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Posters

Kejlová Kristina et al., Toxicol Open Access 2017, 3:1 (Suppl)
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Hazard identification in newly developed antimicrobials

Kejlová Kristina, Bendová Hana, Sosnovcová Jitka, Chrz Jan and Dvořáková Markéta
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Protection of consumer products such as food contact plastics, coatings, cosmetics and textiles against undesirable microbial attack requires innovative agents with a wide spectrum of efficiency, long term stability and safety of use. These requirements are often difficult to meet when using current biocides and antimicrobials. The aim of the currently performed research project ALTERBIO is to identify and select innovative and efficient antimicrobial agents, based on silver nanoparticles and photoactive phthalocyanine derivatives, able of covalent or ionic bond within a polymeric system and without undesirable effects on human health and the environment. Within the project, the promising agents with proved efficient and stable antimicrobial effects need to be subjected to a battery of toxicological tests to avoid local and systemic toxicity hazard. The battery of toxicological test to identify local toxicity includes namely skin and eye irritation/corrosion, phototoxicity and skin penetration. The basic systemic toxicity tests comprise acute toxicity, genotoxicity, skin sensitization and endocrine disruption. In compliance with the current European legislation restricting the use of experimental animals the toxicological methods employed in the project comprise exclusively *in vitro* procedures based on cellular and tissue models either of human origin or mimicking human tissues. The presented poster summarizes the available methods and obtained results.

Biography

Kejlová Kristina graduated from the Charles University in Prague and received her PhD at the Palacký University in Olomouc. She works as the Head of Unit for Alternative Toxicological Methods at the National Institute of Public Health in Prague, Czech Republic. She is an OECD and EURL-ECVAM expert for *in vitro* methods. She has published more than 50 papers as author/co-author of reputed journals.

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Bendová Hana et al., Toxicol Open Access 2017, 3:1 (Suppl)
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Microbiological efficacy of food contact materials

Bendová Hana, Sosnovcová Jitka, Vrtalová Martina, Vrkoslavová Jana and **Jirova Dagmar**
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In the scope of the currently performed grant project ALTERBIO, plastic products with antimicrobial agents integrated into a polymeric matrix, intended e.g. as food contact materials, were tested by means of microbiological tests for antibacterial activity. The tested samples comprised source materials (e.g. foils, plastics) and finished products (tableware). Metal ions, including silver and tartaric acid in concentrations 0.8%-1.0% were chosen as antimicrobial agents bound in various polymers. The methods used included microbiological tests for determining the biocidal/biostatic efficacy of preservatives against bacterial growth. Strains of Gram+ bacteria (*Staphylococcus aureus*, ATCC 6538P) and Gram- bacteria (*Escherichia coli*, ATCC 8739) were obtained from the Collection of Microorganisms, Brno, Czech Republic. Measurement of antibacterial activity on plastic surfaces was performed using methods according to International standard ISO 22196:2011 Measurement of antibacterial activity on plastics and other non-porous surfaces. The methods were modified and optimized with respect to the type of finishing material surface (hydrophobic, hydrophilic). The promising samples of developed materials with stable antimicrobial efficiency have to be further tested as food contact materials which must comply with the general requirements set by the EU Framework Regulation No. 1935/2004 on materials and articles intended to come into contact with foods. The final articles/products under normal and foreseeable conditions of use should not transfer their constituents into foodstuffs in quantities, which could endanger human health, bring about an unacceptable change in the composition of the foodstuffs or cause deterioration in their organoleptic characteristics.

Biography

Bendová Hana has completed her graduation from the Charles University in Prague and received her PhD from the Palacký University in Olomouc. Her professional specialization is Dermatotoxicology, focused on safety and efficacy assessment of cosmetics and other consumer products. She works as the Head of Biomedical Unit at the National Institute of Public Health in Prague, Czech Republic. She has published more than 20 papers in reputed journals.

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Seyedehparvin Khazraei, Toxicol Open Access 2017, 3:1 (Suppl)
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Stem-cell-based, tissue engineered tracheal transplantation in mustard gas exposed patients suffering from tracheomalacia

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Statement of the Problem: Mustard gas (bis (2-chloroethyl) sulfide) is a chemical weapon which was used in World War 1 for the first time. The exposed victims of Mustard gas suffer from severe respiratory difficulties; such as, chronic cough, paroxysmal dyspnea, asthma like attack and opportunistic respiratory system infections. Palliative therapies such as, anti-inflammatory drugs, broncholytics, long acting B2 agonists, inhaled corticosteroid and proton pump inhibitor are the current choices of treatment; however, desensitization of beta adrenergic receptors and refractory Gastroesophageal Reflux Disease (GERD) are causes expressed for the inefficacy of these treatments.

Methodology & Theoretical Orientation: Chest high resolution computed tomography of these patients illustrates the high prevalence of air trapping which is due to tracheomalacia. Suggesting that the reason for inefficacy of current treatments is not as simply as GERD or desensitization of beta adrenergic receptors; and structural damages are responsible for severe respiratory complications. There are several successful case reports in the field of air way transplantation who suffered from large airways structural abnormalities based on different pathologies; they recovered their health after air way transplantation with stem cell based bio artificial graft.

Conclusion & Significance: Theoretically, it seems that stem cell based tracheobronchial reconstruction can be beneficial treatments for patients who suffer from severe respiratory difficulties and tracheomalacia due to Mustard gas exposure.

Biography

Seyedehparvin Khazraei is a final-year Medical Student at Shiraz University of Medical Sciences. She is currently working as a Medical Intern and will receive her Doctor of Medicine degree in 2017. Seven years ago, when she just started medical school her dream was to help patients as a Doctor in the hospital but gradually she learned that she will be more successful and happier if she focuses on research. This way she believes she can even inspire more people and contribute to science. Her field of interest is Toxicology and she has a great passion for performing researches on the patients, suffering from gas and chemical exposure.

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Ansam J Altelchy et al., Toxicol Open Access 2017, 3:1 (Suppl)
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The efficacy of Doxocycline, Rousovastatine and Spironolactone on cardiotoxic effect of Doxorubicin in female Albino rats

Ansam J Altelchy and **Ansam N Al-Hassani**
Hawler Medical University, Iraq

Background & Aim: Cardiotoxicity that is caused by chemotherapy is a devastating disorder that impairs the ability of the heart to respond to physiological demands for increased cardiac output that may result in heart failure. This led to the attempt of evaluating the efficacy of Doxycycline, Rosuvastatin and Spironolacton in Doxorubicin induced cardiotoxicity. The aims of this study are to assess the ability of these drugs to attenuate Doxorubicin induced heart failure in rats and to compare among them regarding their ability to cause remarkable structural, biochemical, and histopathological changes that preserve normal cardiac function.

