

2014

Pharmaceutical Sciences Abstracts

Annual International Conference
on Pharmaceutical Sciences
5-8 May 2014, Athens, Greece

Edited by Gregory T. Papanikos

THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH



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Preface

This abstract book includes all the summaries of the papers presented at the *Annual International Conference on Pharmaceutical Sciences, 5-8 May 2014*, organized by the Health Research Unit of the Athens Institute for Education and Research. In total there were 33 papers, coming from 15 different countries (Austria, Brazil, Canada, China, Denmark, Egypt, India, Kingdom of Bahrain, Malaysia, Portugal, Saudi Arabia, Singapore, Turkey, UK, USA). The conference was organized into 8 sessions that included areas of Pharmaceutical Sciences and other related fields. As it is the publication policy of the Institute, the papers presented in this conference will be considered for publication in one of the books of ATINER.

The Institute was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world could meet in Athens and exchange ideas on their research and consider the future developments of their fields of study. Our mission is to make ATHENS a place where academics and researchers from all over the world meet to discuss the developments of their discipline and present their work. To serve this purpose, conferences are organized along the lines of well established and well defined scientific disciplines. In addition, interdisciplinary conferences are also organized because they serve the mission statement of the Institute. Since 1995, ATINER has organized more than 150 international conferences and has published over 100 books. Academically, the Institute is organized into four research divisions and nineteen research units. Each research unit organizes at least one annual conference and undertakes various small and large research projects.

I would like to thank all the participants, the members of the organizing and academic committee and most importantly the administration staff of ATINER for putting this conference together.

Gregory T. Papanikos
President

Athens Institute for Education and Research
Human Development Research Division
Research Unit of Health



Annual International Conference on Pharmaceutical Sciences
5-8 May 2014, Athens, Greece

PROGRAM

Conference Venue: [Titania Hotel](#) Address: Panepistimiou 52, 106 78 Athens, Greece

Organization and Scientific Committee

1. Dr. Gregory T. Papanikos, President, ATINER.
2. Dr. George Poulos, Vice-President of Research, ATINER & Emeritus Professor, University of South Africa, South Africa.
3. Dr. Zoi Boutsoli, Deputy Head, Health Research Unit, ATINER & Instructor, Open University of Greece.
4. Dr. David M. Wood, Academic Member, [Health Research Unit](#) and [Chemistry Research Unit](#), ATINER &, Research Fellow, Institute of Pharmaceutical Sciences, King's College London, U.K.
5. Dr. Nicolas Abatzoglou, Head, [Environment Research Unit](#), ATINER & Professor, Department of Chemical & Biotechnological Engineering, Université de Sherbrooke, Canada, Chair Pfizer, PAT in Pharmaceutical Engineering, Director GREEN-TPV and GRTP-C & P.
6. Dr. Paul Contoyannis, Head, Health Research Unit, ATINER & Associate Professor, McMaster University, Canada.
7. Dr. Panagiotis Petratos, Vice President of ICT, ATINER & Associate Professor, Department of Computer Information Systems, California State University, Stanislaus, USA.
8. Dr. Andy Stergachis, Professor, University of Washington, USA.
9. Dr. Daphne Halkias, Fellow, Institute of Coaching at McLean Hospital, Harvard Medical School, USA.
10. Mr. Apostolos Tsiachristas, Junior Research Fellow, Institute for Medical Technology Assessment, Erasmus University Rotterdam, the Netherlands.
11. Mr. Vasilis Charalampopoulos, Researcher, ATINER & Ph.D. Student, University of Strathclyde, U.K.
12. Ms. Olga Gkounta, Researcher, ATINER.
13. Ms. Effie Stamoulara, Researcher, ATINER.

Administration

Fani Balaska, Stavroula Kiritsi, Konstantinos Manolidis, Katerina Maraki, Celia Sakka,
Konstantinos Spiropoulos & Ioanna Trafali

C O N F E R E N C E P R O G R A M

(The time for each session includes at least 10 minutes coffee break)

Monday 5 May 2014

08:00-08:30 Registration

08:30-08:45 Welcome and Opening Remarks

- Dr. George Poulos, Vice-President of Research, ATINER & Emeritus Professor, University of South Africa, South Africa.
- Dr. Gregory T. Papanikos, President, ATINER.
- Dr. Zoi Boutsoli, Deputy Head, Health Research Unit, ATINER & Instructor, Open University of Greece.
- Dr. David M. Wood, Academic Member, Health Research Unit and Chemistry Research Unit, ATINER & Research Fellow, Institute of Pharmaceutical Sciences, King's College London, U.K.

08:45-10:30 Session I: Pharmacology/Biochemistry

Chair: David M. Wood, Academic Member, Health Research Unit and Chemistry Research Unit, ATINER & Research Fellow, Institute of Pharmaceutical Sciences, King's College London, U.K.

1. *Jun-Rong Du, Professor and Head of Department of Pharmacology, Sichuan University, China. Immunomodulation Through TLR/Peroxiredoxin Signaling Contributes to the Neuroprotective Effect of Ligustilide Against Cerebral Ischemia.
2. *Khairia Youssef, Professor, Future University, Egypt, Iten Mamdouh, Assistant Lecturer, Future University, Egypt, Nasser Saad, Associate Professor, Ain Shams University, Egypt, Joachim Gullbo, Professor, Uppsala University, Sweden & Khaled Abouzid, Vice Dean & Professor, Ain Shams University, Egypt. Novel Curcumin Analogs Modeling, Synthesis, Tubulin Polymerization and Cytotoxic Assays.
3. Gangadharappa Hosahalli Veerabhadrappe, Assistant Professor, Department of Pharmaceutics, JSS College of Pharmacy, Sri Shivarathreeshwara Nagar, Mysore, India. Formulation and Evaluation of Celecoxib Nanospogne Hydrogels for Topical Application.
4. *Krishna Kamsagara Linganna, Assistant Professor, Department of Pharmacology, JSS College of Pharmacy, JSS University, Mysore, Karnataka, India. Cardioprotective Activity of Fruit Extract of Momordica Dioca Roxb. on Isoproterenol Induced Toxicity on Rats.
5. Sonia Al-Qadi, Postdoc Fellow, University of Copenhagen, Denmark. Grasshopper Brain Barrier for CNS Drug Discovery: Transcriptomic and Functional Analysis of Efflux Transporters.
6. Caroline Magnani, PhD Student, Pharmaceutical Sciences University, Brazil. In Vitro Safety Evaluation of Caffeic Acid.

10:30-12:00 Session II: Medical Issues and New Developments

Chair: *Jun-Rong Du, Professor and Head of Department of Pharmacology, Sichuan University, China.

1. Carolyn Henry, Professor, University of Missouri, USA. One Health and It's Relevance to Biomedical Research and Drug Discovery.
2. Munirah Ismail, PhD Student, National University of Singapore, Singapore. Development of Transcatheter Heterotopic Valves to Treat Tricuspid Regurgitation.
3. *Hale Ergin, PhD Student, Selcuk University, Turkey & Seyfullah Haliloglu, Professor Doctor, Selcuk University, Turkey. Is Irisin A Miracle to Weight Loss?
4. Buthaina Al Asfoor, Nursing Supervisor, Ministry of Health, Kingdom of Bahrain. The Correlation between Type A Personality and the Risk for Coronary Heart Disease.
5. Nadiyah Wan-Arfah, PhD Student, Universiti Sains Malaysia, Malaysia. Short-Term and Long-Term Survival Probabilities in First-Ever Stroke Patients.

12:00-13:30 Session III: General Health Care Issues I

Chair: *Khairia Youssef, Professor, Future University, Egypt.

1. Susan Parish, Director, Brandeis University, USA, Kathleen Thomas, Researcher, University of North Carolina at Chapel Hill, USA, M Mitra, E Son, A Bonardi & P Swoboda. A National Profile of Deliveries by Women with Intellectual Disabilities in the US: Maternal Characteristics and Pregnancy Outcomes.
2. Kathleen Sternas, Associate Professor, Seton Hall University, USA. Teenage Pregnancy Prevention in Canada, Greece, Philippines, and the United States: Evaluation of an Evidence-Based Intervention to Reduce Risky Behaviours and Promote Abstinence and Health in Teenagers.
3. Leslie Graham, Adjunct Professor, University of Ontario, Canada. All Through the Night: An Interprofessional Simulation.

13:30-14:30 Lunch (details during registration)

14:30-16:00 Session IV: Plants

Chair: Dr. K. L. Krishna, Professor, JSS College of Pharmacy, JSS University, Mysore, Karnataka, India.

1. Perwez Alam, Assistant Professor, King Saud University, Kingdom of Saudi Arabia. Stability Indicating Densitometric HPTLC Method for Quantitative Analysis of Biomarker Naringin in the Leaves and Stems of *Rumex Vesicarius* L.
2. Selvaraj Kunjiappan, Research Scholar, Department of Chemical Engineering, Jadavpur University, Kolkata, India, Ranjana Chowdhury, Professor, Jadavpur University, India & Chiranjib Bhattacharjee, Professor, Jadavpur University, India. Antioxidant Activity and Hepatoprotective Potential of Azolla Microphylla Phytochemically Synthesized Gold Nanoparticles on *Cyprinus Carpio* L. in Vitro and in Vivo.

16:00-17:30 Session V: Drug Delivery and Other Issues

Chair: Selvaraj Kunjiappan, Research Scholar, Department of Chemical Engineering, Jadavpur University, Kolkata, India.

