and to enable students to develop their knowledge, values and skills that society will need for real progress towards sustainable consumption.
Keywords: Education; Higher education; Sustainability; Sustainable development; Sustainable consumption.

Dept. of Statictics

1437. Phase II Multiple Linear Regression Profile with Small Sample Sizes

Mahmoud A. Mahmoud, Abd El Naser Saad and Reham El Shaer

Quality and Reliability Engineering International, 31: 851-861 (2015) IF: 1.191

In some statistical process control applications, the quality of a process or product is best represented by a functional relationship between a response variable and one or more explanatory variables. Different methods have been proposed in the literature to monitor phase II multiple linear regression profile. Most of the existing approaches assume the number of sample observations to be greater than the number of explanatory variables, a condition needed to estimate the model parameters and establish chart statistics. In practice, however, the sample size can be smaller than the number of the multiple linear regression parameters. None of the previous studies of multiple regression profiles approaches have tackled this problem. In the current study, two methods are proposed to handle the problem of profile monitoring with sample sizes smaller than the number of regression parameters. Simulation results show that both methods outperform the existing methods in the literature used to monitor multiple linear regression profile. Moreover, both methods work satisfactorily when existing methods cannot be applied, that is, when the sample size is smaller than the number of profile parameters.
Keywords: Exponentially weighted moving average (EWMA) charts; Multiple linear regression profiles; Phase Ii profile Monitoring; Statistical process control (SPC).

1438. A Reevaluation of the Adaptive Exponentially Weighted Moving Average Control Chart when Parameters are Estimated

Aya A. Aly, Nesma A. Saleh, Mahmoud A. Mahmouda and William H. Woodall

Quality and Reliability Engineering International, 31: 1611-1622 (2015) IF: 1.191

The performance of control charts can be adversely affected when based on parameter estimates instead of known in-control parameters. Several studies have shown that a large number of phase I observations may be needed to achieve the desired in-control statistical performance. However, practitioners use different phase I samples and thus different parameter estimates to construct their control limits. As a consequence, there would be in-control average run length (ARL) variation between different practitioners. This kind of variation is important to consider when studying the performance of control charts with estimated parameters. Most of the previous literature has relied primarily on the expected value of the ARL (AARL) metric in studying the performance of control charts with estimated parameters. Some recent studies, however, considered the standard deviation of the ARL metric to study the performance of control charts. In this paper, the standard deviation of the ARL metric is used to study the in-control and out-of-control performance of the adaptive exponentially weighted moving average (AEWMA) control chart. The performance of the AEWMA chart is then compared with that of the Shewhart X-bar and EWMA control charts. The simulation results show that the AEWMA chart might represent a good solution for practitioners to achieve a reasonable amount of ARL variation from the desired in-control ARL performance. In addition, we apply a bootstrap-based design approach that provides protection against frequent false alarms without deteriorating too much the out-of-control performance.
Keywords: Aewma control chart; Bootstrap; Estimation effect; ewma control chart; Shewhart control chart; Standard deviation of average run length; Statistical process control.

1439. Another Look at the EWMA Control Chart with Estimated Parameters

Nesma A. Saleh, Mahmoud A. Mahmoud, L. Allison Jones-Farmer, Inez Zwetsloot and William H. Woodall

Journal of Quality Technology, 47: 363-382 (2015) IF: 1.152

When in-control process parameters are estimated, Phase II control chart performance will vary among practitioners due to the use of different Phase I data sets. The typical measure of Phase II control chart performance, the average run length (ARL), becomes a random variable due to the selection of a Phase I data set for estimation. Aspects of the ARL distribution, such as the standard deviation of the average run length (SDARL), can be used to quantify the between-practitioner variability in control chart performance. In this article, we assess the in-control performance of the exponentially weighted moving average (EWMA) control chart in terms of the SDARL and percentiles of the ARL distribution when the process parameters are estimated. Our results show that the EWMA chart requires a much larger amount of Phase I data than previously recommended in the literature in order to sufficiently reduce the variation in the chart performance. We show that larger values of the EWMA

smoothing constant result in higher levels of variability in the in-control ARL distribution; thus, more Phase I data are required for charts with larger smoothing constants. Because it could be extremely difficult to lower the variation in the in-control ARL values sufficiently due to practical limitations on the amount of the Phase I data, we recommend an alternative design criterion and a procedure based on the bootstrap approach.

Keywords: Bootstrap; Estimation effect; Sdarl; Spc; Standard deviation of average run length; Statistical process control.

1440. The Difficulty in Designing Shewhart X-Bar and X Control Charts with Estimated Parameters

Nesma A. Saleh and Mahmoud A. Mahmoud

Journal of Quality Technology, 47: 127-138 (2015) IF: 1.152

The performance of the Shewhart X-bar control chart with estimated in-control parameters has been discussed a number of times in the literature. Previous studies showed that at least 400/(n - 1) phase I samples, where n being greater than 1 is the sample size, are required so that the chart performs on average as if the in-control process parameter values were known. This recommendation was based on the in-control expected average run length (ARL) performance. The reliance on the expected ARL metric, however, averages across the practitioner-to-practitioner variability. This variability occurs due to the different historical data sets that practitioners use, which results in varying parameter estimates, control limits, and in-control ARL values. This article shows that taking this type of variability into consideration leads to far larger amounts of phase I data than what was previously recommended. This is to ensure low levels of variation in the in-control ARL values among practitioners. The standard deviation of the ARL (SDARL) metric is used to evaluate performance for various amounts of phase I data. The authors show that no realistic phase I sample size is sufficient to have confidence that the attained in-control ARL is close to the desired value. The authors additionally investigate the effect of different process standard deviation estimators on the X-bar chart performance, showing that it is best to use a biased estimator. They also study the design of the X-chart for the case n = 1, drawing similar conclusions regarding the amount of phase I data. An alternative approach to designing control charts is recommended.

Keywords: Estimation effect; Phase I; Shewhart control chart; Standard deviation of average run length; SPC; Statistical process control.

1441. Eliciting Prior Distributions for Extra Parameters in Some Generalized Linear Models

Fadlalla G. Elfadaly and Paul H. Garthwaite

Statistical Modelling, 15: 345-365 (2015) IF: 0.977

To elicit an informative prior distribution for a normal linear model or a gamma generalized linear model (GLM), expert opinion must be quantified about both the regression coefficients and the extra parameters of these models. The latter task has attracted comparatively little attention. In this article, we introduce two elicitation methods that aim to complete the prior structure of the normal and gamma GLMs. First, we develop a method of assessing a conjugate prior distribution for the error variance in normal linear models. The method quantifies an

expert's opinions through assessments of a median and conditional medians. Second, we propose a novel method for eliciting a lognormal prior distribution for the scale parameter of gamma GLMs. Given the mean value of a gamma distributed response variable, the method is based on conditional quartile assessments. It can also be used to quantify an expert's opinion about the prior distribution for the shape parameter of any gamma random variable, if the mean of the distribution has been elicited or is assumed to be known. In the context of GLMs, the mean value is determined by the regression coefficients. Interactive graphics is the medium through which assessments for the two proposed methods are elicited. Examples illustrating use of the methods are given. Computer programs that implement both methods are available.

Keywords: Elicitation; Subjective prior Distribution; Normal linear model; Gamma distribution; Generalized linear model; Interactive graphical software.

1442. Planning Failure-censored Constant-Stress Partially Accelerated Life Test

Ali A. Ismail and Abdulhakim A. Al-Babtain

Journal of Systems Engineering And Electronics, 26: 644-650 (2015) IF: 0.506

This article deals with the case of the failure-censored constant-stress partially accelerated life test (CSPALT) for highly reliable materials or products assuming the Pareto distribution of the second kind. The maximum likelihood (ML) method is used to estimate the parameters of the CSPALT model. The performance of ML estimators is investigated via their mean square error. Also, the average confidence interval length (IL) and the associated coverage probability (CP) are obtained. Moreover, optimum CSPALT plans that determine the optimal proportion of the test units allocated to each stress are developed. Such optimum test plans minimize the generalized asymptotic variance (GAV) of the ML estimators of the model parameters. For illustration, Monte Carlo simulation studies are given and a real life example is provided.

Keywords: Reliability; Confidence intervals; Coverage probabilities; Optimum test plans; Type-Ii censoring monte carlo simulation.