Methods: 46 female Albino rats, 8-12 weeks old, weighing 140-200 grams were used in the study. The animals were housed in groups of 8 and 10 per cage, on sawdust in the animal house facility, under conditions of controlled ambient temperature of 22-25°C with a 12 hour light/ dark cycles. The animals were supplied with rodent chow and free access to tap water. They were divided in to 3 groups. The control group which included 8 rats, Doxorubicin group, included 8 rats and treatment group, each included 10 rats. All groups were treated for a period of 4 weeks. Mean serum (BNP), (CgA), (TC), (HDL), (LDL), (TG) and (UA) levels, in addition to the histopathological studies, are the estimated parameters used in this study.

Results: All drugs used in the treatment group showed a degree of cardioprotection effect against Doxorubicin induced cardiotoxicity, and caused a significant reduction in mean serum BNP, CgA, total cholesterol, TG, LDL, and uric acid levels and increment in HDL as compared with Doxo group. While Spironolactone appeared to be inferior in amelioration the parameters that accompanied with cardiac toxicity was induced by Doxorubicin, than the other drugs in the treatment group. In conclusion, Rosuvastatine appeared to be the most beneficial in amelioration of Doxorubicin induced cardiac toxicity.

Biography

Ansam J Altelchy has finished her BSc Pharmacy in 2010. She has embarked on experiential job as a rotational Clinical Pharmacist at different hospitals. After one year of training and gaining experience, she was offered by Hawler Medical University to be a Demonstrator in pharmaceutical labs. She has obtained MSc degree in 2015 from Hawler Medical University- College of Pharmacy. She is currently holding a post of Assistant Lecturer in the Pharmacology and Toxicology Dept. in the same University and is interested in pursuing PhD in the near future.

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Nadjia Bekkari et al., Toxicol Open Access 2017, 3:1 (Suppl)
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Cytotoxic effects of *Androctonus australis hector* venom on the isolated liver

Nadjia Bekkari and **Fatima Laraba Djebari**
University of Science and Technology Houari Boumediene, Algeria

Background: *Androctonus australis hector* (*Aah*) venom is well known by its high toxicity and when injected to animals, is able to induce several symptoms starting by affecting cardiovascular dysfunctions, respiratory distress and tissue alterations such as hepatic damages and acute inflammatory. These symptoms were related to the massive release of neurotransmitters after neurotoxins binding on the ionic channels of peripheral nervous system.

Methods: In this study, we focus on the liver as probable direct target for *Aah* venom. Venom was administrated into isolated liver. Tissue explant culture was used to quantify MPO and complement activities, the evaluation of oxidative status and histological analysis were also carried.

Results: Results showed that the *Aah* venom induces several alterations and injuries. An unbalance of oxidative status is expressed by the reduction of NO level and an increase of both MDA and GSH levels and the catalase activity. Inflammatory cell hyperplasia was observed on the histological micrographies and associated with an increase of MPO and complement system activities. Histological analysis also revealed apparition of necrosis areas.

Conclusion: These results indicate that *Aah* venom has cytotoxic effect on the isolated liver which is not related to neurotransmitters or other systemic mediators released during scorpion envenoming. It seems that *Aah* venom contains some bioactive components other than neurotoxins which could have direct target in this tissue.

Biography

Nadjia Bekkari has completed her PhD from USTHB University. She is member of research staff which work on venoms (snake and scorpion) under the direction of Pr Laraba-Djebari Fatima. She has published 2 papers in reputed journals.

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Jai-Sing Yang, Toxicol Open Access 2017, 3:1 (Suppl)
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Novel quinolone derivatives compound (NQDC) induced autophagic and apoptotic cell death in 5FU-resistant HT29 cells

Jai-Sing Yang
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In this study, novel quinolone derivatives compound (NQDC) suppressed viability in 5FU-resistant HT29 cells through inhibiting cell proliferation, causing cell cycle arrest and triggering apoptosis. In this study, we investigated the oral anti-cancer activity of NQDC and its mechanism in 5FU-resistant human colon cancer cells. Our results demonstrated that NQDC had an extremely low toxicity in normal oral cells and provoked autophagic cell death to form AVOs and autophagic vacuoles in 5FU-resistant HT29 cells by AO and MDC staining. DNA fragmentation and condensation occurred in NQDC-triggered 5FU-resistant HT29 cell apoptosis. Colorimetric assay analyses also showed that activities of caspase-3 and caspase-9 occurred in NQDC-treated 5FU-resistant HT29 cells. Overall, our findings indicate that NQDC is likely to induce autophagic and apoptotic death in 5FU-resistant HT29 cells.

Biography

Jai-Sing Yang is a Research Fellow at Department of Medical Research, China Medical University Hospital, China Medical University, Taiwan. His main research interests include exploring molecular mechanisms of herbal medicine and new drugs against cancer development. He has set up the research platform, mainly combining molecular pharmacology, immuno-pharmacology, cell biology, drug delivery, nano-technology, animal models and bio-informatics for screening anti-cancer activities of herbal products or newly synthetic drugs. He focuses his work on the development of natural products, traditional Chinese medicine (TCM), drug-loaded nanoparticles and the synthesis of new compounds against different types of cancers.

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Je-Wei Tsao et al., Toxicol Open Access 2017, 3:1 (Suppl)
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Novel quinazoline compound-induced apoptotic cell death in 5FU-resistant HT29 cells

Je-Wei Tsao, Mann-Jen Hour and **Jai-Sing Yang**
China Medical University, Taiwan

In this study, Novel Quinazoline Compound (NQC) suppressed viability in 5FU-resistant HT29 cells through inhibiting cell proliferation, causing cell cycle arrest and triggering apoptosis. Flow cytometry analysis revealed that NQC caused 5FU-resistant HT29 cell cycle arrest at G2/M phase and increased the proportion of polyploidy cells. Western blotting indicated that the expression of cyclin B1, p-Cdk1 and Cdk1 increased after treatment with NQC. Colorimetric assay analyses also showed that activities of caspase-3, caspase-8 and caspase-9 occurred in NQC-treated 5FU-resistant HT29 cells. Together, these results suggest that NQC inhibited 5FU-resistant HT29 cells growth through inducing mitotic catastrophe by interference with G2/M cell cycle checkpoint which may open a new avenue for the treatment of 5FU-resistant colon cells.

Biography

Je-Wei Tsao is a Research Assistant of Department of Medical Research, China Medical University Hospital, China Medical University, Taiwan. His main research interests are exploring molecular mechanisms of Herbal Medicine and new drugs against cancer development.