1. Omneya Mohammed Khowessah, Associate Professor, Cairo University, Egypt, Raguia Ali Shoukri, Professor, Cairo University, Egypt & Abdulaziz Mohsen Al-Mahallawi, Teaching assistant, Cairo University, Egypt. Nano-Transfersomal Ciprofloxacin Loaded Vesicles for Otological Non-Invasive Delivery of Ciprofloxacin to the Middle Ear.
2. Aly Ahmed Abdelbary, Assistant Professor, Cairo University, Egypt, Ibrahim Elsaye Assistant Professor, Cairo University, Egypt & Ahmed H. Elshafeey, Associate Professor, University of Waterloo, Canada. Nanosizing of a Poorly Soluble Drug, Diacerein by High Pressure Homogenization: Process Optimization, Factorial Analysis and Pharmacokinetic Study in Healthy Human Volunteers.
3. *Anandkumar Tengli, Assistant Professor, Department of Pharmaceutical Chemistry, JSS College of Pharmacy, JSS University, Mysore, Karnataka, India. `.
4. Joana Marto, Aida Duarte, Luis Gouveia, Teresa Cidade, Pedro Pinto, Eduardo Oliveira, Antonio Aimeida, Helena Ribeiro, Laboratorios Atral, Portugal. Starch Pickering Emulsion: A Safe Vehicle for Topical Drug Delivery.
5. Joshua Boateng, Lecturer, University of Greenwich, UK, Sajjad Khan, PhD Student, University of Greenwich, UK, Vivek Trivedi, Lecturer, University of Greenwich, UK & John Mitchell, Emeritus Professor, University of Greenwich, UK. Formulation and Characterisation of Oral Thin Films for Buccal Mucosa Drug Delivery for Paediatric Patients.

21:00-23:00 Greek Night (Details during registration)

Tuesday 6 May 2014

08:00-10:30 Session VI: Medicines Use

Chair: Mohammad Alhumayyd, Professor of Pharmacology, King Saud University

1. Terezinha de Jesus Andreoli Pinto, Professor, Sao Paulo U., Brasil. Impact Evaluation of Changes in the Manufacturing Line of the Cyproterone Acetate through Analysis of Comparative Dissolution Profile.
2. Mervat Kassem, Assistant Professor, Alexandria University, Egypt, Dina Raafat, Lecturer, Alexandria University, Egypt, Hamida AbouShlieb, Professor, Alexandria University, Egypt, Nourhan Fanaki, Professor, Alexandria University, Egypt. Biochemical versus Molecular Methods in the Detection of Bacterial Contaminants in Some Egyptian Pharmaceuticals in Egypt.
3. Anil Mandal, Consultant Nephrologist, University of Florida, USA. Glycemic control with Intensive Insulin Treatment Fundamental to Fundamental to Renal Preservation in Diabetes. (Tuesday 6th of May)
4. Flavia Laffleur, Researcher, University of Innsbruck, Austria & Andreas Bernkop-Schnurch, Professor, University of Innsbruck, Austria. Preactivated Thiomers for their Potential in the Treatment of Dry Mouth Syndrome.
5. *Balamuralidhara V., Assistant Professor, Department of Pharmaceutics, JSS College of Pharmacy, JSS University, Mysore, Karnataka, India. Formulation And Evaluation Of Environmental Responsive Nanoparticles For Colon Targeted Drug Delivery System.
6. *Afrasim Moin, Assistant Professor, Department of Pharmaceutics, JSS College of Pharmacy, JSS University, Mysore, Karnataka, India. Formulation and Evaluation of Dual Drug Conjugate Loaded Nanoparticles for the Treatment of Cancer.

10:30-12:30 Session VII: In Vivo/Animal Studies

Chair: Anil Mandal, Consultant Nephrologist, University of Florida, USA.

1. Mohammad Alhumayyd, Professor of Pharmacology, King Saud University, Saudi Arabia, Ishfaq Bukhari, Assistant Professor of Pharmacology, King Saud University, Saudi Arabia & Abdulrahman Almotrefi, Professor of Pharmacology, King Saud University, Saudi Arabia. Piperine and Ketoconazole Increase Plasma Domperidone Concentrations in the Rat. (Tuesday 6 of May)
2. Saleh Samira, Professor, Cairo University, Egypt, El-Maraghy Nabila, Zagazig University, Egypt, Barakat Waleed, Zagazig University, Egypt & Reda Enji, October 6 University, Egypt. Modulation of Diabetes and Dyslipidemia in Diabetic Insulin-Resistant Rats by Mangiferin: Role of Adiponectin and TNF- α .
3. Babita Bhatia, PhD Student, Mumbai University, India & Purushottam G Kale, Associate Professor and Head Ramniranjan Jhunjhunwala College, India. Potential of Mica Nanoparticles in Correcting Heat Induced Changes In Structural and Biochemical Aspects of Testes of Albino Wistar Rats.
4. *Cristina Mello-Sampayo, Professor, Faculdade de Farmácia Universidade de Lisboa, Portugal, *Cristina Marques, Professor, Faculdade de Farmácia Universidade de Lisboa, Portugal, Helena Canhão, Professor Rheumatology, Instituto de Medicina Molecular, Faculdade de Medicina da Universidade de Lisboa, Portugal, Beatriz Silva-Lima, Full Professor, Head of Department Pharmacological Sciences Unit, iMed.Ulissboa, Faculdade de Farmácia, Universidade de Lisboa, Ana Lopes, Instituto de Medicina Molecular, Faculdade de Medicina da Universidade de Lisboa, Portugal, Bruno Vidal, Rheumatology Research Unit, Instituto de Medicina Molecular, Faculdade de Medicina da Universidade de Lisboa, Portugal, Duarte Stilwell, Veterinary, Clinica Veterinária de Colares, Sintra, Portugal & Alaíde Agripino, Student, Unidade de Biotecnologia Ambiental (UBiA), Departamento de Ciências e Tecnologia da Biomassa, Faculdade de Ciências e Tecnologia da Universidade de Lisboa, Portugal. Effects of Ovariectomy on the Bone Structure and Bone Turnover in Diabetic Female Rats.

12:30-13:30 Lunch (Details during registration)

13:30-16:00 Session VIII: Formulation and Other Issues

Chair: Flavia Laffleur, Researcher, University of Innsbruck, Austria

1. Sara Raposo, Researcher, Laboratório Edol, Portugal, Manuela Urbano, Technical and Production Manager. Laboratório Edol, Portugal, Helena Ribeiro, Associate Professor, University of Lisboa, Portugal. Scale Up of a Low Energy Process For The Production of Oil in Water Emulsions Containing Mometasone Furoate.
2. Vera Isaac, Professor, UNESP-University Estadual Paulista, Brasil. Físico Químico Behavior and Photoprotector of Emulsified Systems Undergone to Termic Stress of an International Travel.

17:30-23:00 Urban Walk (Details during registration)

21:00-22:00 Dinner (Details during registration)

Wednesday 7 May 2014

Cruise: (Details during registration)

Thursday 8 May 2014

Delphi Visit: (Details during registration)

Aly Ahmed Abdelbary

Assistant Professor, Faculty of Pharmacy- Cairo University, Egypt

Ibrahim Elsayed

Assistant Professor, Faculty of Pharmacy- Cairo University, Egypt

&

Ahmed H. Elshafeey

Associate Professor, School of Pharmacy and Waterloo Institute of
Nanotechnology, University of Waterloo, Canada

**Nanosizing of a Poorly Soluble Drug, diacerein by
High Pressure Homogenization:
Process Optimization, Factorial Analysis and
Pharmacokinetic Study in Healthy Human
Volunteers**

Introduction: Nowadays, crystalline nanosuspensions (nanocrystals) are considered a valuable formulation for drugs having poor dissolution rate and/or aqueous solubility. Diacerein (DCN) is classified as BCS class II with low solubility (3.197 mg/L) and consequently low oral bioavailability (35–56 %). Hence, increasing the aqueous solubility of DCN should result in increased bioavailability. High pressure homogenization (HPH) is a simple top down technique which can be used to produce nanosuspensions. In this work, the disadvantages of HPH process were significantly reduced through the avoidance of the pre-milling cycles and the efficient reduction of the number of homogenization cycles. In order to increase both the solubility and dissolution rate of diacerein, HPH was used but with only few number of homogenization cycles preceded by a simple bottom-up technique before the HPH process.

Methods: The nanocrystals of DCN were prepared using a combined bottom-up/top-down technique. Different surfactants: polyvinyl alcohol (PVA), sodium deoxycholate (SDC) and sodium dodecyl sulphate (SDS), with different concentrations (0.1, 0.25, 0.5 and 1% w/v) were used for the stabilization of the nanosuspensions. Full factorial experimental design was employed in order to investigate the influence of formulation variables on nanocrystals properties using Design-Expert® software. The particle size, saturation solubility, in vitro dissolution rate and drug crystallinity were studied. Moreover, the in-vivo performance of the optimized formula was assessed by bioavailability determination in healthy human volunteers.

Results: The concentration of surfactant had a significant effect on both the particle size and polydispersity index values ($p= 0.0009$ and

0.0015, respectively). The 1% surfactant concentration showed the lowest particle size and polydispersity index values compared with the other concentrations. Both type and concentration of surfactant had significant effects on the zeta potential ($p < 0.0001$ and $p = 0.0375$, respectively). The saturated solubility in case of F8 (containing 1% SDC) and F12 (containing 1% SDS) were 1.53 and 2.23 folds higher than the coarse drug powder, respectively. Mean dissolution time (MDT) was equal to 13.65 min in case of coarse drug powder. F8 showed a significant decrease in the MDT to be 4.14 min ($p < 0.001$) and further decrease was also observed in case of F12 (1.26 min) which was significantly different from both the coarse drug powder and F8 ($p < 0.001$). The results of differential scanning calorimetry (DSC) and powder X-ray diffractometry (PXRD) confirmed that HPH had no effect on diacerein crystalline state, and the enhancement of dissolution rate was due to the reduction of particle size and not the appearance of amorphous form. The selected formula (F12) showed a higher bioavailability expressed by the higher $AUC_{0-\infty}$ which was found to be 10.92 ($\mu\text{g}\cdot\text{h}/\text{mL}$) compared to 8.27 ($\mu\text{g}\cdot\text{h}/\text{mL}$) for the reference market product which in turns resulted in 132.04% relative bioavailability.