1443. Parameter Estimation Under Failure-censored Constant-stress Life Testing Model: A Bayesian Approach

Ali A. Ismail

Sequential Analysis-Design Methods and Applications, 34: 264-276 (2015) IF: 0.5

This article compares likelihood and Bayesian estimations for partially accelerated constant-stress life test model under type II censoring assuming Pareto distribution of the second kind. Both maximum likelihood and Bayesian estimators of the model parameters are derived. The posterior means and posterior variances are obtained under the squared error loss function using Lindley's approximation procedure. The advantages of this proposed procedure are shown. Monte Carlo simulations are conducted under different samples sizes and different parameter values to assess and compare the proposed methods of estimation.

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A noninformative prior on the model parameters is used to make the comparison more meaningful. It has been observed that Lindley's method usually provides posterior variances and mean squared errors smaller than those of the maximum likelihood estimators. That is, Lindley's method produces improved estimates, which is an advantage of this method.

Keywords: Bayesian estimation; Failure censoring; Maximum likelihood estimation; Pareto distribution; Partially accelerated constant-Stress test; Squared error loss function.

1444. Optimum Partially Accelerated Life Test Plans with Progressively Type-I Interval Censored Data

Ali A. Ismail

Sequential Analysis-Design Methods and Applications, 34: 135-147 (2015) IF: 0.5

Because of continual improvement in manufacturing design, one often deals with high quality products that are highly reliable with a substantially long life span. This article discusses k-level step-stress partially accelerated tests under type I progressive interval censoring with equal inspection intervals of length t. It is assumed that the lifetime of a testing unit follows a Weibull distribution. The problem of choosing the optimal t is considered according to a certain optimality criterion. Two selection criteria that enable us to obtain the optimum test plans are investigated. Monte Carlo simulations are presented to illustrate the proposed methods.

Keywords: Design; Inspection; Partially accelerated Step-stress Test; Reliability analysis; Type I progressive censoring; Weibull distribution.

1445. A Comparison of the Performance of Phase Ii Simple Linear Profile Control Charts when Parameters are Estimated

Aya A. Aly, Mahmoud A. Mahmoud and William H. Woodall

Communications in Statistics - Simulation and Computation, 44: 1432-1440 (2015) IF: 0.325

The standard deviation of the average run length (SDARL) is an important performance metric in studying the performance of control charts with estimated in-control parameters. Only a few studies in the literature, however, have considered this measure when evaluating control chart performance.
The current study aims at comparing the in-control performance of three phase II simple linear profile monitoring approaches;namely, those of Kang and Albin (2000), Kim et al. (2003), and Mahmoud et al. (2010).The comparison is performed under the assumption of estimated parameters using the SDARL metric. In general, the simulation results of the current study show that the method of Kim et al. (2003) has better overall statistical performance than the competing methods in terms of SDARL values. Some of the recommended approaches based solely on the usual average run length properties can have poor SDARL performance.

Keywords: Estimation effect; Ewma; Phase Ii analysis; Profile monitoring; Standard deviation of average run length; Statistical process control.

1446. Efficient Estimation in A Two-Stage Randomized Response Model

Sally Abdelfatah and Reda Mazloum

Mathematical Population Studies, 22: 234-251 (2015) IF: 0.292

A two-stage randomized response model is devised to circumvent the lack of answers to a sensitive question. Respondents who have not answered the sensitive question in the first stage are requested in the second stage to either answer the sensitive question (second attempt then) or to draw a card indicating "yes" or "no". In the latter case, they are required to report the outcome. This apparently innocent device helps to build a more efficient estimator of the proportion of the population having a given sensitive attribute. The procedure also increases the respondents' cooperation. As other estimators of the proportion of the population having a given sensitive attribute using randomized response models, this estimator can formally take values outside the unit interval, a possibility which should not be allowed. The minimum sample size for which the frequency of estimates outside [0,1] is small enough is obtained by simulation.

Keywords: Estimation of proportion; Randomized response; Relative efficiency; Simple random sampling; Simulation;Two-stage procedure.

1447. Bayesian Modelling of Health Insurance Losses

Zeinab Amina and Maram Salem

Journal of Applied Statistics, 42:2: 231-251 (2015)

The purpose of this paper is to build a model for aggregate losses which constitutes a crucial step in evaluating premiums for health insurance systems. It aims at obtaining the predictive distribution of the aggregate loss within each age class of insured persons over the time horizon involved in planning employing the Bayesian methodology. The model proposed using the Bayesian approach is a generalization of the collective risk model, a commonly used model for analysing risk of an insurance system. Aggregate loss prediction is based on past information on size of loss, number of losses and size of population at risk. In modelling the frequency and severity of losses, the number of losses is assumed to follow a negative binomial distribution, individual loss sizes are independent and identically distributed exponential random variables, while the number of insured persons in a finite number of possible age groups is assumed to follow the multinomial distribution. Prediction of aggregate losses is based on the Gibbs sampling algorithm which incorporates the missing data approach.

Keywords: Collective risk model; Gibbs sampling; Health insurance; Kernel estimation; Predictive distribution; Bayes premium.

1448. An Improved Stratified Randomized Response Model Using two Decks of Cards

Sally Abdelfatah and Reda Mazloum

Model Assisted Statistics and Applications, 10: 309-320 (2015)

Randomized response technique is an effective research method that is used to estimate the proportion of a population that possesses a sensitive characteristic, such as tax evasion, abortion,

or drug abuse. In this paper, two recently developed randomized response models using two decks of cards are extended to the case of stratified random sampling. Under proportional allocation or optimal allocation for fixed sample sizes, it is shown that the proposed stratified estimators are always more efficient than their counterparts in simple random sampling. Comparing the two proposed models, it is found that one of the models can be adjusted to be more efficient than the other, and that this model can increase the respondents' cooperation. Hence this model is referred to as the improved model. for unknown strata sizes, the double sampling method for stratification is applied.

Keywords: Sensitive characteristic; Estimation of proportion; Relative efficiency; Optimal allocation; Double sampling.

Faculty of Commerce

Dept. of Accounting

1449. Do Corporate Governance Disclosures Matter for Bank Cost of Capital Empirical Evidence from Accounting Statements of Egyptian Banks

Mona A. Elbannan and Mohamed A. Elbannan

Accounting and Finance Research, 4: 59-77 (2015)

The purpose of this study is to examine the association between the quality of bank governance mechanisms disclosed in bank annual reports and cost of capital. The Egyptian banking sector has undergone a series of legislative reforms starting with the issuance of the 2003 banking law. The law incorporates the guidelines of the Basel Accords and governance principles, and was declared a major step forward into facing global banking competition and driving financial growth in Egypt. We create two multivariate cross-sectional, time-series regression models to test this relation. Our main results show that there is a highly significant relation between bank governance disclosures and cost of capital. Banks with reported large board size and more executive directors on board are able to obtain finance from cheaper resources. This indicates that cost of equity of Egyptian banks is not just related to accounting performance and risk but also related to how well a bank is governed. Furthermore, the cost of deposits decreases significantly for banks reporting better governance mechanisms.

Keywords: Disclosure; Corporate governance; Accounting; Banking; Cost of equity; Cost of deposits; Egypt.

1450. Economic Consequences of Bank Disclosure in the Financial Statements Before and During the Financial Crisis Evidence from Egypt

Mohamed A. Elbannan and Mona A. Elbannan

Journal of Accounting Auditing and Finance, 30: 181-217 (2015)

This study examines whether bank risk disclosures are associated with operating performance and market valuation. Due to the inherent opaqueness of banking operations, regulators require increased risk disclosures to facilitate proper monitoring. However, the question of whether these increased disclosures reflect on performance and market value remains open in emerging markets. We measure bank operating performance using a balanced scorecard approach and find that higher risk

disclosure is associated with higher operating performance and market valuation in a sample of Egyptian banks. Banks moving from the lowest to the highest risk disclosure deciles increase their risk-adjusted rate of return and market valuation roughly by 3.53 percentage points and by 0.068 basis points, respectively. That is, banks that are accustomed to providing relatively high level of risk disclosures "internalize" the performance lessons more fully and market participants value these increased disclosures. The setting is especially relevant to the study because it involves an emerging economy where banks have high-risk exposure due to global and local events that increased business uncertainties.