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Chingju Lin et al., Toxicol Open Access 2017, 3:1 (Suppl)
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Anti-neuroinflammation of brain-derived neurotrophic factor in microglia

Chingju Lin, Sheng-Wei Lai, Cheng-Fan Tsai and **Dah-Yuu Lu**
China Medical University, Taiwan

In the Central Nervous System (CNS), microglia plays a crucial role in innate immune processes. The hallmark of neuroinflammation is considered to be microglial activation that leads to the production of excessive proinflammatory molecules. Hence, inhibition effects on microglial over-activation are major strategy to counter balance neurodegenerative progression. Brain-derived neurotrophic factor (BDNF) is one of the major neurotrophic factors to maintain development and survival of neurons in the brain. However, how BDNF signalling participates in modulating neuroinflammatory responses remains unknown. Recent studies have shown that BDNF is produced by astrocytes. Here, we reported experiments using supplements with exogenous BDNF to examine the neuroprotective effects. BDNF causes decrease of cyclooxygenase-2 (COX-2) as well as numerous proinflammatory cytokines. We found that BDNF resulted in increased expression of erythropoietin (EPO) and sonic hedgehog (Shh) in microglia, this result causes further inhibition of inflammation effect. In addition, astrocyte also acts through the endogenous mechanism to regulate microglia by increasing neuroprotective factor. The phosphorylated adenosine monophosphate-activated protein kinase (AMPK)-α was mediating anti-neuroinflammatory responses in microglia. In this study we provide the BDNF-EPO-Shh novel-signalling pathway involved in anti-inflammatory response via astrocyte-microglia endogenous regulation.

Biography

Chingju Lin is an Associate Professor at the Department of Physiology at China Medical University, Taichung, Taiwan. In recent years, neuroinflammation has been reported to be associated with the pathogenesis of neurodegeneration diseases. Her research interests focus on studying the relationship between neuroinflammation and neurodegeneration. She is also interested in investigating Chinese herbal compounds or chemicals exerting anti-inflammation effects and their potentials to be therapeutic drugs in treating neurodegeneration diseases.

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Miau-Rong Lee et al., Toxicol Open Access 2017, 3:1 (Suppl)
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YC-1, soluble guanylate cyclase stimulator, induces G0/G1 arrest and apoptotic cell death in Cisplatin-resistant human oral cancer CAR cells

Miau-Rong Lee, Meng-Wei Lin and **Jai-Sing Yang**
China Medical University, Taiwan

In this study, YC-1, a soluble guanylate cyclase stimulator, suppressed viability in Cisplatin-resistant human oral cancer CAR cells via inhibiting cell proliferation, G0/G1 phase arrest and triggering apoptosis. Results from flow cytometry analysis indicated that YC-1 promoted G0/G1 phase arrest and provoked apoptosis in CAR cells. YC-1 treatment up-regulated p21 and down-regulated cyclin A, D, E, CDK2 and protein expression. YC-1 caused apoptotic cell death and DNA fragmentation evidenced by DAPI/TUNEL staining. YC-1 time-dependently disrupted the mitochondrial membrane potential ($\Delta\Psi m$). It enhanced the protein levels of cytochrome c, Bax, Bak as well as attenuated Bcl-2 expression in CAR cells. Our results support the potentially therapeutic application of YC-1 in drug resistant oral cancer in the future.

Biography

Miau-Rong Lee has dedicated 25 years to basic Life Science Education. She was involved in the cross discipline education program sponsored by the Ministry of Education of the Republic of China (Taiwan). Her main research interests include exploring molecular mechanisms of herbal medicine and synthetic compounds on immunomodulation and anti-cancer effects.

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Polyphenol resveratrol triggers Cisplatin-resistant human oral cancer CAR cell autophagy and apoptosis

Chi-Cheng Lu, Chao-Hsiang Chang and Jai-Sing Yang
China Medical University, Taiwan

Resveratrol is known to be an effective chemopreventive agent against multiple tumor cells, but the increasing drug resistance avoids the cancer treatment in oral cavity cancer. In the current study, we investigated the oral anti-tumor activity of resveratrol and its underlying mechanism in Cisplatin-resistant oral cancer CAR cells. Our results demonstrated that resveratrol provoked autophagic cell death to form AVOs and autophagic vacuoles in CAR cells by acridine orange (AO) and monodansylcadaverine (MDC) staining. Inhibitors of PI3K class III (3-MA) and AMP-activated protein kinase (AMPK) (compound c) suppressed the autophagic vesicle formation, LC3-II protein levels and autophagy induced by resveratrol. Z-VAD-FMK (pan-caspase inhibitor) attenuated resveratrol-triggered cleaved caspase-9, cleaved caspase-3 and cell apoptosis. Resveratrol also enhanced phosphorylation of AMPK and regulated autophagy- and pro-apoptosis-related signals in resveratrol-treated CAR cells. Our results indicated that resveratrol is likely to induce autophagic and apoptotic death in drug-resistant oral cancer cells and might become a new approach for oral cancer treatment in the near future.

Biography

Chi-Cheng Lu completed his Graduation and Doctorate from National Chung Hsing University (NCHU), Taichung, Taiwan. He worked at the Department of Food Science and Biotechnology of NCHU as a Post-doctoral Fellow under Chair Professor Gow-Chin Yen. He then worked with Research Fellow Dr Jai-Sing Yang of China Medical University Hospital (Taiwan) as a Post-doctoral Research and Project Scientist. His specific interests are focused on targeting tumor cell demise (apoptosis, autophagy and necrosis) and anti-metastatic effect *in vitro* and *in vivo* after exposure to phytochemicals and the synthesis of novel compounds. He has also undertaken oxidative stress and functional food research in recent years and is exploring their molecular mechanisms.

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Jo-Hua Chiang et al., Toxicol Open Access 2017, 3:1 (Suppl)
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Allyl isothiocyanate induces apoptotic mechanism via endoplasmic reticulum stress and mitochondrial pathway in human colorectal cancer HT29 cells

Jo-Hua Chiang[1], **Chi-Cheng Lu**[2] and **Jai-Sing Yang**[2]
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Allyl isothiocyanate (AITC), one of isothiocyanate (ITC) family found in a constituent of cruciferous vegetables, has chemopreventive and antitumor activities in several cancers. However, no available information showed antitumor effects on human colorectal cancer cells. The current study was focused to explore mechanisms underlying AITC-induced apoptosis in human colorectal cancer HT29 cells. The results showed that AITC reduced cell number and viability using trypan blue stain by countess automated cell counter as well as utilizing MTT assay, respectively. AITC also was observed to induce apoptotic cell morphological changes by a contrast-phase microscope and cell cycle arrest at G2/M phase by flow cytometric assay in HT29 cells. Intrinsic apoptosis-associated factors such as caspase-9 and caspase-3 activities were performed. The levels of reactive oxygen species (ROS) production, release of cytosolic Ca^{2+}, loss of mitochondrial membrane potential ($\Delta\Psi m$) occurred in AITC-treated HT29 cells. AITC stimulated mitochondria-related signaling, including cytochrome c, Apaf-1, AIF and Endo G in HT29 cells. We further found that calpain 1, ATF-6α, GRP78, GRP94, GADD153 and capase-4 signals were up-regulated in HT29 cells after AITC challenge. Importantly, NAC (an ROS scavenger) and BAPTA (a selective Ca^{2+} chelator) abolished AITC-reduced viability in HT29 cells. Additionally, AITC down-regulated CDK1 activity and altered the expressions of G2/M phase-modulated associated protein levels by Western blotting in HT29 cells. Therefore, our findings demonstrated AITC can promote G2/M phase arrest and trigger HT29 cell apoptosis through ER stress and mitochondria-dependent pathway. AITC possibly exhibits as a potential anticancer agent and could be applied in the treatment of human colorectal cancer.