Conclusions: The nanocrystals of DCN were successfully prepared by HPH using only 5 cycles at 1000 bar without pre-milling. The saturation solubility and in vitro dissolution rate of DCN nanocrystals were significantly increased compared to coarse drug powder. Moreover, the relative bioavailability of the selected formula was calculated and found to be 132.04%.

Buthaina Al Asfoor

Nursing Supervisor, Ministry of Health, Kingdom of Bahrain

The Correlation between Type a Personality and the Risk for Coronary Heart Disease

The diseases of cardiac system remain for the past ten years as the first cause of death in Bahrain. Cardiovascular disorder such as coronary heart disease had been indicated as major subsequent for stressful life. It is assumed that a non-physical factor such as type of personality and life style, stand behind the cardiac diseases susceptibility. Type A personality are those who response more quickly and strongly to stressors both in their overt behaviours and in their physiological reactivity. According to literature reviewed, the type A pattern, particularly the anger/ hostility component, is associated with the development of coronary heart disease and hypertension. This study aimed to investigate correlation between coronary heart diseases and type A personality. It is assumed to help nurses focusing on patients' lifestyle and behavior that is negatively affecting health, and providing necessary health education and guidance. The study design is qualitative correlation. The sample was non-probable convenience 60 participants selected from cardiac care unit and cardiac out-patient clinic in one of the governmental hospitals in Bahrain. Inclusion criteria were both gender Bahraini with history of cardiac disease that aged of 20 years and above. Informed consent was obtained from participants. Data was collected by using formulated demographic date sheet and Glazer Stress Control Life Style Questionnaire through face to face interview. SPSS program was used to analyze data. The result showed strong positive relationship between type A behavior and the occurrence of cardiac diseases (88% shown to be type A personality). Recommendations include development of behavioral testing tools, establishment of screening program, and development of educational and type A behavior modification programs, and incorporation of medical and psychotherapy interventions.

Perwez Alam

Assitant Professor, King Saud University, Kingdom of Saudi Arabia

Nasir Siddiqui

Associate Professor, King Saud University, Kingdom of Saudi Arabia

Adnan Al-Rehaily

Professor, King Saud University, Kingdom of Saudi Arabia

Mohamed Alajmi

Assistant Professor, King Saud University, Kingdom of Saudi Arabia

Omar Basudan

Assistant Professor, King Saud University, Kingdom of Saudi Arabia

&

Tajdar Khan

Assistant Professor, Salman bin Abdul Aziz University, Kingdom of Saudi Arabia

Stability Indicating Densitometric HPTLC Method for Quantitative Analysis of Biomarker Naringin in the Leaves and Stems of *Rumex Vesicarius* L

A simple, sensitive and stability indicating TLC-densitometric method was developed for quantification of naringin in the methanol extracts of stems and leaves of *Rumex vesicarius*. Chromatography was performed on glass-backed silica gel 60 F254 HPTLC plates with the green solvents Ethyl acetate: GAA: MeOH: H₂O in proportion of 30:10:5:1, v/v/v/v as mobile phase. Scanning and quantification of developed plate was done densitometrically at 275 nm. Naringin was subjected to acid and alkali hydrolysis, peroxide treatment, photodegradation, dry heat, moist heat and UV treatment for the stability studies. The system was found to give compact spot for naringin at $R_f = 0.46 \pm 0.001$. The linear regression analysis data for the calibration plots showed good linear relationship with $r = 0.9973$ with respect to area in the concentration range of 100-1000 ng. The regression equation of standard was found to be $Y = 8.448X + 21.395$. The method was validated for detection and quantification limits, precision, recovery and robustness. The LOD and LOQ were found to be 8 and 24 ng band⁻¹, respectively. The drug undergoes complete degradation under acidic treatment and mild degradation under basic and H₂O₂ treatment. The degraded products were well separated from the pure drug. The statistical analysis proves that the developed method for quantification of Naringin is reproducible and selective. The content of Naringin in the stems and leaves of *R. vesicarius* were found to be 1.35% and 2.73% w/w, respectively. Due to the ability of this method in

separating degraded products from the pure drug (naringin), it can be employed as stability-indicating method for in process as well as finished products in the market.

Mohammad Alhumayyd

Professor of Pharmacology, King Saud University, Saudi Arabia

Ishfaq Bukhari

Assistant Professor of Pharmacology, King Saud University, Saudi Arabia

&

Abdulrahman Almotrefi

Professor of Pharmacology, King Saud University, Saudi Arabia

Piperine and Ketoconazole Increase Plasma Domperidone Concentrations in the Rat

This study was carried out to investigate the effect of piperine, a major pungent constituent of the black and red peppers and ketoconazole, a potent inhibitor of cytochrome P-450 isozymes, on the pharmacokinetics of domperidone in rats. Animals received a single daily dose of domperidone (20mg/kg, p.o.) alone or together with piperine (60mg/kg, p.o.) or ketoconazole (50 mg/kg, p.o.) for 5 days. Plasma samples were collected at 0.25, 0.5, 1.0, 2.0, 3.0, 4.0, 6.0, 8.0, 10.0 and 12h after drug administration. The concentrations of domperidone in the plasma were measured using an HPLC method. The concomitant administration of piperine or ketoconazole with domperidone resulted in a significant ($p < 0.05$) increase in the maximum plasma concentration (C_{max}), the mean area under the plasma concentration-time curve (AUC), and the elimination half-life ($t_{1/2}$) of domperidone as compared to those obtained for domperidone alone. The pharmacokinetic interaction of domperidone with piperine or ketoconazole observed in this study may be explained, at least in part, by the inhibitory effect of these agents on the cytochrome P-450 isozymes. These results suggest that an important pharmacokinetic interaction may occur if piperine or ketoconazole are administered concurrently with domperidone.

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Formulation and Evaluation of Environmental Responsive Nanoparticles for Colon Targeted Drug Delivery System

The aim of the present work was to develop Paclitaxel loaded polyacrylamide grafted guar gum nanoparticles as environmental responsive nanoparticle (ERNs) systems for targeting colon. The ERN's were prepared by modified ionotropic gelation technique. The prepared ERN's showed mean diameters in the range of 264 ± 0.676 nm to 726 ± 0.671 nm, and a negative net charge -10.8 mV to -35.4mV. Fourier Transformed Infrared Spectroscopy (FT-IR) and Differential Scanning Calorimetry (DSC) studies suggested that there was no chemical interaction between drug and polymers. The encapsulation efficiency of the drug was found to be 40.92% to 48.14 %. The suitability of the polyacrylamide grafted guar gum ERN's for the release of Paclitaxel was studied by in vitro release at pH 1.2 &7.4. It was observed that, there was no significant amount of drug release at gastric pH and 97.63 % of drug release at pH 7.4 was obtained for optimized formulation F3 at the end of 12 hrs. In vivo drug targeting performance for the prepared optimised formulation (F3) and pure drug Paclitaxel was evaluated by HPLC. It was observed that the polyacrylamide grafted guar gum can be used to prepare nanoparticles for targeting the drug to the colon. The release performance was greatly affected by the materials used in ERN's preparation, which allows maximum release at colon's pH. It may be concluded that polyacrylamide grafted guar gum ERN's loaded with paclitaxel have desirable release responsive to specific environmental pH. Hence it is a unique approach for colonic delivery of drug having appropriate site specificity and feasibility and controlled release of drug.

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Impact Evaluation of Changes in the Manufacturing Line of the Cyproterone Acetate through Analysis of Comparative Dissolution Profile

In recent years, FDA has placed more emphasis on a dissolution profile comparison in the area of post-approval changes and biowaivers. A dissolution profile comparison between pre-change and post-change products, or with different strengths, helps assure similarity in product performance and signals bioequivalence. This work aims to evaluate the impact caused by the tablet compression machine change in the manufacturing of 50 mg cyproterone acetate tablets by examining the comparative dissolution profile between different batches of the drug. For this purpose, the following method was used: the dissolution medium was composed of sodium dodecyl sulfate 0.07 % in 0.01 M hydrochloric acid, apparatus II (paddle), paddle rotation at 100 revolution per minute, 900 mL volume of medium in each vessel, 37.5 ± 0.5 °C of medium temperature, aliquots of 5.0 mL of sample were collected at 5, 10, 15, 20, 30 and 45 minutes. Then, the solutions of the sample and the standard (50.5 µg /mL) were evaluated using a spectrophotometer with wavelength adjusted to 285 nm. From this it was plotted the comparative dissolution profile considering the drug percentage dissolved for each batch in study as a function of the dissolution time. The two drug lots tested were manufactured in the same industry using in the production line different compression machines. Statistical analysis of data was performed and the similarity factor (F2) was calculated. For this study, 12 different batches tablets were used, in a total of 12 cyproterone acetate determinations per batch for the each collected time reported. The results, calculated in percentage of the cyproterone dissolved in the medium, indicated that the both lots of drugs tested showed values greater than 85% ($Q > 70$ %) in the first 15 minutes of analysis. The mean final results (45 minutes) were equivalent to 107.73 % (RSD = 2.98 %) and 108.58 % (RSD = 1.44 %), respectively, independent of the changes on the compression

machine used in the manufacturing line. The statistical analysis was used to evaluate the results variability and to determine the similarity factor among the different batches of drugs tested ($f_2 = 57.64$), allowing to conclude that drugs tested showed similar dissolution profile. The results demonstrated that different batches of cyproterone acetate tablets (50 mg) showed equivalence in the dissolution profile based on the statistical calculations of f_2 , regardless of the changes performed in the manufacturing line.