Keywords: Disclosure; Performance; Balanced scorecard; Tobin's q; Global financial crisis.

1451. Information Content of Sfas 157 Fair Value Reporting

Mohamed A. Elbannan and Mona A. Elbannan

Journal of International Accounting, Auditing and Taxation, 25: 31-45 (2015)

This paper examines whether SFAS 157 fair value hierarchy information is associated with stock price synchronicity and whether the relation is moderated by the quality of the firm's information environment. If SFAS 157 information is useful, stock prices of reporting firms should incorporate more firm-specific information and hence exhibit lower synchronicity (measured as the R2 from a market model regression). The sample consists of 3538 firm-years of listed firms reporting SFAS 157 fair values during the period 2008–2009. Evidence suggests that synchronicity is negatively related to aggregate fair values, that the relation does not monotonically change across the fair value levels, and stock prices of firms with ex ante higher quality information environment exhibit weaker differences between fair value levels in their effect on synchronicity. Finally, we further partition the sample into financial and non-financial firms and find that liabilities (assets) are viewed as having a stronger impact on these cash flows than assets (liabilities) in the case of financial (non-financial) firms.

Keywords: SFAS 157; Fair value; Synchronicity.

1452. Factors Influencing Students' Choice of an Accounting Major in Egypt

Ahmed Anis and Rasha Hanafi

International Journal of Accounting, Auditing and Performance Evaluation, 11: 225-254 (2015)

This paper explores the perception of Egyptian students of the factors influencing students' choice of an accounting major in Egypt. Six factors were used to identify what influences students' choice of degree major: 1) perceptions of the accounting profession; 2) personal skills; 3) important referents; 4) perceptions of accounting education; 5) impression of introductory accounting courses; 6) gender. Data were collected using a structured questionnaire from 273 students in business schools in Egypt. The results of the discriminant analysis show that the only substantive discriminating variables are perceptions of accounting education, perceptions of the accounting profession, personal skills and important referents, while

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'impression of introductory accounting courses' and 'gender' (not loaded on the discriminant function), are the weakest predictors and suggest that they are not associated with the choice of degree major. The paper provides academics with insights into the development of accounting education.

Keywords: Accounting education; Accounting profession; Major choice; Egypt.

Dept. of Business Administration

1453. The Role of Islamic Religiosity on the Relationship Between Perceived Value and Tourist Satisfaction

Riyad Eid and Hatem El-Gohary

Tourism Management, 46 February 2015: 477-488 (2015) IF: 2.554

Although Muslims make up one of the largest tourist markets in the world, knowledge related to the Islamic perspective on tourism is still less represented in the related literature. This study aims to assemble the theoretical foundations of Islamic tourism thoughts in relation to modern tourism paradigms. It aims to investigate the moderating effect of Islamic religiosity on the relationship between Muslim customer perceived value (MCPV) and Muslim customer satisfaction. It studies a sample of 537 Muslim tourists and employs a positivist research approach with a quantitative basis of the enquiry, a survey strategy through questionnaires, and structural equation modeling (SEM). Six dimensions of Muslim customer perceived value (quality, price, emotional value, social value, Islamic physical attributes value and Islamic non-physical attributes value) were found to have positive effects on Muslim consumer satisfaction. The findings of the study suggest that Islamic religiosity moderates the effects of Islamic physical attributes value and Islamic non-physical attributes value on Muslim customer satisfaction. The findings reinforce the importance of religiosity in understanding Muslim customer satisfaction and behavior.

Keywords: Customer value; Islamic religiosity; Customer satisfaction; Structural equation modeling (SEM); Tourism industry.

1454. Muslim Tourist Perceived Value in the Hospitality and Tourism Industry

Riyad Eid and Hatem El-Gohary

Journal of Travel Research, 54 (6): 774-787 (2015) IF: 2.442

Perceived value is a subjective and dynamic construct that varies among different customers and cultures. Although perceived customer value has been studied by many researchers, no research has been done into the measurement of Muslim Tourist Perceived Value (MTPV) where Muslim tourist evaluates both traditional and religious aspects of value. By means of a multidimensional procedure, the authors developed a scale of measurement of MTPV through 24 items grouped into six dimensions: quality, price, emotional, social, Islamic physical attributes, and Islamic nonphysical attributes. The importance of the proposed constructs was theoretically justified. Using a sample of 537 Muslim tourists, the constructs were tested and validated. The results supply tourism companies with a number of operative factors that

may be essential if they are to remain competitive in the dynamic marketplace. This study is probably the first to provide an integrative perspective of MTPV constructs in the hospitality and tourism industry.

Keywords: Customer value; Muslim; Tourism and hospitality and scale development.

1455. An Investigation of Market Orientation and Tourism Smes Performance in Developing Countries: A Review of the Literature

Syed Mohsin Ali Shah, Hatem El-Gohary and Javed Ghulam Hussain

Journal of Travel and Tourism Marketing, 32 (8): 990-1022 (2015) IF: 0.736

This paper aims to build a structured literature review of the field of market orientation and its impact on tourism small and medium-sized enterprises (SMEs) performance in developing countries. This literature review will present a comprehensive survey of market orientation (MO) published articles to facilitate a good understanding of MO. It serves as an archive and aims to help the scholars and practitioners to explore, analyse, and develop a clear understanding about the different research points and methodologies implemented in previous studies related to MO and its impact on tourism SMEs' performance. The paper systematically reviews and categorizes the published literature implementing a three-stage methodology, and thereafter analyzes and reviews this literature methodologically. The review covered many areas and identified some factors that drive/hinder market-oriented activities within tourism SMEs. Furthermore, suggestions have been made to understand more thoroughly how market orientation influences tourism SMEs performance in developing economies. A research gap in the area of market orientation and tourism SMEs performance in developing countries was identified. The study provides great benefits for owner-managers, government policy makers, scholars, and educators by clarifying the concept of market orientation and its relationship with performance in the context of tourism SMEs.

Keywords: Market orientation; Tourism small and medium-Sized enterprises; Smes; Performance; Literature review; Tourism in developing countrie.

1456. An Investigation of the Different Factors Affecting the Adoption of Water Filters in South Mediterranean Countries: the Case of Egypt

Abd El-Shafey I Ahmed, John N Hay and Hatem El-Gohary

Journal of Economic and Administrative Sciences, 31 (1): 2-19 (2015)

Purpose: Undoubtedly, saving the environment and avoiding environmental damage is one of the major challenges facing any government. The purpose of this paper is to add to the accumulative knowledge in the field through investigating the different factors affecting the adoption of newly developed water filters by Egyptian farmers to reduce the massive air pollution resulting from burning rice straw. Such investigation will help in achieving a deep and reflective understanding of current adoption practises by Egyptian farmers. Design/methodology/approach –

To understand the different factors that might have an impact on the adoption of newly developed water filters by Egyptians, a survey research strategy, as well as a focus groups mechanism, were conducted employing triangulation methodology in which quantitative and qualitative data were collected based on a post-positives approach. This quantitative study was performed in five local councils in Al-Sharqiyah Governorate, one of the biggest governorates in rice production in Egypt, based on a questionnaire built on some parameters related to Egyptian farmers' perceptions of clean water. Statistical analysis was performed using Statistical Package for the Social Sciences to analyse the collected data and evaluate the ability to promote the newly developed filters. Findings – The findings indicated that the adoption of water filters by Egyptian farmers is affected by two groups of factors, namely personal factors and water-related factors. With regard to this, it was found that age, cost, farmers' attitudes towards using water filters, farmers' trust in the water pipes systems, and the usefulness of the filters have a positive impact on water filters adoption by Egyptian farmers. The findings also indicate that water filters adoption by Egyptian farmers has a positive impact on a farmer's intention to buy a water filter and their intention to share a water filter with others. Research limitations/implications – The paper will provide great benefits for entrepreneurs, policy makers, practitioners, and researchers through providing a clearer view and deep understanding for the issues related to different factors affecting the adoption of newly developed water filters by Egyptian farmers. Originality/value – This research adds to the relatively limited empirical research that has been conducted on water management in south Mediterranean countries. Moreover, the findings and results of this study will provide great assistance and benefit to business owners, practitioners and governmental agencies concerned with water management in south Mediterranean countries since it reveals a number of dynamics and potential scenarios that should be taken into consideration.
Keywords: Egypt; Environmental damage; Rice straw; South mediterranean countries; Water filters; Water management.