Biography

Jo-Hua Chiang received her PhD degree in Life Sciences at National Chung Hsing University (NCHU), Taichung, Taiwan. She then worked as a Post-doctoral Fellow with distinguished chair Professor Tian-Shung Wu of the Department of Chemistry, National Cheng Kung University, Tainan, Taiwan. She is currently an Assistant Professor at the Department of Nursing, Chung-Jen Junior College of Nursing, Health Sciences and Management, Chiayi County, Taiwan. She has worked in the area of anticancer molecular signaling. Her fields of interest include phytochemicals, herbal medicine and the synthesis of novel compounds against multiple cancer cells and antiangiogenic actions *in vitro* and *in vivo*.

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Zeynep Ateş-Alagöz et al., Toxicol Open Access 2017, 3:1 (Suppl)
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Syntheses and antioxidant activity of novel pyrrol-benzoimidazole derivatives

Zeynep Ateş-Alagöz, Fikriye Zengin, Rahman Başaran and **Benay Can-Eke**
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The antioxidants and antioxidant enzyme systems belong to the major protective systems of the organism. Both pyrroles and benzimidazoles exhibit different important biological activities, like antibacterial, antioxidant, cytotoxic properties. For this reason, novel pyrrole-benzimidazole derivatives were designed and synthesized to perform their antioxidant activity. Syntheses of the compounds were carried out starting from commercially available aryl sulfonyl chlorides. Alkylation of the sulfonyl chlorides with iodoethane or iodomethane in the presence of tellurium, rongalite and 1 M aqueous sodium hydroxide gave ethylsulfonyl/methylsulfonyl derivatives. This was followed by reaction with conc. H2SO4 and potassium nitrate to give nitro intermediates. Nucleophilic displacement of the chloro group with several amines in N, N-dimethylformamide and their reduction with hydrogen gas by using palladium carbon and condensation of these derivatives with 1H-pyrrole-2-carbaldehyde gave the targeted pyrrole-benzimidazoles. Purity control and structural elucidation were controlled by using elemental analyzer and H, C-NMR, Mass spectrometers, respectively. Their *in vitro* effects on rat liver microsomal NADPH-dependent lipid peroxidation (LP) levels and ethoxyresorufin O-deethylase (EROD) activity were determined. All synthesized compounds showed moderate activity on LP levels when compared with BHT. Compounds 1-7 displayed strong inhibitory activity on LP and inhibition rate was 77-65%. However, no significant inhibitory effect was obtained on EROD activity.

Biography

Zeynep Ates-Alagoz usually performs the organic synthesis work. Her research interests are in the area of drug discovery focusing on both organic synthesis and structure-activity relationships. She has synthesized novel compounds having indole/benzimidazole/thiazolidinedione ring systems and has evaluated their antioxidant, antimicrobial and anticancer activities. She has also conducted structure-activity studies of retinoidal and melatonergic compounds. Currently, she is working on several projects including syntheses of novel NMDA receptor antagonists for treatment of Alzheimer's disease, and syntheses of novel radiosensitizers for anticancer activity and small molecules for antioxidant activity.

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Determination of Bromate, Perchlorate and selected ions in drinking water supplies in Qatar

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About 99% of the potable water used in Qatar is desalinated and Qataris spend approximately 15 million dollars in importing bottled water (90 million L), as the public thinks it is of better quality than the tap water. Since both tap and bottled water are stored in plastics, there are certain factors (e.g. temperature and UV light) which might affect their quality. Till now, there is no study available on the quality of drinking water in Qatar. This study is focused on analyzing the selected ions along with the toxic Bromate and Perchlorate ions in tap water collected from different locations in Qatar and five commonly consumed bottled water brands. The water samples were analyzed using the Dionex Ion Chromatography ICS 5000+. The concentrations of selected ions (ammonium, bromide, calcium, chloride, fluoride, lithium, magnesium, nitrate, nitrite, potassium, sodium and sulfate) were found to be below the set standard levels. The toxic Bromate and Perchlorate were not detected in any of the water samples tested in this study. However, the concentration of phosphate ions in all tap water and 5 bottled water brands ranged from 0.37-0.69 ppm which is above the standard (0.1 ppm) set by the Water Authority in Qatar, indicating that phosphates might have been added to drinking water to avoid corrosion in pipes. In conclusion, both tap water and bottled water brands studied are safe for consumption with respect to all ions. However, more research needs to be carried out to collect samples from the same locations during different times of the year to determine the impact of environmental factors on the formation of toxic Bromates and Perchlorates. Additionally, the public in Qatar should be encouraged to drink tap water since its quality is very much comparable to the bottled water, in contrast to their beliefs.

Biography

Sabah Mariyam is a Bachelor's student of Environmental Sciences Program at the Department of Biological and Environmental Sciences, College of Arts and Sciences, Qatar University. Her graduation project, funded by Qatar University Student grant, focuses on the quality of drinking water supplies in Qatar and this abstract is part of that project. She aims to encourage and change the general public perceptions on tap water quality in Qatar. She will be pursuing her Master's degree in Environmental Sciences upon graduation.

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Evaluation of microbial quality of ready-to-eat foods sold in Doha, Qatar

Shifa Zuhara and **Ipek Goktepe**
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Food safety is an integral part of environmental public health. According to Kunová *et al.* (2015), there has been many reports on ready-to-eat foods (RTEF) being the basis for foodborne outbreaks in recent years. In Qatar, 5.4% of the total communicable diseases reported from 2008 to 2011 were due to foodborne disease (SCH, 2013). There is very limited information regarding the microbial quality of food sold in mainly fast-food restaurants and cafeterias in Qatar. Therefore, this preliminary study was carried out to evaluate the microbial quality of ready-to-eat foods sold in selected food establishments in Qatar. Chicken and burger sandwiches and green salads were collected on a monthly basis from selected cafeterias and fast-food restaurants. The total aerobic, coliform, *Salmonella* spp., and Listeria spp. counts were determined using plate count agar (PCA), MacConkey Agar (MCA), Violet Red Bile Agar (VRBA), Listeria Selective Agar (LSA), respectively. The results indicated that the APC counts of the chicken and burger sandwiches were considered unsatisfactory since their counts were above the set international standards. For instance, the average total aerobic microorganism count for burger sandwich was 7.13 Log_{10} CFU/g, which is much higher than the safety guideline set at ≥5 Log_{10} CFU/g. Additionally, the total aerobic counts of green salads were determined to be 7.24 log_{10} CFU/g which is higher than the set guideline of 6 Log_{10} CFU/g. The total counts were ≥7 Log_{10} CFU/g for *Salmonella* spp., coliform, and Listeria spp. which are also considered to be unsatisfactory levels. These results demonstrate that it is necessary to improve awareness on food handling and sanitation practices applied in these restaurants to avoid any future foodborne outbreak.