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Nano-Transfersomal Ciprofloxacin Loaded Vesicles for Otopical Non-Invasive Delivery of Ciprofloxacin to the Middle Ear

Introduction: Ciprofloxacin is a broad spectrum synthetic fluoroquinolone antibiotic that has been used for systemic treatment of otitis media in adults. In addition, ciprofloxacin was approved for topical treatment of otorrhea in children with tympanostomy tubes. The aim of this work was to enhance the local non-invasive delivery of ciprofloxacin across an intact tympanic membrane to the middle ear in an attempt to treat otitis media ototopically.

Methods: Ciprofloxacin nano-transfersomal vesicles were prepared by thin film hydration technique (TFH), using several edge activators (EAs) of varying HLB values. A mixed factorial design ($2^2 \cdot 3^1$) was employed to optimize formulation variables including; phospholipid/EA molar ratio and the presence or absence of cholesterol and charge inducer (positive or negative). The investigated responses were encapsulation efficiency (EE%), particle size (PS), deformability index (DI), and amount of drug released after 8 hours (Q8h).

Results: Analysis of the factorial design revealed that increasing the molar ratio of EA, which was sodium cholate (SC), as well as the presence of cholesterol decreases the EE%, and the negatively charged vesicles exhibited the highest EE% followed by the neutral and the positively charged ones. Formulae prepared using the higher molar ratio of SC possessed smaller particle size. In addition, the presence of cholesterol and/or charge inducer (both types) increased the particle size of the prepared formulae. Regarding the deformability index, the positively charged vesicles showed the highest DI in comparison with neutral and negatively charged ones. Moreover, transfersomal vesicles prepared using higher molar ratio of SC showed higher Q8h.

Conclusion: The use of transfersomes may be considered as a promising non-invasive approach for enhancing trans-tympanic delivery of ciprofloxacin to the middle ear for the treatment of otitis media upon local application. Ex-vivo permeation studies for the optimum formula are underway to verify the results.

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Grasshopper Brain Barrier for CNS Drug Discovery: Transcriptomic and Functional Analysis of Efflux Transporters

Drug efflux activity of ABC transporters, namely the p-glycoprotein (p-gp, *mdr1*), at the human blood brain barrier (BBB), constitutes a crucial challenge for CNS drug development. Accordingly, early screening of drug candidates is pivotal to sort out those whose brain uptake and, hence brain disposition is affected by efflux activity, in addition to measuring drug interactions with cell surface transporters. In this context, affordable, simple, high-throughput and predictive approaches are required. It has been recently proposed that grasshopper (locust) could be exploited, as an ex-vivo BBB model, for drug permeability assessment, as it has provided drug uptake trends similar to those observed in vertebrates. To have an in-depth description for this model and demonstrate its prediction power, as well as validity for drug development, identification of the expression profiles for efflux transporters, was performed in parallel with functional characterization. Gene expression profiling of ABC transporters, in locust brain, was achieved, by transcriptome analysis, followed by phylogenetic sequence analysis. At functional level, efflux activity, was examined, using a selective substrate of the p-gp which is deemed the most prominent efflux pump at the BBB. Lastly, the gene and functional data obtained were matched with those obtained from other conventional drug screening models. Overall, transcriptome analysis revealed the existence of ABC subfamilies, which is indicative of the existence of efflux mechanisms, at the locust BBB. Besides, the phylogenetic sequence analysis further confirms a conserved biology with respect to efflux pump machinery. Functionally, the developed

locust ex-vivo model evidenced a saturable transport process for the p-gp substrate, with kinetic parameters, being comparable to those obtained from in vitro systems. Taken together, the locust ex-vivo BBB model might hold promise, as a cheap model with a high-throughput screening potential in the early discovery phase of CNS drugs.

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Potential of Mica Nanoparticles in Correcting Heat Induced Changes in Structural and Biochemical Aspects of Testes of Albino Wistar Rats

Mica comprises a group of minerals having peculiar physical features and chemical composition. *Biotite* is a common phyllosilicate mineral within the mica group, with the approximate chemical formula $K(Mg,Fe)_3AlSi_3O_{10}(OH)_2$. This black form of mica is used for therapeutic purposes in Ayurvedic system of medicine because it has more of mineral essence. In mica it is actually this essence which is responsible for its therapeutic efficacy. In Ayurveda, biotite is calcined repeatedly to form a mineral drug, Abhraka Bhasma. Abhraka Bhasma is proposed to be made up of mica nanoparticles, hence referred to as nanomica, which can act as a general tonic and potent medicine for treatment of impotency, enhances the semen quality, increases power of retention of semen, growth of semen and the power of begetting children. Heat has adverse effects on mammalian spermatogenesis and eventually leads to sub- or infertility. Several hematological and biochemical parameters are altered, when temperature is elevated, which are signs of physiological responses of an individual against heat stress. A study was designed to substantiate the efficacy of mica nanoparticles, as a drug, on testes and metabolic parameters in heat treated Wistar rats. For this purpose 32 Wistar rats were divided into four groups with eight rats each. Group 1 were given only the vehicle, Group 2 were given nanomica with vehicle, Group 3 were subjected to heat treatment to bring about alterations in the testes (so that efficacy of nanomica can be proved) and Group 4 were subjected to heat treatment followed by nanomica administration. After 30 days, six animals from each group were sacrificed, blood was collected for hemato-biochemical assay and testes was excised and subjected to histoanalysis. Statistical analysis was done using Statistix 0.9, version 3, Beta software followed by ANOVA. Results showed that hyperthermia caused decrease in RBC, Hb, PCV and platelet count but marked increase in WBC count. In biochemical parameters assay. It was found that heat decreased cholesterol, ALT and AST content while increased total protein and alkaline phosphatase levels. Nanomica was found to reverse these

alterations to normalcy. Histoarchitecture of testes revealed normal spermatogenesis in G1 and G2 rats but G2 rats showed hyperactive tubules with large number of spermatozoa in the lumen of the tubules. G3 rats showed atrophied tubules with degeneration of germinal epithelium causing decreased sperm number. G4 rats showed greater percentage of hyperactive tubules with large number of spermatozoa, few recuperating tubules but very few degenerative tubules. It can thus be concluded that the spermatogenic cell series is well protected with concomitant treatment with nanomica to heat stressed rats. These results in totality confirm the use of mica nanoparticles as safe and potent medicine capable of ameliorative responses to heat-evoked hemato-biochemical and histological alterations. These mica nanoparticles, thus, could be prescribed as an adjunct to other drug therapies used currently for treating heat stroke infertile individuals. Due to spermatogenic properties of the mica nanoparticles, a novel therapeutic strategy using these wonder particles can be evolved so that mica nanoparticles can be used as a fecundity drug for people living in hot regions.

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Formulation and Characterisation of Oral Thin Films for Buccal Mucosa Drug Delivery for Paediatric Patients

This study involves the development of oral thin solvent cast films for the potential delivery of the proton pump inhibitor, omeprazole via the buccal mucosa for paediatric patients. The formulations were prepared using different polymers (hydroxypropyl methylcellulose (HPMC), methylcellulose (MC), sodium alginate (SA), carrageenan (CA) and metolose (MET), polyethylene glycol (PEG 400) as plasticiser, omeprazole (model drug) and L-alginate (to stabilise omeprazole). Polymeric gels (1% w/w) were prepared at 40 °C using water and ethanol (10% v/v and 20% v/v) as the casting solvent. PEG 400 (0 and 0.5 % w/w) was added as plasticiser. The films were obtained by drying the gels in an oven (40 °C). Optimised formulations containing (of omeprazole and L-alginate 1:1, 1:2 and 1:3) were prepared to investigate the stabilization of the drug in the gel. Texture analysis (TA) was used to investigate the tensile properties of the films. The physical form of the formulation components within the films was studied using differential scanning calorimetry (DSC), X-ray powder diffraction (XRPD) and attenuated total reflectance Fourier transform infra red (ATR-FT-IR) spectroscopy. Scanning electron microscopy (SEM) provided topographic information with regard to surface architecture of the films. Based on the results from the TA investigation, SA and MET films were chosen for drug loading and further investigation (omeprazole stabilisation). These films showed a good balance between flexibility and toughness required for ease of transportation and patient handling. SEM showed significant differences depending on plasticiser and casting solvent. Plasticised MET (aqueous and ethanolic gels) films showed uniform and smooth surfaces whilst unplasticised films demonstrated rough lumpy surfaces. SA films prepared from aqueous gels showed some lumps present on the surface whilst SA films prepared from ethanolic gels showed similar topography to MET films.

Drug loaded gels showed that omeprazole was unstable, with gels turning red after 20 minutes and therefore required addition of L-arginine. From the results obtained, plasticised (0.5 % w/w PEG 400) MET films prepared from ethanolic (20% v/v) gels and containing omeprazole : L-arginine ratio of 1:2 showed the most ideal characteristics (transparency, ease of peeling and flexibility) and was the formulation of choice for further investigation. The DSC, XRPD and ATR-FTIR results showed that the films were non-crystalline suggesting possible amorphous drug formation or molecular dispersion within the polymeric matrix. The films have potential for paediatric buccal administration and will be further functionally characterized to determine its in vitro and in vivo performance.