1457. Determinants of Capital Adequacy Ratio: an Empirical Study on Egyptian Banks

Osama A. El-Ansary and Hassan M. Hafez

Corporate Ownership and Control, 13: 806-816 (2015)

Capital adequacy rules are safety valve for regulators and banks' clients/shareholders to reduce expected risks faced by commercial banks especially for cross border transactions as these rules are applied compulsory by all banks internationally. Applying these rules will achieve rational management and governance. This paper examines explanatory victors that influence capital adequacy ratio (CAR) in the Egyptian commercial banks. The study covers 36 banks during the period from 2004-2013. We examined the relationship between CAR as dependent variable and the following independent variables: earning assets ratio, profitability, and liquidity, Loan loss provision as measure of credit risk, net interest margin growth, size, loans assets ratio and deposits assets ratio. Furthermore, we investigate determinants of CAR before and after the 2007- 2008 international financial crises. Results vary according to the period understudy. For the whole period 2003 to 2013 results show that liquidity, size and management quality are the most significant variables. Before the period 2008 results show that asset quality, size and profitability are the most significant variables. After the period 2009 results

show that asset quality, size, liquidity, management quality and credit risk are the most significant variable that explain the variance of Egyptian banks' CAR.
Keywords: Capital adequacy ratio (Car); Commercial banks; Risk based capital; Basel (I) ; (Ii); Egypt; Financial crisis.

1458. Effects of Religiosity on Consumer Attitudes Toward Islamic Banking in Egypt

Mariam Mourad Hussein Abou-Youssef, Wael Kortamm, Ehab Abou-Aish and Noha El-Bassiouny

International Journal of Bank Marketing, 33: 786-807 (2015)

Purpose : The purpose of this paper is to explore the effect of Islamic religiosity on consumer attitudes toward Islamic banking in Egypt. Design/methodology/approach – The study utilizes a mixed-methods approach, employing both qualitative in-depth interviews and quantitative surveys. Findings – The main findings of the study show that religiosity has an impact on consumer attitudes toward Islamic banking in Egypt. Major religiosity clusters were identified from the sample and these were associated with attitudes toward Islamic banking. Practical implications – The findings of this research are of practical importance for marketers in Islamic banks, as they reflect on the likely role religiosity would play in shaping the attitudes of potential customers toward their products. Thus, marketers can use the religiosity scale in measuring intention to use their banking services. Originality/value – The study was implemented in Egypt, where the volume of research on this topic is very limited; thus the context of the study is of value to researchers and practitioners and it can serve as a base for future studies in the Middle East region.
Keywords: Consumer behaviour; Consumer attitudes; Egypt; Islamic banks; Islam; Religiosity.

1459. Leveraging Organizational Performance Via Knowledge Management Systems Platforms in Emerging Economies: Evidence from the Egyptian Information and Communication Technology (ICT) Industry

Gamal Mohamed Shehata

Vine, 45 (2): 239-278 (2015)

Purpose : The purpose of this paper is to examine the impact of adopting knowledge management systems (KMSs) on firms' performance. Although many organizations have adopted the notion of KMS, there is little evidence on the effect of KMS on a firm's performance, especially in an emerging economy like the Egyptian one. An intensive literature review is conducted not only to synthesize but also to establish the conceptual foundations for the systemic perspective of knowledge management and its potential impact on knowledge management performance in an emerging information and communication technology (ICT) industry. This systemic perspective fits with the evolutionary nature of such an emerging industry in Egypt Design/ methodology/ approach – The empirical study of this work is conducted on knowledge - intensive firms operating in the field of ICT. The paper is descriptive in nature where a quantitative research design is adopted to survey senior managers' perceptions – from both national and multinational enterprises operating in

Egypt – on the pay-off maintained from creating an integrative KMS. The primary data are collected from 90 managers holding significant top positions related to the knowledge management area. A linear simple regression test is conducted to discover the initial association between the conceptual model's key variables. Findings – The results of this work reveal that there is a positive association between each of the six elements that constitute a KMS, namely, knowledge: creation, acquisition, codification, sharing, transfer and measurement, and the perceived knowledge management performance. Besides, there is a significant positive association between the adopted total KMS and perceived knowledge management performance.

This study provides strong evidence that KMSs are essential to improve firms' performance. The results of t-test and analysis of variance assert that the gender, types of business, year of experience and age of respondents have no significant difference to perceived knowledge management performance resulting from KMS. Research limitations / implications – The findings reflect the fact that informants have to deploy six components that constitute a KMS to realize improvements in knowledge management performance.

This work also highlights a number of findings of great value to managers in the ICT sector. Yet, the empirical study does not cover all the issues which are linked to KMS implementation. Issues such as culture, trust and leadership role in building a significant KMS are not examined in this work. Also, the generalizability of the findings to other industries must be considered carefully. Although the findings are statistically significan t, the framework developed may be quite specific to the ICT organizations. Practical implications – This paper enhances managers ' understanding in deploying the notion of KMSs to leverage their corporate performance. It also provides managers in emerging markets with an integrative perspective to fundamental issues that encounter them when they put those KMSs into practice. Social implications – This research advances understanding of the application and benefit of KMS in ICT firms in several ways: it provides a better understanding of KMS and practices currently being applied in the Egyptian ICT firms.

There had been little or no industry-wide empirical research on this topic to date, it provides a better understanding of knowledge processes in the ICT sector; specifically, the links between knowledge acquisition, creation , codification, sharing, transfer and measurement, and their links to performance, the measurement instruments developed for this research constitute a reliable set of construct measures that provide a basis for future research Originality / value – This paper advances the knowledge management subject by synthesizing past studies into an integrative KMS that directs scholars' attention on how to examine the notion .

It is claimed that KMS help those managers improve core business processes, management decisions and, accordingly, firms' performance. Besides, this study suggests a set of implications for managers in an emerging market that has recently adopted the notion of KMSs. This study also reflects the viewpoints and perceptions of key managers in a strongly evolving knowledge-intensive industry that has an increasing impact on the GDP of an entire nation throughout the past two decades.

Keywords: Egypt; Emerging economies; Knowledge management; Knowledge; Information and communication technology (ICT); Knowledge management systems.

1460. Customer Participation in Online Co-Creation Experience: the Role of E-Service Quality

Tamer H. Elsharnouby and Abeer A. Mahrous

Purpose : This exploratory paper aims to extend the research on customer co-creation behavior into an emerging market. To this end, it empirically examines the influence of e-service quality dimensions on customers' willingness to participate in online co-creation experience, in conjunction with customer attitude and intention. Design/methodology / approach – Data from a sample of 215 customers from the Egyptian telecommunication sector were collected and analyzed using structural equation modeling technique. Findings – The findings suggest that, although five e-service quality dimensions (efficiency, system availability, privacy, responsiveness and compensation) affect the attitude toward the Web site, another set of the dimensions (efficiency, fulfillment, compensation and contact) affects customers' willingness to participate in the co-creation experience. The findings also support that customers' attitudes toward the Web site affect the intention to use the Web site, which, in turn, affects customers' willingness to participate in the online co-creation experience. Practical implications – In their move toward mass customization, companies face the challenge of engaging a huge number of users. Deep and engaging interactions with customers could be one of the differentiators a company might cultivate to serve the market better. Thus, online co-creation activities might broaden the horizon for a cost-effective approach striving for close ties and a high level of customer engagement. Originality/value – Despite the intensive use of the Internet in distributing e-services, little attention has been paid thus far to extend e-service quality models to incorporate customer participation in the online co-creation experience. In particular, this exploratory study identifies the important dimensions of e-service quality that influences customers' willingness to participate in the online co-creation experience.
Keywords: Customer experience; Eservice quality.