Biography

Shifa Zuhara is a Senior Undergraduate Student of Environmental Sciences Program in the Department of Biological and Environmental Sciences, College of Arts and Sciences at Qatar University. She is currently working on her graduation project dealing with evaluating the microbial quality of ready-to-eat foods sold in Doha, Qatar.

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Naif Arab University for Security Sciences efforts in the field of forensic science

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Unique Forensic Sciences importance and specificity in the field of security in general, and to the judicial bodies, in particular, because they help to identify the perpetrator of the crime and bring all the evidence irrefutable evidence required to prove the commission of the crime and pay for the recognition of what he had done a criminal act. During the past years has made the Naif Arab University for Security Sciences (NAUSS) active steps in the field of security, criminal , social sciences, and legal legitimacy …etc , under the able leadership and massive support from His Excellency the President of the University, and HE agents University, under the guidance and follow-up of His Royal Highness the Crown Prince, Canine First Prime Prime Minister and Interior Minister Prince Mohammed bin Nayef bin Abdulaziz. It has put her best possibilities to achieve its fundamental objectives, as well as to move forward to meet new challenges in the field of scientific research and the prevention of crime in the Arab world. University is always keen to implement training programs Applied scientifically and practically level that meets the needs of the Arab security through its faculties, departments and centers and can be supplied with all the means and tools. The College of Forensic Sciences, is one of those colleges that UNU is striving to make this college a unique model in the Arab world, and leading educational institution and most inspiring to provide a high degree of education and vocational training in various disciplines in forensic science. At the same time, we would like to extend our services outside the territorial boundaries, and put ourselves as an institution with an international reputation and credibility in the field of criminal sciences. The College of Forensic Sciences, formerly known as the Laboratory of Forensic Sciences known, was established in 2003, the main objective of improving the quality of the practice of forensic science in the Arab world by providing a high level of education and vocational training in various disciplines of Criminal Sciences.

It will be through this review to give full information about all the courses, seminars, workshops, conferences and programs held by the university in the field of forensic science, as well as data numbers of participants and the countries that follow them, in addition to the university's plans and aspirations over the next ten years.

Biography

Mohammed Al-Saad is the Dean of the College of forensic Sciences, Naif Arab University for Security Sciences (NAUSS)- he has expertise in the organic synthesis, identification and investigation of toxic material. He has attended many scientific international conferences, and selected by many international conferences committees for many awards. He has a many years of experience in research, teaching.

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Aberrations in Chironomidae (Diptera) genomes induced by various environmental stress factors

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Chironomids represent one of the most important groups of aquatic invertebrates. The larvae and pupae of most species of chironomids occur in freshwater, though they are also prevalent in marine, brackish water and terrestrial habitats. In many aquatic habitats this group constitutes more than half of the total number of macro-invertebrate species present. As it is the invertebrates are known to be an appropriate tool for assessment of the state of aquatic ecosystems. The larvae display exceptionally wide range of sensitivity to environmental parameters such as DO, pH, salinity, substrate, and pollution by organic wastes, heavy metals and contaminants, and also play an important role in indicating radioactive pollution. The chironomid larvae form an integral link in aquatic food chain and constitute a biological connection between aquatic and terrestrial habitat and ostensibly human is intimately linked to these systems. In particular *Chironomus plumosus*, the most favored chironomid is generally chosen for the following reasons: It possesses a low diploid chromosome set (2n=8), the salivary polytene chromosomes have a distinct and well described band structure which permits detailed analysis of structural and functional aberrations and chromosomes I, II and III contain well-expressed nucleolar organizers (NORs) and well-developed Balbiani rings (BR1 and BR2) are present in chromosome G. NOR and BRs are known to be very sensitive to stress and could be used as good model to examine the genotoxicity of pollutants. The polytene chromosomes present in the salivary glands of chironomids have been extremely important in cytogenetics for two main reasons. On one hand, studies of their detailed structure and especially of the DNA replication and the puffing phenomenon have led to new insights on fundamental problems such as the nature and mode of action of genes. On the other hand, comparisons of banding sequences of different individuals, populations and species have been of great significance in the analysis of evolutionary cytogenetic processes. The chromosomal changes such as inversions, deletions, translocations etc. can be well studied in polytene chromosomes because of their large size, since any structural rearrangement is expressed in corresponding alteration in somatic synapsis. The band pattern is species specific, therefore, any chromosomal change that brings about a change from standard arrangement of bands, leads to speciation. The present study could be used as cost-effective and sensitive test for detecting a range of genotoxic agents and studying their impact on the genome under natural environmental conditions.

Biography

Pragya Khanna has 17 years of research experience on cytology of chironomids and environmental assessment of major and minor water bodies of Jammu region with special reference to heavy metals, pesticides and industrial effluents. She has worked on a number of projects funded by DST and UGC on the above mentioned aspects. She has over 40 research papers, more than 1500 popular articles published in local newspapers, magazines and websites, 4 books and 5 monographs to her credit. She has been awarded 16 times by different scientific, academic and allied agencies/societies for her research/scholastic work at state and national levels.

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Environmental trigger factors associated with migraine in the population of Jammu region of J&K State (India)

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Migraine is an episodic neurovascular disorder that is associated with significant unilateral head pain, non-productivity at workplace and reduced quality of life. Its cause is both genetic and environmental; therefore, it is regarded as a multi-factorial neurological disorder, which involves an interaction of genetic and environmental risk factors for its development. Migraine can be triggered by a number of extrinsic and intrinsic factors such as stress, fasting, sleep disturbances, bright lights etc. The present study has been taken up to evaluate the different factors that trigger migraine in the population of Jammu region of J&K State. A total of 102 migraine patients were enrolled for the investigation of different migraine triggers. Noise, stress, physical exhaustion (tiredness), travelling, sleep disturbances, change of weather, fasting, odours and pollution were the leading migraine triggers found in the present study. In migraine management, trigger factors are crucial because their avoidance may result in a better control of the disease.

Biography

Parvinder Kumar is working as a Senior Assistant Professor in the Department of Zoology. In addition to this, he is associated with Human Genetic Research cum Counselling Centre since its inception. He is involved in the research and diagnosis of human genetic diseases. He has 32 publications and two awards.

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Phytofabrication of silver nanomedicine: An approach to overcome hepatocellular ailments

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Statement of the Problem: Nanomedicine research is currently an area of adoring scientific curiosity due to its wide variety of potential application in therapeutic and biomedical interest. In the present study, *Morus alba* L. leaves were used as reducing agents to prepare a silver nanomedicine with an aim to enhance the preventive efficacy of bioactive compounds present in these leaves for the treatment of hepatic ailment in rats.