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Immunomodulation through TLR/Peroxiredoxin Signaling Contributes to the Neuroprotective Effect of Ligustilide against Cerebral Ischemia

Emerging evidence suggests that blocking TLR4/Prx6 signaling has been proposed to be a novel therapeutic strategy for ischemic stroke. Our previous studies showed that ligustilide (LIG) strongly inhibited the inflammatory response in lipopolysaccharide-stimulated microglia and exerted antineuroinflammatory and neuroprotective effects against ischemic insult, but the underlying mechanisms have largely remained unclear. The present study investigated whether the TLR4/Prx6 pathway is involved in the protective effect of LIG against post-ischemic neuroinflammation and brain injury induced by transient middle cerebral artery occlusion (MCAO) in rats. Intraperitoneal LIG administration (20 and 40 mg/kg/day) at reperfusion onset after MCAO resulted in a reduction of brain infarct size and improved neurological outcome over 72 h. Ligustilide-induced neuroprotection was accompanied by an attenuation of neuropathological alterations, including neuron loss, astrocyte and microglia/macrophage activation, neutrophil and T-lymphocyte invasion, and the inflammatory response, reflected by lower mRNA levels of the proinflammatory mediators tumor necrosis factor α , interleukin-1 β (IL-1 β), intracellular cell adhesion molecule-1, matrix metalloproteinase-9, interferon γ , and IL-17 and higher mRNA levels of the antiinflammatory cytokine IL-10. Moreover, LIG significantly inhibited the expression and extracellular release of Prx6 and activation of TLR4 signaling, reflected by decreased TLR4 expression, extracellular signal-regulated kinase 1/2 phosphorylation, and the activation of transcription factor NF- κ B and signal transducer and activator of transcription 3 in the ischemic brain. The present results indicate that LIG exerts an early and direct protective effect on ischemic brain cells. In addition, ligustilide prevented the activation of TLR4 signaling and subsequent immunity and neuroinflammation after cerebral ischemia/reperfusion by inhibiting TLR4 and its ligand Prx6, thereby exerting beneficial effects on ischemic stroke outcome. These findings support the translational potential of blocking TLR4/Prx6 signaling for the treatment of ischemic stroke.

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Is Irisin a Miracle to Weight Loss?

Obesity is a worldwide health problem which is commonly associated with insulin resistance and is a main risk factor for the development of type 2 diabetes (T2D) and cardiovascular disease. It is described that obesity is a result of a chronic imbalance between energy intake and energy expenditure. The adipose tissue contains two functionally different types of fat: white and brown. On the contrary, white adipose tissue, which only stores fat, brown adipose produce heat as a defense against hypothermia and obesity. Brown adipose tissue affects whole-body metabolism and may alter insulin sensitivity and contribute to weight gain. Therefore, in general antiobesity and antimetabolic disease therapy aims to enhance brown fat thermogenesis. Recent studies introduce that white adipose tissue can be converted to thermogenically active beige adipose tissue via a novel hormone, irisin. It is thought that Irisin basically acts on the cells of white adipose tissue. After exercise training concentration of the irisin increase in mice, thus increasing total energy expenditure and alleviating diet induced insulin resistance in animal models. Irisin takes role on stimulating uncoupling protein 1 (UCP1) expression in white adipose cells. Several transcriptional factors such as coactivator-1 α (PGC-1 α), peroxisome proliferator-activated receptor gamma (PPAR- γ) regulate the expression of UCP1. These transcriptional factors can be induced by exposure to cold temperatures. The precursor of irisin, is cleaved and secreted from muscle during exercise, is named the fibronectin type III domain-containing protein 5 (FNDC5). Irisin is a PGC-1 α -dependent myokine. A recent study by Boström and colleagues reported that expression of the exercise- and PGC-1 α -induced myokine, irisin, promotes the conversion of white fat to brown fat in humans. These data indicate that exercise regulates the expression of irisin in muscle. Thus exercise gives the benefits on metabolic disorders and energy homeostasis.

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All Through the Night: An Interprofessional Simulation

Night shift workers are exposed to multiple health risks, as well as challenges in cognitive and psychomotor performance which impacts patient safety (Geiger-Brown, et al., 2012). As nurse educators, we have a mandate and responsibility to educate nursing students on mitigating the effect of fatigue when providing patient care as well as on healthy lifestyle practices when working the nightshift (CNA, 2010). The purpose of this study was to provide nursing students and members of the interprofessional team the opportunity to experience the nightshift prior to graduation from their respective programs. The intent of this simulation experience was to assist students to develop strategies to provide safe patient care while working the nightshift. Students also had the opportunity to reflect upon healthy lifestyle modifications to support working the nightshift.

In this presentation, results from a 12 hour night shift simulation will be presented. Students from undergraduate nursing (Bachelor of Science in Nursing, BScN), practical nursing (PN), unregulated health care worker, and paramedic programs (n=32) were voluntarily recruited to participate in an all night simulated experience. Program specific faculty were invited to facilitate the simulations. Two experienced registered nurses assisted with the simulations in the role of a confederate or embedded participant. Using mixed methods design, quantitative data were collected using a 10 question pretest-posttest survey. Qualitative data were obtained through open ended questions via online survey and focus group participation. Themes were identified using NVivo research software. The results indicated that fatigue was a limiting factor in performance during the night shift. Students also reported after engaging in the simulation, they felt more confident if dealing with a similar situation in clinical settings. The students reported "feeling united, feeling vulnerable as tiredness sets in". This study demonstrates the importance of self care and patient safety considerations when working the night shift.

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One Health and its Relevance to Biomedical Research and Drug Discovery

The frustratingly slow pace at which medical discoveries have traditionally been translated into new therapy options for patients suggests that there is a need for improved efficiency in the process of clinical research and development. What if the solution to this problem lay [literally] at your feet? Perhaps it does. There is growing awareness that companion animals with naturally-occurring disease can serve as excellent models of human disease and offer significant advantages over more traditional *in vivo* models of induced disease. A cancer that develops naturally in a dog is more likely to have similarities to human cancer in terms of etiology, tumor heterogeneity, metastatic behavior, and response to therapy than does a cancer induced in a laboratory animal with an incompetent immune system. Many infections, neurological abnormalities, orthopaedic diseases, endocrinopathies, toxicities, and immune-mediated diseases also share causes and clinical signs across species. And by genetically mapping disease susceptibility by species and by breed, we can gain valuable clues regarding underlying genetic causes. For example, if one dog breed is uniquely susceptible to Disease X and another breed is rarely affected, comparing the genomics of the two breeds to the rest of the population may help define the underlying etiology for Disease X, as well as provide insight as to how to manage or mitigate it. The goal of this session is to reach audiences involved in medical research and health care who may be unaware of the relevant spontaneously-occurring companion animal models of human disease and how they can be used to speed progress and improve efficiency of biomedical research and clinical application of innovations.

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Formulation and Evaluation of Celecoxib Nanosponge Hydrogels for Topical Application

Celecoxib is a selective cyclo-oxygenase-2 inhibitor has been recommended orally for the treatment of arthritis and osteoarthritis. Long term oral administration of celecoxib produces serious gastrointestinal side effects. It is a highly lipophilic, poorly water soluble drug with oral bioavailability of around 40% (Capsule). This belongs to BCS (Biopharmaceutical classification of system) class II system. This is having least solubility 7.6 µg/ml in water. Therefore the aim of the present investigation was to improve the Solubility and Bioavailability of Celecoxib using Beta-cyclodextrin and NN-Methylene Bisacrylamide Nanosponge Hydrogels. The solubility of the prepared nanosponge freeze dried particles were in the range of 230.49 ± 0.16 to 490.48 ± 0.88 µg/ml which indicates that the solubility of the Celecoxib increases by 20 to 40 folds. From these results confirm that celecoxib was suitable preparation of nanosponge formulation. The prepared Nanosponges were characterized using differential scanning calorimetry, scanning electron microscopy, Transmission electron microscopy, x-ray diffractometry, FT-IR analysis, Zeta-potential and Polydispersity index.

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Fisic Quimic Behavior and Photoprotector of Emulsioned Systems Undergone to Termic Stress of an International Travel

The correct sun protection is one of the most important factors in the prevention of the arise of the skin cancer and other skin diseases. That is why it is important that the cosmetics products have this protection into its formulation. The emulsion containing solar filters gives the product not only hydration functions but also a protection against ultraviolet rays. The protection factor of the emulsions is important to protect the skin against the ultraviolet rays radiation from the sun, it also reduces the chances of appearance of burning and other damages in the skin. The instability of the protection faction in emulsioned systems is a very important parameter to guarantee the protection for the consumer that will be using the product. Objective: This research has as an objective evaluate the different vegetables oils before and after an international travel. Methodology: it was proposed one formulation based on the emulsion, and out of this proposal, it was produced five emulsioned systems with different incorporated vegetable oils. The formulation base was developed containing the same oils and watered faze, it was modified only the vegetable. It was used in the oiled faze three quimic protectors with the protector FPS 25. In this faze was added carrots oil, buriti , rícino coffee and Brazil nuts. The protection factor was evaluated using the Opctometrics equipment and the analyses of each emulsion was made in "triplicata". It was analyzed five emulsions before the international travel. After this analyses, the emulsions were undergone to the different temperatures and pressures of an international travel. However, when they returned to Brazil, after one year, the same emulsions were analysed and through this way it was possible to study the instability of the protection factor of this emulsioned system after an one year-travel. Results and discussions: the majority of the systems didn't suffer great modifications in the protection factor after being undergone into high pressures and huge temperatures modifications of an international travel. The emulsioned systems containing oiled coffee and Brasil nuts

were the ones that had the most meaningful reduction difference of the protection factor. With these results in hand it was possible to conclude that some formulations presented stability in the protection factor, whereas other formulations suffered a reduction in the protection factor. This difference can be divided in the quimic composition the oiled testified and through the interaction with its formulation.