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Dept. of French Language and its Literature

1461. Du Voyage Pédagogique à la Pédagogie Viatique: le Cas de Ḥasan Tawfīq al-ʿAdl

Rania Gouda Mohamed Gado

Arabica, 62 (4): 551-569 (2015)

This article deals with different relations between travel and pedagogy in al-Riḥla ilā Birlīn and Rasāʾil al-bušrā fī l-siyāḥa bi Almāniyā wa-Swīsrā, two travel accounts written by Ḥasan Tawfīq al-ʿAdl and published in Egypt between 1887 and 1892. The study allows to show how these texts tend to a pedagogy book. This pedagogical thought of author is combined with a practice. As a teacher as well as a learner, he communicates to the reader not only a big material of teaching but also his experience of learning. In these two travel accounts, the pedagogy is looking as a metaphoric extension of trip. Itinerary, mobility, urge to have a guide, contact with the other one and several elements relating to travel account are appealed to define the pedagogical activity and to practise it.
Keywords: Switzerland; Ḥasan Tawfīq al-ʿAdl; littérature arabe; Suisse; Naḥda; Travel account; Récit de voyage; Naḥda; Arabic literature; pedagogy; Allemagne; Germany; pédagogie.

Dept. of German Language and its Literature

1462. Erscheinungen Zwischen Imagination Und Wirklichkeit Konrads Von Würzburg Der Welt Lohn Und Engelhard

Dina Aboul Fotouh Salama

Kodikas / Code. Ars Semeiotica. An International Journal of Semiotics., 37. / 1/2: 99-122 (2015)

The allegorical personification of the world as a woman, called Frau Welt (Mrs. World), in Der Welt Lohn (The World's Reward) (before 1260) and the angel, seen in a dream, in Engelhard (between 1273/1274) are two important visual apparitions in two epic works of the German medieval poet Konrad von Würzburg (ca.1230-ca.1287), which take part in the construction of a fictive reality. It is the aim of this study to determine the function of these fictive images by exploring textual strategies. Therefore, the emergence and presentation of both apparitions as objects of an internal perception – represented by and in words – will be examined, in order to identify the narrative tools that transform these inner imaginations into externally perceptible images, capable of constructing their own reality. To this end, the study will take into consideration both medieval and modern aesthetic and cultural categories within a semiotic frame.
Keywords: Konrad von würzburg; Der welt lohn; Engelhard; Visual apparitions, Medieval construction of reality; Internal perception; Imagination; Semiotic.

1463. Frauenbild (er) in Arthur Schnitzlers Traumnovelle

Dalia Aboul Fotouh Salama

Kodikas/Code. Ars Semeiotica. An international Journal of Semiotics, (2015)

in Arthur Schnitzler's Traumnovelle, published in 1926, the married couple Albertine and Fridolin confess their hidden sexual desires and fantasies to each other. Deeply disturbed by the confessions of his wife, Fridolin then goes on a "night journey" through Vienna. Although the nocturnal adventures, in their dream-like sequencing, appear as dream images or a fantastically distorted reality, it is not clear on which level of perception the events are taking place. The decisive factor is that the experiences of the male protagonist, his own inner perceptions are represented. Through its dream-like narrative mode, the dream as a perceptual process, as the inner vision of images, merges with the perception of the outside world. It is the main subject of this study to analyze the women who appear to Fridolin at different levels of perception and in the space between imagination and reality, to reveal their construction as a result of imagination, and to determine their function in the fictional world of the protagonist.
Keywords: Traumnovelle; Imagination; Reality; Schnitzler; Wünsche; Bilder; Frauen; Traum.

Faculty of Archaeology

Dept. of Conservation

1464. Mineralogical Characterization of Islamic Stucco: Minaret of Shams El-Deen El-Wasty, Bulaq, Egypt

Abdullah M.A. Kamel, Hassan A.H. Marie, Hala A. Mahmouda, and Mona F. Ali

Construction and Building Materials, 101: 692-701 (2015) IF: 2.296

The mosque of Shams El-Deen El-Wasty, a building located in Cairo, Egypt that was built in the 9th century A.H., and has a stucco minaret that is suffering from a great deal of deterioration that has caused the complete loss of some stucco decorations and other parts that need restoration and conservation, so a solution for this problem has become urgent. A physiochemical study using analytical techniques such as XRD, FTIR and SEM.EDX was done. All analytical methods indicated that the stucco minaret contains gypsum, lime, and quartz. The samples of brick joint mortars consist of calcite, quartz, charcoal, gravels, brick dust, pieces of limestone, and organic additives look like chopped straw. The chemical–physical study of the deteriorated stucco samples proved that anhydrite is the main deterioration aspect.
Keywords: Stucco; Minaret; Gypsum; Lime; Deterioration; Conservation.

1465. Evaluation of Wood Treated With Some Natural Extracts and Paraloid B-72 Against The Fungus Trichoderma Harzianum: Wood Elemental Composition, in-Vitro and Application Evidence

Maisa M.A. Mansour and Mohamed Z.M. Salem

international Biodeterioration & Biodegradation, 100: 62-69 (2015) IF: 2.131

The damage in wood is commonly associated with fungi which do not affect wood strength. This study investigates the in-vitro

growth inhibition of Trichoderma harzianum, a well-known fungus, by different methanol extracts from selected tree species. We observed the hyphal growth by the environmental scan electron microscope (ESEM) and evaluated the changes in the elemental composition by the electron dispersive X-ray spectroscopy (EDX). The methanolic extracts of Morus alba heartwood and Maclura pomifera bark had significant effects ($P < 0.001$) on the linear growth of T. harzianum. The treated wood samples of Acacia saligna with the methanolic extract of Cupressus sempervirens wood showed an inhibition zone against the growth of T. harzianum around the treated wood at the concentrations of 5, 10, and 20%. However, ESEM and EDX analyses of treated wood demonstrated that the combination of Paraloid B-72 and the methanolic extract of C. sempervirens wood might be used as a potent biocide against the mold fungus T. harzianum.

Keywords: Wood; Natural extracts; Trichoderma harzianum; Paraloid B-72; Edx; Esem; Elemental composition.

1466. Analytical Study of Saint Gregory Nazianzen Icon, Old Cairo, Egypt

Yousry M. Issa, Gomaa Abdel-Maksoud and Mina Magdy

Journal of Molecular Structure, 1100: 70-79 (2015) IF: 1.602

The study aims to evaluate the state of icon through characterization of the icon layers (ground, paint and varnish layers) and to provide tools for assessment the impact of aging and environmental conditions in order to produce some solutions for conservation of the icon. Analytical techniques used in this study were attenuated total reflection-Fourier transform infrared spectroscopy (ATR-FTIR), field emission scanning electron microscope-energy dispersive X ray spectroscopy (FESEM-EDX) and amino acid analyzer (AAA). The results obtained revealed that gypsum and lead white were used for ground layer. The identified pigments were lamp carbon black, brown ochre, Prussian blue, yellow ochre and gold leaf. Egg yolk was the binder used with most of pigments and animal glue was used with gold color. The varnish used was shellac resin. It was concluded that stable pigments gave permanent colors and environmental conditions had an influence on promotion of oxidation process. Auto-oxidation of binder and varnish materials occurred by the action of pigment components and light result in cracking of the paint film and fading of the varnish glaze.

Keywords: Icon; ATR-FTIR; Fesem-Edx; AAA; Deterioration.

1467. The Orthopedic Diseases of Ancient Egypt

Klaus O Fritsch, Heshem Hamoud, Adel H. Allam, Alexander Grossmann, Abdel-Halim Nur El-Din, Gomaa Abdel-Maksoud, Muhammad Al-Tohamy Soliman, Ibrahim Badr, James D Sutherland, M. Linda Sutherland, Mahmoud Akl, Caleb E Finch, Gregory S. Thomas, L. Samuel Wann and Randall C Thompson

The Anatomical Record, 298: 1036-1046 (2015) IF: 1.542

Background: CT scanning of ancient human remains has the potential to provide insights into health and diseases. While Egyptian mummies have undergone CT scans in prior studies, a systematic survey of the orthopedic conditions afflicting a group of these ancient individuals has never been carried out.

Methods: We performed whole body CT scanning on 52 ancient Egyptian mummies using technique comparable to that of medical imaging. All of the large joints and the spine were systematically examined and osteoarthritic (OA) changes were scored 0-4 using Kellgren and Lawrence classification.

Results: The cruciate ligaments and menisci could be identified frequently. There were much more frequent OA changes in the spine (25 mummies) than in the large joints (15 cases of acromioclavicular and/or glenohumeral joint OA changes, five involvement of the ankle, one in the elbow, four in the knee, and one in the hip).