Methodology & Theoretical Orientation: Hepatotoxicity in albino rats was induced by intraperitoneal injection of N-nitrosodiethylamine and was treated with different doses of silver nanomedicine to find nanodrug. After the experimental period, blood and liver samples were collected from dissected animals, for haematological and biochemical analysis. The levels of oxidative markers, antioxidant status and inflammatory markers were estimated in serum and tissue homogenates whereas histopathological observations were assessed in the tissue of control and experimental animals.

Findings: The administration of NDEA showed significant rise in the above biochemical parameters, whereas the levels of enzymatic antioxidants were decreased. Obtained results demonstrated that the screening of biologically synthesised AgNPs at different doses reverse the elevated levels of these enzymes significantly towards normal. Additionally, both the higher doses markedly recoup the antioxidant status. Histopathological studies also showed recovery towards normal in same manner. AgNPs at a dose of 100 µg/kg was found to be most effective in comparison to both the lower doses of leaf extract.

Conclusion & Significance: Above findings powerfully support that *M. alba* leaves have therapeutic potential and biologically synthesized AgNPs enhance its efficacy and can be used as nanomedicine against hepatocellular disorder.

Biography

Asha Singh is a BSR-UGC fellowship awardee, pursuing PhD. She has completed her Master's and Philosophy degrees in Life Sciences. She has published a scientific paper and a book, also was awarded in toxicology presentation organized by Society of Toxicology.

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Evaluation of toxic contents and metals in different cosmetics available in Arabian market

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The definition of a cosmetic identifies the site of application (epidermis, hair system, nails, lips, eyes) and the intended functions (cleaning, perfuming, changing the appearance, correcting body odours, protecting and, keeping in good condition).

Cosmetic formulations are that class of products whose atypical features can be well thought-out, from a biochemical and toxicological point of view, as intermediary between both foods and drugs. For undeniably, the frequency of use of cosmetic formulations is generally scheduled on a daily basis, and in some instances several cosmetic products, like, for example, a lipstick or a hand cream, can be applied to the body twice or more times a day. Simultaneously, the techniques that are generally used in the production of a great variety of cosmetic formulations are directly derived from the experience of pharmaceutics.

During the past decades the safety of cosmetic products and their ingredients has attracted greater than ever attention; thus their toxicological safety evaluation is a relatively young discipline, which evolved in the second half of the 20th century. Up to the 1960s it was commonly believed that cosmetic products will never go beyond the surface of the human body. Therefore, local effects were the primary safety concern. The first consistent in vivo tests for skin and eye irritation were developed in the 1940s.

Oral exposure can occur from wearing of cosmetic products containing heavy metal impurities around the mouth and also from hand to mouth contact.

Biography

Sahar Y Issa has completed her Doctorate degree in Clinical Toxicology & Forensic Medicine in 2008, from Faculty of Medicine, Alexandria University, Egypt and is a Lecturer of Clinical Toxicology & Forensic Medicine in the same university. She is currently a Consultant Toxicologist, and the Medical Director, supervising Emergency Toxicology, Molecular Toxicology and Therapeutic Drug Monitoring units in Dammam Poison Control Center, MOH - Saudi Arabia. She has published more than 25 papers in reputed journals and serving as an Editorial Board Member of repute.

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Possible neuroprotective mechanisms of ginseng and rutin in experimental model of head injury induced cognitive dysfunction

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Introduction: Head injury is a major cause of disability and death. Possible role of neuroinflammation, nitric oxide, microglia and oxidative stress have been suggested in the pathophysiology of traumatic brain injury related complications such as cognitive dysfunction.

Objective: Therefore, the present study was designed to explore the possible role of ginseng and rutin and its interaction with nitric oxide modulator and microglial inhibitor against experimental of head injury induced behavioral, biochemical and molecular alterations.

Materials & Methods: Wistar rats were exposed to head injury by using weight-drop method. Following injury and a post-injury rehabilitation period of two weeks, animals were administered vehicle/drugs for another two weeks.

Results: Traumatic brain injury caused significant memory impairment in Morris water maze task as evident from increase in escape latency and total distance travelled to reach the hidden platform. Time spent in target quadrant and frequency of appearance in target quadrant was also significantly decreased in head trauma rats. Further, there was a significant increase in oxidative stress (elevated malondialdehyde, nitrite concentration and decreased reduced glutathione, superoxide dismutase and catalase levels), neuroinflammation (TNF-α and IL-6) and acetylcholinesterase levels in both cortex and hippocampal regions of traumatized rat brain. Ginseng (100-200 mg/kg), Rutin (20-80) treatment for two weeks significantly attenuated all these behavioral, biochemical and molecular alterations, suggesting their neuroprotective effect. Further, combination of sub effective doses of ginseng (50 and 100 mg/kg) or rutin (40, 80) with microglia inhibitor as well as nitric oxide modulators significantly modulates their protective effect respectively. The present study suggests that these flavanoids produce their neuroprotective effect by involving microglial as well as nitric oxide pathways.

Conclusion: The study further provides a hope that these flavanoids could be used effectively for the management of brain traumatic injury and related complication.

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Effects of combined treatment with *Tithonia diversifolia* and Chloroquine on Chloroquine-resistant malaria in mice

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The development of Chloroquine as an antimalarial drug and the subsequent evolution of drug-resistant *Plasmodium* strains had major imparts on global public health in the 20th century. *In vivo* curative anti-plasmodial activity of ethanol extract and fraction of *T. diversifolia* leaves alone and in combination with Chloroquine were evaluated using albino mice infected with Chloroquine resistant *P. yoelii* (*P. yoelii*^{R}) intraperitoneally. Possible effects on the hematological indices and mechanisms of anti-plasmodial action were monitored using standard protocols. Oral administration of the ethanol extract of *Tithonia diversifolia* leaves to mice caused no death at doses ranging from 10-5000 mg/kg. The presence of the phytochemical content of the extract in the order: Reducing sugar>alkaloids>steroids>phenol>terpenoids>tannins>soluble carbohydrate were obtained. The result of the percentage parasitemia of mice infected with *P. yoelii*^{R} treated with 5 mg/kg b. w of artemeter, different doses of crude extract and C70:M30 fraction co-administered with 10 mg/kg b. w of Chloroquine from day 7 to day 28 revealed significant ($p<0.05$) reduction compared with infected mice administered 0.2 ml of distilled water. The mice infected with *P. yoelii*^{R} treated with 5 mg/kg b. w of artemeter, 200 mg/kg b. w of crude extract and C70:M30 fraction co-administered with 10 mg/kg b. w of Chloroquine showed significant ($p<0.05$) reduction in hemozoin level compared with the infected mice administered 0.2 ml of distilled water. The mice infected with *P. yoelii*^{R} treated with 5 mg/kg b. w of artemeter, crude extract and C70:M30 fraction showed dose dependent significant ($p<0.05$) increase in the PCV and RBC compared with the infected control mice. The plasma calcium ion (Ca^{2+}) and free fatty acid concentration revealed significant ($P<0.05$) decrease in the *P. yoelii*^{R} infected mice treated with varying doses of the extract in combination with Chloroquine compared with the parasitized untreated mice. The respective antimalarial drugs and the extract increase the percentage inhibition of phospholipase A_2. The effect of the crude extract, active fraction and antimalarial drugs causes inhibition of hypotonicity-induced hemolysis. This indicates that *T. diversifolia* leaf extract dose-dependently restores the efficacy of Chloroquine against *P. yoelii*^{R} malaria in mice due to rapid rate of recovery from plasmodial infections with the co-administration.