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Development of Transcatheter Heterotopic Valves to Treat Tricuspid Regurgitation

Tricuspid regurgitation (TR) occurs in many individuals and is usually considered mild but severe TR is life-threatening. Even so, many patients with severe TR are denied of the replacement valve surgery because their old age or co-morbidities put them at high risk for conventional open heart surgery. With the advent of transcatheter technology, it is now possible to deliver the valve to the desired location without the need for open heart surgery. However, so far, there has been no commercially available transcatheter tricuspid valve. This may be because of the complex tricuspid valve anatomy and lack of an anchorage zone. Thus, the next best anchorage zone is the vena cava. Placing the valves in the superior and inferior vena cava will prevent the back flow of blood into the venous structures and possible reverse peripheral edema and ascites which are caused by the elevated venous pressure. The hemodynamic characteristics of these valves are tested in a mock circulatory system (MCS) which emulates the physiological pressure and flow conditions in the cardiovascular system. Particle image velocimetry is used to study the flow characteristics in the MCS.

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Cardioprotective Activity of Fruit Extract of Momordica Dioca Roxb. on Isoproterenol Induced Toxicity on Rats

Cardiovascular diseases are the major death causing disease worldwide and identification of herb based therapeutics is the thrust area of current plant research. Present study was undertaken to evaluate the cardioprotective activity of *Momordica dioca* Roxb. (MDR) fruit extract on isoproterenol (ISP) induced cardiotoxicity on rats. The crude methanolic extract of MDR fruit (MEMD) was prepared by soxhlet extraction and fractionated into flavonoid (FFMD) and non-flavonoid (NFFMD). The aqueous extract (AEMD) was prepared from marc. All the extracts were standardized by preliminary phytochemical tests, in vitro antioxidant & free radical scavenging potential. MEMD was evaluated for in-vivo cardioprotective activity against ISP induced cardiotoxicity at three dose levels. The cardioprotective activity was evaluated by serum (CK-MB, LDH and AST) and non serum parameters like endogenous antioxidants (SOD, Catalase, GSH and Lipid peroxidation) and histopathological studies. The rats treated with ISP alone have shown elevated level of serum biomarkers, decreased anti-oxidant system and changes in histology of myocardium. The rats pretreated with MEMD have reversed the toxicity produced by ISP dose dependently. The level of biomarker enzymes were restored to normal by MEMD whereas maximum protection was seen at 400 m/kg. The activity was found to be significant when compared to the standard Vitamin E. The same was observed in endogenous anti-oxidant system as well as histopathological examination. The results reveal the protective effect of MDR fruit on cardiotoxicity induced by ISP. However, further research can be undertaken to reveal the mechanism and phytochemical(s) responsible for the said activity.

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Biochemical versus Molecular Methods in the Detection of Bacterial Contaminants in Some Egyptian Pharmaceuticals in Egypt

Microbial contamination of pharmaceuticals poses a great problem to the pharmaceutical manufacturing process, especially from an economic point of view. Eighty-five pre-used pharmaceuticals collected from random consumers, in Egypt, were examined for the eventual presence of bacterial contaminants. Forty-one bacterial contaminants were isolated from 31 of the tested preparations. These isolates were subjected to biochemical identification by both conventional tests as well as API kits. Among the isolated contaminants, 30 were identified as Gram-positive microorganisms, while the remaining isolates were found to be Gram-negative thin short rods. Only 9 bacterial contaminants were accurately identified to the species level using the employed biochemical methods, whereas the remaining isolates were inconclusively identified or showed contradictory results after using both biochemical methods, and were thus further identified using molecular methods. Out of the latter 32 isolates, 26 were successfully identified to the species level using PCR-based methods. Moreover, PCR assays were compared to standard biochemical methods in the detection of pharmacopoeial bacterial indicators in artificially contaminated pharmaceutical samples. While the biochemical identification of the bacterial indicators using standard methods was completed in 5-7 days, the detection and identification by PCR-based assays were completed within 29-30 hrs. Furthermore, PCR-based methods proved to be more superior regarding cost-effectiveness and sensitivity. In conclusion, since PCR-based methods proved to be more accurate, rapid and cost effective than traditional biochemical methods of identification, the pharmaceutical manufacturers would be advised to adopt PCR-based methods in the microbiological quality testing of pharmaceuticals in the future.

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Antioxidant Activity and Hepatoprotective Potential of Azolla Microphylla Phytochemically Synthesized Gold Nanoparticles on *Cyprinus Carpio* L. in Vitro and in Vivo

Hepatic disorder remains a serious health problem and even death, and is caused by excess consumption of alcohol, high doses of acetaminophen, chemotherapeutic agents, hepatitis viral infection, dantrolene sodium, valporic acid, peroxidised oil and isonicotinic acid hydrazide, etc., Medicinal plants are frequently considered to be less toxic and free from side-effects than synthetic drugs. The search for bioactive compounds of plant origin with potent hepatoprotective activity has become a central focus for study of hepatoprotection today. Azolla is a genus of small aquatic fern that is found in the temperate and tropical regions of the world. Azolla microphylla is one of the species from the genus Azolla; it is pteridophyte plantae belongs to the Salviniaceae family. It is phytochemically reported to be rich in proteins, vitamins, alkaloids, flavonoids and anthroquinone glycosides. Flavonoids have long been known to exhibit a strong antiproliferative, hepatoprotective activities and scavenge formation of free radicals during various biological functions and prevent cell damage and cell lysis. For the first time rutin and quercetin were isolated and purified from Azolla microphylla in our laboratory. The antioxidant potential of the plant hepatoprotectors is an important factor in the phototherapy of acetaminophen induced liver disfunction because acetaminophen toxic (N-acetyl-p-benzoquinoneimine) metabolite leads to oxidative stress by enhancing free-radical oxidation processes and destroys the hepatocellular antioxidant protection system. Phytochemically synthesized green gold nanoparticles provide strong platform in medical diagnostics and therapeutics. The green synthesized gold nanoparticles using the methanol extract of Azolla microphylla were analyzed for molecular size, shape and involvement of bioorganic compounds by UV-Spectroscopy, FTIR, FESEM, UHRTEM, XRD, EDX and TG-DTA. In-vitro hepatoprotective and antioxidant effects of green

synthesized gold nanoparticles were assessed using carp fish primary hepatocytes. The primary hepatocytes were exposed with green gold nanoparticles and acetaminophen with different treatment conditions and measure the hepatotoxic markers. In-vivo effects of green synthesized gold nanoparticles were analysed using carp fish, dividing in to six experimental groups (n=6 each). The effects of green synthesized gold nanoparticles individually or in combination with acetaminophen were analysed for 24h with control and experimental fish. At the end of 24h treatment, effects on liver and blood biochemicals, hepatotoxic and oxidative stress markers were assessed to evaluate the therapeutic effects of gold nanoparticles.

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Preactivated Thiomers for their Potential in the Treatment of Dry Mouth Syndrome

Purpose: This study was aimed to investigate preactivated thiomers for their potential in the treatment of dry mouth syndrome.

Methods: Accordingly, chitosan-thioglycolic-mercaptocotinamide conjugates (chitosan-TGA-MNA) were synthesized by the oxidative S-S coupling of chitosan-thioglycolic acid (chitosan-TGA) with 6-mercaptocotin amide (MNA). Unmodified chitosan, chitosan-TGA (thiomers) and chitosan-TGA-MNA conjugates were compressed into test discs to investigate cohesive properties, cytotoxicity assays and mucoadhesion studies.

Results: Due to the immobilization of MNA, the chitosan-TGA-MNA conjugates exhibit comparatively higher swelling properties and cohesive properties corresponding unmodified chitosan. On the rotating cylinder, discs based on chitosan-TGA-MNA conjugates displayed 3.1-fold improved mucoadhesion time compared to thiolated polymers. Tensile study results were found in good agreement with rotating cylinder results. Moreover, preactivated thiomers showed higher stability. All polymers were found non-toxic over Caco-2 cells.

Conclusion: On the basis of achieved results the preactivated thiomeric therapeutic agent seems to represent a promising generation of mucoadhesive polymers which are safe to use for a prolonged residence time to target the mucosa requested for dry mouth syndrome.

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In Vitro Safety Evaluation of Caffeic Acid

Phenolic compounds are abundant in the Brazilian plant kingdom and they are part of a large and complex group of organic substances. Cinnamic acids are part of this group of organic compounds, and caffeic acid is one of the representatives. Besides powerful antioxidant activity, increasing collagen production and prevent premature aging, caffeic acid has demonstrated antimicrobial activity and may be promising in the treatment of dermal diseases. One of the applications of caffeic acid is in emulsions, which are widely used by consumers for pleasant and refreshing sensory, but few studies have related the efficacy and safety of these products on the skin. The relevance of this study is based on evidence and to clarify the cytotoxic potential of this substance by preliminary studies in vitro. The cytotoxicity evaluation was done using the MTT method (3-(4,5-dimethyl-2-thiazolyl)-2,5-diphenyl-2H-tetrazolium bromide), colorimetric assay which determines the amount of insoluble crystal violet staining formed by reaction of reduction of MTT in living cells. A dose versus response curve was constructed, and it was possible to use the equation to determine the IC₅₀ of caffeic acid or the product concentration needed to cause 50% lethality of the cells. The results are promising since caffeic acid concentration that inhibited the growth of 50% of HepG2 cells (IC₅₀=781,8µg/mL) is approximately 330 to 400 times greater than the concentration required to inhibit 50% DPPH radical scavenging (IC₅₀ DPPH= 2,39 µg/mL) and ABTS (IC₅₀ ABTS= 1,96 µg/mL) respectively. The maximum concentration of caffeic acid tested (1140 mg / mL) did not reach 50% cell death in HaCat cells. For the cytotoxicity assay, it was concluded that the caffeic acid does not have toxicity in HepG2 and HaCat cells on the concentration required to have antioxidant activity in vitro, and it can be applied in topical products.