There were six cases of scoliosis. individual mummies had the following conditions: juvenile aseptic necrosis of the hip (Perthes disease), stage 4 osteochondritis dissecans of the knee, vertebral compression fracture lateral patella-femoral joint hyper-compression syndrome, severe rotator cuff arthropathy, rotator cuff impingement, hip pincer impingement, and combined fracture of the greater trochantor and vertebral bodies indicating obvious traumatic injury. This report includes the most ancient discovery of several of these syndromes.

Conclusions: Ancient Egyptians often suffered painful orthopedic conditions. The high frequency of scoliosis merits further study. The pattern of degenerative changes in the spine and joints may offer insights into activity levels of these people.

Keywords: Orthopedic conditions; Ancient egypt mummies; CT scanning.

1468. Comparative Evaluation of Some Woody Tree Methanolic and Paraloid B-72 Against Phytopathogenic Mold Fungi Alternaria Tenuissima and Fusarium Culmorum

Maisa M. A. Mansour, Ahmed Abdel-Megeed, Ramadan A. Nasser and Mohamed Z. M. Salem

Bioresources, 10: 2570-2584 (2015) IF: 1.425

Natural compounds from certain timber trees are highly valued and recommended to protect wood and wood products against mold fungi.

This study highlighted the use of some natural extracts and Paraloid B-72 against the growth of two mold fungi, namely Alternaria tenuissima and Fusarium culmorum. From the in vitro experiment, the methanol extracts of Callistemon viminalis bark were effective against the growth of F. culmorum, as were Magnolia grandiflora leaves against A. tenuissima. Environmental scanning electron microscopy (ESEM) and electron dispersive X-ray spectroscopy (EDX) analysis of treated Acacia saligna wood with the two fungi and Paraloid B-72 demonstrated the clear hyphal growth of F. culmorum and A. tenuissima and changes in elemental chemical composition.

After three months, no fungal growth on the wood surface treated with the methanol extract of M. pomifera bark was found. After three months of treating wood with Paraloid B-72 at 5% and 10%, the mold growth was visible. Almost all of the wood treated with methanol extracts showed growth of the A. tenuissima hypha, as well as some contamination by other microorganisms, except for the wood treated with the methanol extract of M. pomifera bark.

Keywords: Alternaria Tenuissima; Fusarium Culmorum; Wood; Natural Extracts; Paraloid B-72; Edx; Esem.

Humanities Sector

1469. Natural Durability of Citharexylum Spinosum and Morus Alba Woods Against Three Mold Fungi

Maisa M. A. Mansour, Mohamed Z. M. Salem, Mohamed H. Khamis and Hayssam M. Ali

The natural durability of wood to mold fungi was tested under laboratory conditions with locally sourced Citharexylum spinosum and Morus alba woods. The mold fungi were Penicillium selerotigenum, Paecilomyces variotii, and Aspergillus niger. Changes in surface elemental composition were evaluated with energy dispersive X-ray spectroscopy (EDX) and the biodeterioration of wood surfaces by scanning electron microscope (SEM).

The C peak element of C. spinosum wood was affected significantly ($P = 0.0004$) and decreased from 49.91% in the control specimens to 47%, 40.1%, and 40% with P. selerotigenum, A. niger, and P. variotii, respectively. Also, the C peak element of M. alba heartwood significantly decreased ($P < 0.0001$) from 51.33% in the control specimens to 41.49%, 45.66%, and 43.66% in wood inoculated with A. niger, P. variotii, and P. selerotigenum, respectively.

The elements Al and Cu were observed in high percentages with M. alba heartwood inoculated by P. variotii. The methanol extract from M. alba heartwood showed good inhibition against the growth of A. niger at a concentration of 32 µg/mL, and the methanol extract from C. spinosum wood showed remarkable inhibition against the growth of P. variotii at a concentration of 8 µg/mL. The results of this study clearly showed the changes that occur in wood samples as a result of fungal infestation.

Keywords: Morus alba; Citharexylum spinosum; Mold fungi; Edx; Sem; Elemental composition; Methanol extract.

1470. Changing Research Trends in the Field of Archaeological Wood at the Conservation Department, Faculty of Archaeology, Cairo University

Nesrin M.N. El Hadidi

Since 1980, much research in the field of treatment and conservation of archaeological wood has been carried out at the Conservation Department, Faculty of Archaeology, Cairo University. Materials and methods used in conservation have been changing gradually over the years worldwide. It was necessary to study critically previous masters and doctoral dissertations on Egyptian archaeological and historic wood, all written in Arabic.

This review of them includes a brief history of the Conservation Department at Cairo University and five main focal points of past research: types of wood used throughout Egyptian history, assessment of wood decay, wood properties and composition, treatment and conservation of decorated wood, and the evaluation of chemicals and polymers used in the treatment of archaeological wood and composite objects containing wood.

Keywords: Decay assessment; Conservation; Treatment; Archaeological wood; Cairo University.

1471. Evaluation of Sulphate Acti Vators as Consolidants for the Transformed Gypsum in Historic Stucco

Abdullah M.A. Kamel, Hassan A.H. Marie, Hala A. Mahmoud and Mona F. Ali

Stucco monuments suffer from many causes of deterioration; one of these is the transformation of the gypsum content of stucco to anhydrite, which causes disintegration and the appearance of fine fissures that sometimes culminate in the complete loss of archaeological stucco material; this problem makes thinking of a new protocol for its treatment very urgent. So the research proposes using sulphate activators, which may lead to retransformation of anhydrite to gypsum and thus will participate in protecting our stucco heritage. Many parameters have been used; including XRPD analysis, XRF, FTIR, measurement of physical and mechanical properties, SEM and aging by sodium chloride. All results proved that sulphate activator solutions have the ability to retransform anhydrite to gypsum and to increase the mechanical strength of stucco material.

Keywords: Anhydrite; Consolidant; Gypsum; Stucco; Sulphate activators.

1472. Behavior of Archaeological Paper after Cleaning by Organic Solvents Under Heat Accelerated Aging

Rushdya Rabee Ali Hassan

The main goal of this study was to study and evaluate the organic solvent on the chemical composition of aged paper samples. chemical pulp wood samples, which were, have been cleaned with three types of solvent then a Measurement of mechanical properties, Measurement of color change by spectrophotometer, PH values, X-ray diffraction and infrared spectroscopy (FTIR) study were undertaken, to see if any significant structural or chemical differences could be detected between ?untreated? and ?treated? paper. Dramatic changes in functional groups on the paper surface, as monitored by FTIR, occurred in the samples before and after solvent cleaning. Mechanical properties, however, show that ethyl alcohol, toluene and acetone may give good results in cleaning paper surface, but the solvents accelerated oxidation and hydrolysis of paper samples under heat aging are another point to consider.

Keywords: Cellulose; Mechanical properties; PH; Solvents; Accelerated aging; Color change.

1473. A "Tafsir Al Khazen" Manuscript (17[Th] Century Ad).A Technical Study

Rushdya Rabee Ali Hassan

This study focuses on using analytical techniques for identifying the components of the manuscript to explain its deterioration

process. The "Tafsir Al Khazen" manuscript, a rare manuscript of the seventeenth century, consists of paper sheets and leather bookbinding; it had been damaged by sewage water in the courtyard of the Al-Azhar mosque. Concerning measurements, we used visual assessment, pH measurements, isolation and identification of fungi, moisture content, investigation of the surface morphology by SEM, identification of pigment binder by FTIR - ATR, chemical testing of the paper components, X-ray diffraction and EDX analysis of ink and pigments X- ray diffraction analysis (XRD) for determining paper crystallinity. The results revealed that cotton fibres may have been used as raw material in the creation of paper. Alum, gelatine have been used as a sizing in paper manuscript. Goat skin was identified as the animal skin of the bookbinding, the black ink used was carbon ink, the pigments used on the paper were silver sulphide (HgS) for red colour, gold leaf for gold colour and natural ultramarine mixed with white lead for blue colour. Aspergillus sp. and Penicillium sp. were the most dominant fungi found on the manuscript. The pH of leather was higher than in normal conditions.

Keywords: Rosin; Moisture content; Sem; Amino acids; PH; Fungi; Crystallinity.