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Strategies to identify and mitigate risks for first-in-human and early clinical trials with investigational medicinal products

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Traditionally, first in human clinical trials were mostly associated with a single ascending dose (SAD) design, which were subsequently followed by a multiple ascending dose (MAD) CT. Since then, integration of the non-clinical data available before FIH administration and the pharmacokinetic (PK), pharmacodynamic (PD) and human safety data emerging during a trial has evolved. Consequently, the increasing practice is to perform FIH trials and early phase CTs with integrated protocols that combine a number of different study parts, e.g. SAD, MAD, food effects, etc. The non-clinical testing and experimental approaches for FIH/early CTs are used to identify factors influencing the risks associated with an IMP. Special attention should be given to the estimation of the initial dose to be used in humans and to the subsequent dose escalations to a predefined maximum dose. In defining an appropriate development program for a new medicinal product, information on safety needs to be integrated from many sources and reviewed in an iterative process. This workshop is intended to discuss the transition from non-clinical to early clinical development by outlining factors influencing risk and how these should be mitigated in protocol design.

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Drug-induced hyperammonemia: Are there specific therapies?

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Objective: The objective of this study was to give an overview about drugs capable to induce hyperammonemia (HA), to discuss their pathophysiology and to provide treatment options for HA.

Methods: Literature review on PubMed and common textbooks.

Results: Valproate (VPA) frequently induces HA, even if not overdosed. VPA and its metabolites inhibit enzymes of mitochondrial ß-oxidation, which may cause depletion of carnitine and lower acetyl-CoA, essential for the synthesis of N-acetylglutamate (NAG). The latter is an allosteric co-factor of carbamoyl-phosphate-I-synthase, ultimately impairing detoxification of ammonia. Topiramate, Carbamazepine, Barbiturates, Salicylates may each contribute to HA, whereby underlying pathomechanisms are largely speculative or unknown. Finally, acetaminophen as the parent drug has been demonstrated to induce decreased activity of both, carbamoyl-phosphate-synthase-I and glutamine synthase. This was accompanied by HA indicating that CPS-I and/or glutamine synthase were inhibited *in vivo* to an extent sufficient to compromise ammonia clearance. Chemotherapeutics (CTX) frequently induce HA either by reduction in the expression of glutamine synthase, carbamoyl-phosphate synthase, and ornithine-transcarbamylase. CTX also may lead to functional arginine deficiency secondary to increased catabolism.

Treatment Options: Immediate withdrawl of the offending drug suspicious for HA should be followed. Oral rifaximine can reduce bacterial ammonia synthesis in the gut, lactulose enema can entrap ammonia and hemodialysis may serve as a rescue therapy. Sodium-benzoate or phenylbutyrate can reduce ammonia synthesis and eliminate glycine and glutamine. Adequate amounts of dextrose (e.g. a 10% dextrose solution) and fatty acids should be provided, while protein intake should be paused. More specific treatment options include L-carnitine in deficient patients or infusion of L-arginine in patients with VPA-overdose. Administration of carglumic acid may overcome proximal inhibition of enzymes of the urea cycle.

Conclusion: Although infrequent, HA may be a severe medical condition occurring during therapeutic pharmacological treatment or drug overdose. Understanding the pathophysiology, general or more specific treatment options may become life-saving.

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Pattern of acute organophosphorus poisoning at University of Gondar Teaching Hospital, Northwest Ethiopia

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Background: Despite the apparent benefits of organophosphate compounds (OPCs) acute organophosphate (OP) pesticide poison is an increasing problem worldwide. In a country like Ethiopia, where agriculture is a major component of the economy, these compounds are readily available to the general public. There is paucity of evidence from Ethiopia showing the pattern of organophosphate poisoning (OPP) in healthcare facilities.

Objective: The objective of this study was to evaluate retrospectively the pattern of acute OPP at the University of Gondar Teaching Hospital in northwest Ethiopia, conducted during September 2010 through December 2014. Data was collected through chart review of patients who were admitted due to poisoning. Data was analyzed using SPSS 20.

Result: OPP in University of Gondar teaching hospital accounts for about 38.46% of all emergency room admissions for poisoning. Out of the 90 cases studied 60% (54) were women, with male to female ratio of 1:1.5. The mean age of the patients was 25.5 with a standard deviation of 9.45. 56.7% of the cases studied lived in an urban environment compared to 43.3% who lived rurally. In the vast majority of patients, 90% (81) patients had ingested OP as an act of suicide. Regarding the route of exposure, oral ingestion was most common in suicidal cases (88.9%). The elapsed time between the time of poison ingestion and the start of the treatment, ranged from 13 minutes to 1 day. Health care professionals' used decontamination methods such as gastric lavage and activated charcoal (45.6%) and 36.7% used atropine for OPP treatment. The mean hospital stay was 0.74 days. In the present study family problems were a leading cause of suicides and accounted for 45.8% of all cases.

Conclusion: As a developing nation whose economy relies heavily on agriculture, Ethiopia continues to have OP compounds remain a common cause of acute poisoning. This is particularly concerning for younger generation who have high rates of OPP and whose numbers continue to raise. This data suggests that it is essential to strengthen Ethiopians regulatory policy concerning the availability of OPCs. Additionally, it will be important to design an appropriate health education program for the prevention of both suicidal and accidental OPPs for the benefit of the public at large.

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Enhanced anti-cancer efficacy of Bromelain nanoparticles against Ehrlich ascites carcinoma upon oral administration

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Oral administration of anti-cancer drugs is an effective alternative to improve their efficacy and reduce undesired toxicity. Bromelain (BL) is known as an effective anti-cancer phyto-therapeutic agent; however, its activity is reduced upon oral administration. As a result, BL was encapsulated in Poly lactic-co-glycolic acid to formulate nanoparticles (NPs), which were further coated with Eudragit L30D polymer in order to provide stability against the gastric acidic conditions upon oral delivery of NPs. NPs were characterized for BL entrapment, proteolytic activity and mean particle size. The stability and release pattern of NPs was also evaluated under simulated gastrointestinal tract pH conditions. Cytotoxicity studies, carried out in human cell lines of diverse origin showed a significant dose advantage (~7-10 folds) with NPs in reducing the IC50 values as compared to free BL. The cellular uptake of NPs in MCF-7, HeLa cells and Caco-2 cell monolayer was significantly enhanced several folds as compared to free BL. Altered expression of marker proteins associated with apoptosis and cell death (P53, P21, Bcl2, Bax) also confirmed the enhanced anti-carcinogenic potential of formulated NPs. Oral administration of NPs reduced the tumor burden on mice and also increased their life-span when compared with the free BL. The generation of reactive oxygen species, induction of apoptosis and impaired mitochondrial membrane potential in tumor cells treated with NPs confirmed the suitability of NPs as a promising candidate for oral chemotherapy.