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Glycemic control with Intensive Insulin Treatment fundamental to Fundamental to Renal Preservation in Diabetes

Diabetes is the most common cause of end stage renal disease (ESRD). Previous studies imply that angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocking (ARB) drugs contribute to prevalence of ESRD in diabetes. This study investigates renal preservation in diabetes by intensive insulin therapy. 46 adult diabetes patients, 28 females and 18 males were studied for mean 14.2 months (1.5-115 months). Diabetes was diagnosed by 2h postprandial glucose of ≥ 200 mg/dl (11.1 mmol/L) and treated by Glargine or detemir insulin administered after breakfast and dinner, with regular insulin by finger stick glucose 2h post meal and bedtime. Blood pressure (BP) was controlled with anti-hypertensive therapy excluding ACEI/ARB drugs. Glucose, serum creatinine (Scr), estimated glomerular filtration rate (eGFR) and glycosylated hemoglobin (Hba1c) at first and last visits were obtained. BP was recorded in both visits. Results were compared between first and last visits. A paired two-tailed test $P < 0.05$ was significant. Patients were divided by 2hPP glucose of ≤ 11.1 mmol/L. Glucose at last visit was significantly lower (8.4 ± 0.6 mmol/L) than first visit (10.3 ± 0.7 mmol/L) in all patients group associated with significantly reduced Scr in last visit (100.3 ± 5.2 μ mol/L) compared to first visit (110.9 ± 7.8 μ mol/L). No changes in eGFR were noted between first and last visits. Significant reduction of Hba1c (9.14 ± 0.52 v $7.60 \pm 0.45\%$, 0.0148) was found in less than 11.1 mmol/L group. BP's were normal ($<140/80$ mmHg) in both visits in all groups. The paradigm of therapy presented in this study is proven effective in renal preservation in diabetes.

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Starch Pickering Emulsion: A Safe Vehicle for Topical Drug Delivery

Water in oil emulsions are complex multiple-phase systems. These emulsions are thermodynamically instable systems exposed to physical, chemical and microbiological influences during manufacture, transport, storage and use. On the other hand most preservatives and surfactants present adverse effects that should be avoided. Therefore, a self-preserving and a free surfactant topical emulsion formulation present obvious technological, safety and economic advantages.

The present study was conducted in order to characterize physical and chemically a preservative-free and surfactant-free w/o emulsion for topical application and to evaluate its safety profile.

A preservative- and surfactant-free w/o semi-solid emulsion intended for topical application was prepared using a modification of a cold emulsification process, as described elsewhere. The emulsion contains well-known pharmaceutical excipients: including ca. 50-70% lipid and 30-40% aqueous phase and 1-10% thickener agent. Oscillatory and steady state shear measurements were performed for angular frequencies between 1 and 100 rad s⁻¹ and shear rates between 1 and

1000 s⁻¹, for two different temperatures, 25 and 37 °C, and the emulsion was examined by bright field light microscopy.

Stability studies included the storage of emulsion at room temperature and at 40°C (stress test). The antimicrobial activity was performed according to a modification of membrane filtration method described in the Ph.Eur. (6.1.3.). The antimicrobial activity of the emulsion was evaluated during 28 days.

In order to predict the cutaneous irritation to the emulsion the cell viability was evaluated using Df and HaCaT cell lines in a MTT and Alamar Blue assays.

A HRIPT was used to study the irritancy and sensitizing potential of emulsion in 53 volunteers.

For the emulsion, G' was must higher than G'' , meaning a dominant elastic behavior and the steady state shear viscosity decreases with the increase of the shear rate, showing a shear-thinning behavior. G' and G'' also decreased with the increase of the temperature, as expected. The slope of the curve G' vs $\dot{\gamma}$ was very small meaning that the system is well structured. The microstructure is related to the rheological behaviour in relation to particle size, shape and distribution.

The antimicrobial activity was dependent on the type of microorganism and temperature of storage, all samples complied with the A criterium for bacteria and fungi and B criterium for yeasts according to Ph.Eur specifications. Storage at 40°C was unsuitable for microbial growth.

The emulsion showed no cytotoxicity. Under experimental conditions adopted repeated applications of emulsion diluted at 5% in water in semi-occlusive patch with a panel of 53 volunteers, did not induce any irritative reaction, showing that this product show very good skin compatibility (Induction phase). Moreover, the repeated applications did not induce any allergic reactions (Challenge phase).

The study confirms that starch pickering emulsion presents a well structure system with a safe profile. The use of appropriate excipients allows preparing w/o emulsions with the obvious advantages of avoiding the adverse effects often associated with antimicrobial preservatives and surfactants agents.

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Effects of ovariectomy on the bone structure and bone turnover in diabetic female rats

Osteoporosis is a common bone disease that affects women after menopause. Deficiency of the female hormone 17- β estradiol, caused either by the menopause or ovariectomy, results in accelerated bone loss and bone mass decline. Additionally changes in the microstructure of the bone tissue, particularly of the trabecular bone results in an increased risk of fractures. Osteopenia is recognized in diabetic patients but there is some controversy about the effects of diabetes mellitus on bone remodelling. The degree of bone loss differs between type 1 and type 2 diabetes (Vestergaard, 2007). In some studies, type 2 diabetes has been associated with an increase in bone mineral density in post-menopause women (Rubin et al., 2013).

Our aim was to compare the effects of reduced levels of estradiol (E2), induced by ovariectomy, in bone structure and bone turnover, both in healthy and diabetic type 2 female Wistar rats. Three month-old animals were randomly divided into four equal groups as: control (C); ovariectomized (OV); diabetes mellitus induced by single (i.p.) low dose of streptozotocin (DM); diabetes mellitus + ovariectomized (DM+OV). Serum glucose, triglycerides, cholesterol, calcium, E2, CTX, and PINP concentrations were estimated by standard methods in blood samples collected on day 56 after ovariectomy. Bone vertebral microarchitectural structure was observed by histomorphometry. Body weights variation were also evaluated. Data were analyzed using

mann-whitney non-parametric test (statistical significance was considered at 0.05 level).

Glucose and triglycerides serum levels were higher in diabetic animals ($p < 0.05$). A significant increase in bone turnover was observed in the ovariectomized rat groups (OV and OV+DM) ($p < 0.05$) when compared to the control (C), but not between diabetic (DM) and control (C). The ratio PINP/CTX was significant higher in the diabetes mellitus group (DM) when compared to the ovariectomized group (OV) and to the control group ($p < 0.05$) pointing to an unbalance between formation and resorption, favoring formation. A similar trend was observed in the diabetes mellitus + ovariectomized (OV+DM) group. The histomorphometric studies were consistent with these results. These findings suggest that diabetic rats were less prone to bone fragility when exposed to ovariectomy compared to non-diabetic female ovariectomized rats and are consistent with the studies that refer an increase in bone mineral density in type 2 diabetic women with osteoporosis.

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Formulation and Evaluation of Dual Drug Conjugate Loaded Nanoparticles for the Treatment of Cancer

Two antineoplastic agents, Imatinib (IM) and 5-Fluorouracil (FU) were conjugated by hydrolysable linkers through an amide bond and entrapped in polymeric Human Serum Albumin (HSA) nanoparticles. The presence of dual drugs in a common carrier has the advantage of reaching the site of action simultaneously and acting at different phases of the cell cycle to arrest the growth of cancer cells before they develop chemoresistance. We have demonstrated an enhanced anticancer activity of the conjugate, free drug forms and the drug loaded stealth HSA nanoparticles (NPs) on A-549 human lung carcinoma cell line and Zebra fish embryos (*Danio rerio*). Hydrolysability of the conjugate was also demonstrated and complete hydrolysis was observed after 36 h. The other parameters evaluated were particle size (86nm), Poly Dispersive Index (PDI) (0.209), zeta potential (-49mV), drug entrapment efficiency (96.73%) and drug loading efficiency (89%). Being in stealth mode gives the potential for the NPs to evade Reticulo-Endothelial system (RES), achieve passive targeting by Enhanced Permeation Retention (EPR) effect and controlled release of the therapeutic agent. As the conjugate will cleave into individual agents and resume activity in tumor environment, delivery of dual drugs promises better suppression of cancer chemoresistance by delivering two drugs with different modes of action at the same site of action and thereby synergistically inhibiting the growth of cancerous tissue.

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A National Profile of Deliveries by Women with Intellectual Disabilities in the US: Maternal Characteristics and Pregnancy Outcomes

We used the 2010 Nationwide Inpatient Sample to examine pregnancy outcomes. Compared to other women, those with IDD were younger, more likely to be Black and have Medicaid and less likely to be Latina. They had longer hospital stays, were more likely to have a range of adverse pregnancy outcomes and were less likely to have Caesarean deliveries compared to other women. Further research should explore the determinants and develop interventions to improve these outcomes.

Summary

Background & objectives: Ongoing deinstitutionalization has led the overwhelming number of US women with intellectual and developmental disabilities (ID) to live in the community today. As eugenic sterilization and segregation practices have eroded, births among women with IDD have increased. Researchers have investigated the parenting experiences and quality of these women, but there are no population-based studies in the US about their pregnancy outcomes. Four smaller studies from Australia, the UK and Sweden found elevated risk of adverse outcomes for mothers with IDD and their newborns. Women with IDD likely require additional support to have healthy pregnancies and deliveries, but there is no empirical evidence to begin to guide interventions. The two aims of this study were therefore (1) to characterize the population of US women with IDD who had hospital-based deliveries and (2) to determine their pregnancy and childbirth outcomes.

Methods: We identified women with IDD using ICD-9 codes in the 2010 Nationwide Inpatient Sample of the Healthcare Cost and Utilization Project. These data are sponsored by the Agency for Healthcare Research and Quality and cover 97% of the US population. The NIS is the largest publicly-available, all-payer inpatient care database in the United States. It contains data from approximately 8 million hospital stays each year. We compared the prevalence of deliveries among these women to the general obstetric population including length of hospital stay and mode of delivery (vaginal versus Caesarean). Finally, we also contrasted the weighted prevalence of adverse pregnancy outcomes including pre-eclampsia, early labor, preterm birth, and late fetal death.