1474. investigation and Conservation of El-Shenawy Palace Photographic Collection in Mansoura, Egypt

Maha Ali, Mona Ali, Sawsan Darwish, Usama Saker, Enrico Ciliberto, Enrico Greco and Ezio Viscuzo

Paper-based photographic collections are an essential part of the Egyptian cultural heritage both for their artistic and documentary value and as a record of the history of photography, as a technique as well as a form of artistic expression. Due to their significance, the interest in photographs is growing worldwide and institutions are making great efforts to increase access to photographic collection, as well as preserve originals for future generations. The threats to photographs are many. They are very sensitive to fluctuating temperatures and relative humidity, frequent handling, air pollution, light, and improper storage and display. Unlike other paper objects, photographs have special conservation requirements due to their complex and unique nature. A private collection was selected for this study. The collection consists of five black and white photographic prints documenting one of the most valuable structures of architectural heritage in the city of El-Mansoura. This paper describes the signs of deterioration present in the collection through documenting the preservation status of El-Shenawy palace photographic collection. It also describes the conservation treatments carried out to prolong their lifespan. Prior to treatment, the photographs were characterized and studied by visual inspection, digital camera, Fourier transform infrared spectroscopy (FTIR), and X-ray photoelectron spectroscopy (XPS). Scanning electron microscope (SEM) provided with an energy dispersive X-ray spectroscopy unit was used to identify the components of the photographs, assess their preservation status, as well as study the morphology of the paper fibres in both the primary and secondary supports. Microbiological studies and pH measurements were also carried out. The results of the investigations revealed that image silver in most cases suffered from sulfiding, the secondary supports suffered from both oxidation and hydrolysis, and the gelatin

binder also showed signs of degradation. Based on the results of previous studies, the following interventive conservation procedures were selected and carried out: disinfection, cleaning, dismantlement of the secondary support, deacidification, tear mending and compensating for losses, remounting, retouching, and rehousing.

Keywords: Photographic records; Threats; FTIR; SEM; XPS; Interventive Conservation.

1475. Identification of the Byzantine Encaustic Mural Painting in Egypt

Basem Gehad, Mona Foad Aly and Hussein Marey

Encaustic painting uncovered in the hermitage of Apa Apollo at Baouit- Assuit, was studied by means of spectroscopic, chromatography as well as elemental x- ray fluorescence, the analysis re-vealed unique information's about the composition of the organic binding medium, as well as it deformation and alteration pattern. The elemental analysis highlights also the types of pigments used in the artistic palette used by the painter in order to execute his paintings. Beeswax was proved to be used, from bees which feed on sunflower, lead was the major com-ponent of the orange pigment indicating the usage of minium, arsenic sulphide mixed with hema-tite was used for the brownish red color, a copper based blue pigment, probably the Egyptian blue as well as the green earth mixed with Attachmate was also used for green colors. The results of the study gives a new information's about a unique paintings executed with a rare technique, in Egypt.

Keywords: Encaustic; Monastery; Mural painting; Byzantine; Assuit; Beeswax; FTIR; GC-MS.

1476. Analytical investigation on A Coptic,Wooden Icon from the 18Th Century Using Sem-Edx Microscopy and Ftir Spectroscopy

A. Medhat, M. Ali and M. Abdel-Ghani

in the present study, a comprehensive investigation has been undertaken into a wooden Coptic icon dated to the 18th century and painted by Ibrahim El-Nasekh. It is located in Saint Abanoub church in Samanoud, in the Nile Delta, Egypt. This study included the determination of the pigment palette, the gold layer and the white ground layer and the wooden panel. The analytical instruments used were Optical microscopy, Environmental scanning electron microscopy coupled with energy dispersive X-ray emission and Fourier transform infrared coupled with attenuated total reflectance "FTIR-ATR". The analysis revealed that the pigments used in this icon comprises indigo ($C_{16}H_{10}N_2O_2$), red lead (Pb_3O_4), white lead ($2PbCO_3 \cdot Pb(OH)_2$) and yellow lead (PbO). The gold areas were made of real gold leaves applied over an orange bole layer. The white ground layer comprises calcium sulphate dihydrate admixed with animal glue. The wooden panel was found to be made of Accacia Pennata (L.) Wild, while Cupressus sempervirens L. var. dupreziana (A. Camus) Silba was used for pegs and traverses.

Keywords: Wooden icon; Coptic; Pigments; Analysis; SEM-EDX; FTIR.

1477. Analytical investigation of Materials used in the Constructionof Islamic Mosaics in Al Sultan El Mansour Kalaoun School,Cairo, Egypt

S. Nayel and M .Ali

Egyptian Islamic Buildings are suffering from a lot of detorioration types, mainly groundwater and salt weathering which have caused the complete loss of the decorations of some of these mihrabs. Many mihrabs in egyptian islamic buildings need restoration and conservation, as islamic buildings are one of the most famouse hestorical places in egypt and over the world finding solution for this problem become very urgent. A physiochemical study using analytical techniques such as Fourier transform infrared, X-ray diffraction and scanning electron microscopy was done. This characterization study, on one hand helping us to reach for the optimum conservation and completion methods; on the other hand, the deterioration factors of mosaic were determined. All analytical methods indicated that the Al-Mansour kalaoun mosaic mihrab contains lime, Gypsum, Dolomite, Quartz, Calcite and Aragonite. It also proves that sodium chloride (halite) is the principal salt causing deterioration.
Keywords: Mosaic; Mihrab; Dolomite; Calcite; Deterioration; Construction; Analytical; Conser-vation.

1478. Geotechnical, Geophysical investigations and Seismic Response Analysis of the Underground Tombs in Mustafa Kamil Necropolis, Alexandria, Egypt

Sayed Hemeda, Kyriazis Pitilakis and Stavros Bandis

The paper presents the geotechnical, geophysical investigations and the numerical static and seismic analysis of selected underground monuments in Alexandria, Egypt i.e. the underground tombs in Mustafa Kamil Necropolis. The analysis of the static stability and the behavior of complex monuments of this kind under seismic loading, are the key factors for the efficient restoration and retrofitting of these underground monumental structures. in the present paper, we present in a first phase a comprehensible geotechnical survey undertaken in this site, comprising geophysical ambient noise measurements (microtremors), as well as field and short – long-term laboratory experiments and tests, in order to define the physical, mechanical and dynamic properties of the soils and soft rock materials. in the second stage, we present the main results of the detailed static and seismic numerical analysis of these underground monumental structures (Catacombs) using the code, PLAXIS b.v with different seismic scenarios corresponding to the seismotectonic features of Alexandria. Advanced soil-rock elastoplastic modeling has been used through out the different phases of the numerical finite element analysis. The aim of the analysis is twofold: (a) to investigate the safety margins of the existing monuments, under their present conditions, against environmental (i.e. weathering) and extreme seismic loads and (b) to investigate the potential improvement of their global behavior applying specific retrofitting techniques.
Keywords: Necropolis of Mustafa Kamil; Alexandria underground monuments; Geotechnical problems; Geotechnical investigations; Microtremors; Creep tests; Stability and seismic analysis of underground structures.

1479. Nanomaterials for the inhibition of Microbial Growth on Ancient Egyptian Funeral Masks

Fatma M. Helmi, Naglaa M. Ali and Sahar M. Ismael

Funeral masks were manufactured in ancient Egypt since several periods ago. They consist of one or more material such as wood, textile, gypsum, faience, silver and gold. They wer e exposed to microbiological infections from the surrounding environmental conditions such as fungi and bacteria, which caused various deterioration aspects : stains, disintegration, discoloration, cracking, and may promote the decay of funeral masks. in the last few years, nanoparticles have widely been used in treatment and conservation of artifacts. in this paper, the antimicrobial activities of nanomaterials silver, titanium dioxide and copper II oxide, were evaluated against the fungal strain of Asper gillus niger, Aspergillus flavus, Aspergillus fumigatus and the bacterial strain of Bacillus alvei, Gthe short Bacilli, and Gthe Bacilli spore former . Transmission electron microscope TEM, and scanning electron microscope SEM attached with energy dispersiv e X - ray spectrometer EDX unit were utilized for characterization of nanoparticles. The data showed that silver nanoparticles are the best effective one for inhibition the growth of both isolated fungi and bacteria. It was applied for treatment and conserva tion of three ancient Egyptian funeral masks in saqqara, Egypt
Keywords: Nanomaterials; Funeral masks; Biodeterioration; Microbial inhibition; Fungi; Bacteria.