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Environmental risk assessment progress of chemicals in China

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Chemical pollution has become a serious environmental problem in rapidly developing China since 1980s, and the environmental risk assessment of chemicals has increased attention from the government. This report briefly introduces the progress of risk assessment for environmental chemicals in China, the related challenges and research needs are also discussed. The Chinese government promulgated "Provisions on the first import of chemicals and the import and export of toxic chemicals" in 1994, "Measures on environmental management of new chemical substances" came into force in 2003, and was revised in 2010. These indicated that the management pattern of new chemical substances was converted from hazard assessment to risk assessment. In China, current environmental chemical risk assessment system includes qualitative ecological risk assessment, quantitative ecological risk assessment and qualitative health risk assessment. These three risk assessments are mainly composed by hazard assessment, exposure assessment and risk characterization to the environmental chemicals. Meanwhile, "the guideline for risk assessment of chemical substances" and "the guideline for hazard identification of new chemical substances" are established to protect the environmental ecosystem, ensure human health and regulate the chemical risk management and these two guidelines also provide technical support to the risk assessment of chemicals. Despite the good progress on risk assessment of environmental chemicals in China, the basic work still needs to be developed. Therefore, featured human and environmental exposure parameters based on characteristic of Chinese population and environment scenarios including suitable models applied in chemical risk assessment should be developed. Such researches will effectively promote the integration of chemical risk management in China.

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A new paradigm in application of interspecies physiologic and allometric scaling and its human relevance in toxicological risk evaluation

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During the past few years, there has been a paradigm shift in the field of toxicological risk assessment for chemicals, including an emerging consensus on the need for a flexible, innovative and interdisciplinary science-based approach for investigative toxicology. As a matter of necessity, the potential for a chemical agent to produce adverse health effects in humans is investigated in experimental animals, typically rodents and non-rodents. Toxicological effects observed in the experimental animals may be taken as evidence that humans might show similar responses to equivalent chemical exposures. The use of these surrogates is premised upon the high degree of unique physiological, biochemical and anatomical similarities or variations among mammalian species. This uniqueness is reflected by inter-species differences in protein binding, drug metabolism and drug transport in pharmacokinetic phase and changes in receptor expression, affinity and distribution in pharmacodynamic phase to result in interspecies variation in toxicity profile. Allometric scaling is an empirical approach which considers these species differences including body surface area in normalization of different parameters. Interspecies scaling is not without short comings and failures. Over the years, interspecies scaling has drawn enormous attention and new scaling methods have been developed in order to improve the performance of these predictions. During dose-response extrapolation and setting acceptable levels of human exposure, a quantitative relationship between the dose levels in humans and in animals is to be specified, that is expected to result in the same degree of adverse effect. The empirical data on comparative toxicological potencies support the general practice of scaling animal potencies to humans and theoretical support for scaling toxicity should be available from analysis of the allometric variation of key physiological parameters across mammalian species. Such an analysis has the benefit of providing an articulated rationale for the scaling methodology and of setting out the underlying assumptions explicitly.

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Ameliorating effects of Thymoquinone on Titanium Dioxide nanoparticles induced toxicity in rats

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The ameliorating effect of Thymoquinone (TQ), the major active ingredient of *Nigella sativa* seeds, on Titanium Dioxide naonparticles (TiO_2 NPs) induced toxicity and oxidative stress in Sprague-Dawley (SD) rats was investigated. 40 rats were divided into 4 equal groups. The first, second, third and fourth groups received TiO_2 NPs, TiO_2 NPs and TQ, TQ only for 6 weeks. The fourth group served as the control. Exposure to TiO_2 NPs resulted in increased liver enzyme markers, oxidative stress indices, tumor necrosis factor alpha (TNF-α) and DNA damage was assessed by comet assay. TiO_2 NPs resulted in decreased level of testosterone hormone. Histopathological alterations were also observed in the liver, brain, lung and testes. Transmission electron microscopy revealed changes in the hepatocytes cytoplasm related to the oxidative stress and presence of nanoparticles in the testicular tissues. Co-administration of TQ with TiO_2 NPs decreased the level of liver enzymes, oxidative stress, TNF-α and DNA damage and ameliorates the level of testosterone. Furthermore, TQ increased the total antioxidant and glutathione (GSH) levels. In conclusion, TiO_2 NPs induce hazardous effects in different organs and are closely related to oxidative stress. TQ have anti-oxidative and anti-inflammatory effect against the detrimental effect of TiO_2 NPs.

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Indicators of repeated oral exposure to lead combined with Cadmium in non-lactating ewes

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Lead (Pb) and Cadmium (Cd) pollution co-exists and humans and animals may be co-exposed to both toxics. These heavy metals are known for their cumulative properties in environment. We have designed our experimental conditions in order to simulate a repeated low oral exposure and to highlight the toxic effects after lead and lead-Cadmium repeated oral exposure for nine weeks in ewes. An experiment was conducted using "Ouled Djellal" ewes during two periods: Before exposure, where ewes are considered as controls and during exposure 10 ewes were randomly divided in two groups of five; the lead group received lead nitrate at 2.5 mg Pb/kg/day and the lead-Cadmium group received lead nitrate at 2.5 mg Pb/kg/day + Cadmium chloride at 2 mg Cd/kg/day orally for 63 days. Both groups were tested for their blood lead levels and hematological and biochemical parameters before and after receiving the treatment. Before exposure, blood lead levels were below the detection limit of 4 µg/l. Blood levels of lead during 9 weeks of exposure varied from 135±57 µg/l to 356±147 µg/l for the lead group and from 192±75 µg/l to 445±294 µg/l for the co-exposed group. Mean blood lead levels of lead-Cadmium group were more elevated than the ones of the lead group. The transaminases (ALT, AST) and total proteins are high for the Pb-Cd group during the two last weeks of exposure. The ratio albumin/globulin is low. The rates of hematocrit and hemoglobin decreased for the Pb-Cd group to reach a value of 24% and 7.9±0.6 mg/100ml, respectively. The co-administration of Pb and Cd resulted in a significant reduction in zinc and copper plasma contents and the estimation of toxicokinetic parameters (AUC, Vs, Tmax, Cmax) revealed a greater systemic exposure. Concentrations of lead and Cadmium were determined in organs. Histopathologic lesions occurred in liver and kidney. ANOVA was used for statistical analysis.

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