Dept. of Egyptian Archaeology

1480. The Statue of 'the Doorkeeper of the Palace' *Piȝy* (Louvre E 124)

Ahmed Mohamed Mekawy Ouda

This paper presents the first publication for the inscriptions of the statue of Piȝy, perhaps from Memphis, dating probably to late Eighteenth or early Nineteenth Dynasty. The statue's owner, his titles, and status, as well as deities' epithets, are examined.
Keywords: Statue; Doorkeeper; Palace; Louvre museum.

Faculty of Graduate Studies for Education

Dept. of Curriculum and instruction

1481. Reading Sources and Academic Freedom as Determinants of Trends in English Language Teacher Research in Egypt: An interview-Based Study

Muhammad M. M. Abdel Latif

European Journal of Teacher Education, 38(2): 137-153 (2015) IF: 0.661

Little attention has been given to investigating the experiences of teacher researchers while undertaking their studies. in an attempt to explore what accounts for the stereotyped and imitative trends in the studies conducted by English language teachers in Egypt, the present study has explored how they select research topics and the factors influencing their research orientations and processes. The study used semi-structured interviews with 25 Egyptian teachers who were doing MA and Ph.D. studies in TESOL. It was found that they view good language teaching research as either testing the effectiveness of instructional techniques or evaluating textbooks, though most of them opt for experimental research due to its practical nature. The study also revealed that reading sources and academic freedom are the two main determinants of research trends in this context. Apart from the association found between the teacher researchers' perceived academic freedom and the type of literature they read, the following three other factors also accounted for the relative variance in such freedom: (a) the stage undertaken in the research, (b) the number of supervisors available or assigned and (c) the research degree registered for. The article concludes with discussing the implications of these results.
Keywords: Teacher research; Curriculum research; Teacher researcher; Research experience; Academic freedom.

Faculty of Education for Early-childhood

Dept. of Essential Sciences

1482. Numerical and Experimental Studies on Updraft Gasifier HTAG

T.M. Ismail and M. Abd El-Salam

Renewable Energy, 78: 484-497 (2015) IF: 3.476

in the present work, the performance of an updraft gasifier was investigated experimentally and numerically. This study aimed to use a two-dimensional model using a code, namely COMMENT code, to investigate the gasification and combustion processes while taking into consideration the process rate within the gasifier. in the present model the kinetic theory of granular flow (KTGF) was introduced to simulate the solid phase, while gas phase turbulence was modeled under k–? model. The predicted temperature and gas composition profiles are in good agreement with the experimental work obtained from the updraft gasifier at the Royal institute of Technology (KTH). These results show that the present model is a promising tool for simulating the gasification/combustion process of biomass within the gasifier.
Keywords: Computational fluid dynamics; Biomass; Fixed bed updraft gasifier; HTAG; Mathematical modeling.

1483. Numerical and Experimental Studies on Effects of Moisture Content on Combustion Characteristics of Simulated Municipal Solid Wastes in A Fixed Bed

Rui Sun,Tamer M. Ismail, Xiaohan Ren and M. Abd El-Salam

Waste Management, 39: 166-178 (2015) IF: 3.22

in order to reveal the features of the combustion process in the porous bed of a waste incinerator, a two-dimensional unsteady state model and experimental study were employed to investigate the combustion process in a fixed bed of municipal solid waste (MSW) on the combustion process in a fixed bed reactor. Conservation equations of the waste bed were implemented to describe the incineration process. The gas phase turbulence was modeled using the k–e turbulent model and the particle phase was modeled using the kinetic theory of granular flow. The rate of moisture evaporation, devolatilization rate, and char burnout was calculated according to the waste property characters. The simulation results were then compared with experimental data for different moisture content of MSW, which shows that the incineration process of waste in the fixed bed is reasonably simulated. The simulation results of solid temperature, gas species and process rate in the bed are accordant with experimental data. Due to the high moisture content of fuel, moisture evaporation consumes a vast amount of heat, and the evaporation takes up most of the combustion time (about 2/3 of the whole combustion process). The whole bed combustion process reduces greatly as MSW moisture content increases. The experimental and simulation results provide direction for design and optimization of the fixed bed of MSW.
Keywords: Municipal solid waste; Fixed-bed combustion; Incineration; High moisture content; Mathematical modeling.

1484. Numerical Simulation of Gas Concentration and Dioxin Formation for MSW Combustion in a fixed Bed

Rui Sun,Tamer M. Ismail, Xiaohan Ren and M. Abd El-Salam

Journal of Environmental Management, 157: 111-117 (2015) IF: 2.723

A numerical model was employed to simulate the combustion process in a fixed porous bed of municipal solid waste (MSW). Mass, momentum, energy and species conservation equations of the waste bed were set up to describe the incineration process. The rate of moisture evaporation, volatile matter devolatilization, char combustion, NOx production, and reduction and dioxin formation were calculated and established according to the local thermal conditions and waste property characteristics. Changes in the bed volume during incineration were calculated according to the reaction rate of the process. The simulation results were compared with experimental data, which shows that the incineration process of waste in the fixed bed was reasonably simulated. The simulation results of weight loss and solid temperature in the bed agree with the experimental data, which shows that the waste combustion rate is nearly constant in the middle of the incineration process, and that moisture evaporation takes up most of the time for the overall incineration experiment. The emission of gas species from the bed surface is also agreeably simulated, with O2, CO2, and CO concentrations in flue gas agreeing with the experimental data. The simulation

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results benefit the understanding of the combustion process in the waste bed as well as the design of incinerator grates.

Keywords: Waste incineration; Municipal solid waste; Numerical simulation models; Fixed bed; Dioxin formation.

Ethiopia's destination to increase the tourism contribution in the local economy; income and employment opportunities.

Keywords: Tourism Management; Economies of Tourism; World Heritage Sites; Economic Development ;Mali; Ethiopia.

Institute of African Research and Studies

Dept. of Natural Resources

1485. Synergistic Effect of Nisin and Cinnamaldehyde Against Alicyclobacillus Acidoterrestris in Orange Nectar

Abd El- Rahman M Khallaf- Allah, Hassan M Sobhy, Mostafa Taha M Assous, Mohamed Said Abbas and Amani Mahmoud Ibrahim

Research Journal of Pharmaceutical, Biological And Chemical Sciences, 6 (1): 61-72 (2015)

The present study was undertaken to evaluate the effect of nisin and cinnamaldehyde alone and in combination on the D-values of Alicyclobacillus acidoterrestrisspores using different temperatures. The effect of sublethal concentration of antimicrobials, on D values were selected to be applied in both pasteurized and unpasteurized orange nectar stored at temperature (25-45 °C). Cinnamaldehyde effectiveness was dose dependent showing the sharper decrease in D-values (7-1.7) min at (90-95°C) respectively using 0.5 µl/ml of cinnamaldehyde .While, nisin displayed a reduction in D-values (9.2-3.6) min at (90–95° C), respectively using 62.5 IU/ml above which no significant decrease was recorded. Their combination revealed the most pronounced decrease in the D-values (7.65-3.8) min at (90 –95° C) using 0. 26 µl/ml and 31.25 IU/ml of cinnamaldehyde and nisin, respectively. Where the combination(46.8 IU.ml-1/0.39 µl.ml-1) of nisin/cinnamaldehyde was potential in extending the shelf of pasteurized orange nectar stored at 45° C to the 33th day compared to the unpasteurized nectar to the 21 th day at the same temperature of storage. While, the synergistic effect of this combination help in extending the shelf life , at 25° C of storage to 45 th day in pasteurized orange nectar compared to the unpasteurized nectar to 27 th day of storage.

Keywords: Alicyclobacillus acidoterrestris; Synergistic; Orange nectar; Nisin; Cinnamaldehyde.

Dept. of Political and Economical Systems

1486. Tourism Management In World Heritage Sites And Its Impact On Economic Development In Mali And Ethiopia

Sally Mohamed Farid

Procedia Social And Behavioral Sciences, 211: 595-604 (2015)

This paper discusses tourism management in World Heritage sites and the impact of tourism on economic development using case studies of some African countries as Mali and Ethiopia. The results indicate that there is an affirmative relation between the presence of heritage sites and the amount of tourists. In Mali the local population plays a key role and benefits of cultural tourism through the deployment of the cultural capital and embodied it. In Ethiopia there is a need for improving the competitiveness of

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