Results: The sample included 340 women with IDD, which represented a weighted total of 1,705 US deliveries in 2010 to women with IDD (fewer than one percent of the 3.9 million total US births that year). Compared to other women, those with IDD were younger, more likely to be Black, less likely to be Latina and more likely to have Medicaid insurance pay for their hospitalization. Ninety-nine percent of women with IDD had complicating conditions, compared to 94% of other women. Women with IDD had longer hospital stays and were less likely to have Caesarean section deliveries in contrast to women without these conditions. Rates of adverse pregnancy outcomes were elevated among the women with IDD, across a range of measures. Women with IDD were more likely to have early labor, preterm birth, pre-eclampsia and other hypertensive conditions, and late fetal death or stillbirth. There were no differences between the two groups of women in maternal death rates, which is relatively rarer in the US.

Implications: Women with IDD comprise fewer than 1% of deliveries in the United States, but they and their infants are at significantly elevated risk of adverse outcomes. The public health costs of these outcomes are likely to be substantial. Further research is needed to understand the determinants of these adverse pregnancy outcomes. However, pending further evidence, health care providers are advised that their patients with IDD are at elevated risk of serious pregnancy complications. Intervention to improve these outcomes are needed.

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Scale Up of a Low Energy Process for the Production of Oil in Water Emulsions Containing Mometasone Furoate

Consistent with the technological advancements during the past 10-15 years, numerous formulations and drug delivery concepts emerged for enhanced therapeutic applications. Because these formulations are relatively new, the industry needs to address several challenges and the interface between formulation science and engineering will continue to be at the frontier of new product development [1]. To overcome this drawback, cold processed emulsions can be used. As they are easier to process due to the elimination of the phase of heating and cooling down, the time of production can be decreased, increasing production capacity [2].

The scale-up stage comprises the integration of the previous phases of development, as well as the transfer of technology to fabricate a given product.

A scale-up procedure based on a well design and prepared technical transfer will assure the quality of the product, an overall economy of resources and a timely and readiness achievement of the markets [3, 4].

The aim of the present work is to study the risk associated to the scale transposition of a cold processed oil in water emulsion and access the production costs savings associated to this new process.

The lab scale of the cold processed emulsion was developed by the preparation at room temperature of an oil liquid phase, achieved by dissolving the bis-PEG/PPG-16/16 PEG/PPG-16/16 dimethicone (and) caprylic/capric triglyceride (5 % w/w) and the co-emulsifier (PEG-20 glyceryl laurate, 4 % w/w) into the oils (C12-15 alkyl benzoate, 5% w/w and isopropyl myristate, 5% w/w) and mixing (HelipathR 130 rpm) at room temperature for about 30 minutes. Next, an aqueous phase was prepared at room temperature by dispersing the aqueous thickening agents (HPMC, 2% w/w and PVM/MA, 0.3 % w/w) in water. The cetrimide at 0.075 % w/w and the pentanediol (10% w/w) were added to the aqueous solution and the resulting mixture was

homogenized until a clear homogeneous gel was achieved. The emulsification phase was performed at room temperature by slowly adding the oil phase to the aqueous phase with high shear mixing at a rate about 12800 rpm/min (IKAR T25 Ultra Turrax).

Two scales up were performed, a pilot lab-scale and a pilot industrial-scale. In the first one the volume of the lab scale was increased in ten-fold using a miniplant reactor system (IKA® LR 2 ST) and in the second one the volume of the pilot lab-scale was increased in ten-fold using a Dumek® Dumoturbo 25.

The three scales were compared in terms of droplet size distribution measured by light scattering using a Malvern Mastersizer 2000 and the rheological profiles were determined using a Brookfield® viscometer.

The cold process used to produce the emulsion in the pilot industrial-scale was compared with a conventional hot process considering that, after the introduction of the water phase, the reactor is heated to 80 °C; the oil phase is heated, prior the introduction in the reactor, to 80 °C and after the homogenization of both phases, the reactor is programmed to decrease the temperature to 25 °C which takes approximately 1 h considering 15.000 g of product. The total production costs were calculated taking into account the electrical and water costs.

The results showed that the droplet size of the emulsion significantly decreased when the production scale was increased ($23.23 \pm 3.89 \mu\text{m}$; $18.42 \pm 5.76 \mu\text{m}$ and $6.37 \pm 2.49 \mu\text{m}$, for lab, pilot-lab and pilot-industrial scale, respectively). Moreover, the industrial pilot-scale produced an emulsion with a monomodal population. The apparent viscosity values are in accordance with the latter results. The emulsion produced in the industrial pilot-scale seemed to be more structured.

These results were related to the type of homogenizer of the different equipments. In the lab-scale, it was used manual agitation followed by rotor stator homogenization, in the pilot lab-scale the homogenization was achieved using an anchor stirrer and in the pilot industrial-scale a turbine stator and a universal rotor helix shaped.

The new cold process method allowed a decrease in the total production costs of more than 17%. These differences arise from the equipment costs per hour in terms of water and electrical costs, reactor amortization and human resources costs per hour. As the production is faster the costs related to human resources are lower and the amortization of the equipment decreases as more batches are produced.

In conclusion the scale-up process led to more significant alterations on the rheological profile and on the droplet size distribution of the placebo produced by the industrial-scale than the lab-scale production. This cold process allowed a total production savings of more than 17% when compared to the traditional hot process.

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Modulation of Diabetes and Dyslipidemia in Diabetic Insulin-Resistant Rats by Mangiferin: Role of Adiponectin and TNF- α

Background: Mangiferin (MA) is an active xanthone glycoside present in *Mangifera indica* bark. It was reported to produce hypoglycemic and antidiabetic activity in KK-Ay mice, an animal model of genetic type 2 diabetes and in streptozotocin diabetic rats. Its effect on diabetic insulin-resistant animals has not been investigated.

Aim of work: The current work aimed to explore the effect of mangiferin, on diabetic insulin-resistant rats in an experimental model of type 2 diabetes.

Methods: To achieve this diabetes was induced in rats by a high-fat/high fructose diet and a low dose of streptozotocin (HF/FrD/STZ). Treatment with mangiferin (20 mg/kg i.p.) started after one week of STZ injection and continued for 28 days. On the 14th and 28th day of treatment rats were sacrificed and pancreatic β -cell function was assessed by measuring serum glucose, insulin levels and HOMA-index. Liver glycogen and lipid profile in serum (TG, TC, LDL-C, and HDL-C) and hepatocytes (TG and TC) were probed. Besides, the level of adiponectin and TNF- α in serum, as indicators of insulin resistance, were revealed. Rosiglitazone, an antidiabetic insulin sensitizer that also improves lipid profile in patients with non alcoholic fatty liver disease (NAFLD) was used as a reference drug.

Results: Administration of HF/FrD/STZ to rats induced obese, hyperglycemic, insulin resistant diabetic animals. This was accompanied by dyslipidemia, and a decrease in liver glycogen. Mangiferin opposed these effects and was shown to be an effective antidiabetic besides improving lipid profile. Insulin sensitivity was improved partly by modulation of pancreatic β -cell function, reducing liver glucose output and by regressing the imbalanced production of the adipokines TNF- α and adiponectin.

Conclusion: The results obtained in this study provide evidence that mangiferin is a possible beneficial natural compound for type 2 diabetes and metabolic syndrome. This effect is mediated through improving insulin sensitivity, modulating lipid profile and reverting adipokine levels to normal.

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Teenage Pregnancy Prevention in Canada, Greece, Philippines, and the United States: Evaluation of an Evidence-Based Intervention to Reduce Risky Behaviours and Promote Abstinence and Health in Teenagers

Background: Global trends indicate high rates of teenage pregnancy in the United States. Teenage birth rates are higher in USA than Canada and Greece. Teenage pregnancy rates are increasing in the Philippines. High rates of risky behaviors exist among teenagers including drug/alcohol use, sexual activity leading to STD's/HIV and pregnancy. This presentation describes: global perspectives on teenage pregnancy prevention and interventions to reduce risky behaviors/teenage pregnancy in USA/other countries; outcomes of teenagers in an evidenced-based intervention that aims to reduce risky behaviors/promote abstinence; and compares intervention and comparison participant outcomes. Bandura's Social Learning theory guided the intervention on sexuality discussions, mentoring, health/fitness classes, cultural events, community service, and recognition.

Methods: Pretest post-test design. Sample: high-risk, primarily African-American 6th to 8th graders in four intervention (n=388; 223 girls/165 boys) and five comparison (n=309; 151girls/158 boys) schools. Intervention participants were randomly selected. Comparison participants were convenience sample. Intervention/comparison schools were matched on demographic variables. Measures: AFL Core Baseline/Follow-up and Demographic Questionnaires. Analyses: Pearson Chi Square and Mann Whitney U Tests. Level of significance was .05. Results: Abstinence education, comprehensive sex education, health promotion are used to prevent teen pregnancy in USA/other countries. Post-test II

Results: Significantly more intervention than comparison participants said: no to wrong activities (p=.003); stayed away from trouble (p=.007); important to remain abstinent (p<.001) and future spouse remain abstinent (p<.001); abstinence avoids pregnancy/STD's/health problems (p=.047);

Significantly more intervention girls than boys reported: asking parents dating/alcohol/drug questions (p=.001); saying no drinking/drugs/sex (p=.01); remaining abstinent until marriage (p<.001); problem with sex even when no pregnancy results (p=.001). More

comparison than intervention participants reported: drinking ($p < .001$); friends drink ($p < .001$); used marijuana/drugs ($p = .001$); sex okay if dating long time ($p = .045$).

Conclusion: Intervention participants have more significant outcomes related to abstinence behaviors/attitudes than comparison participants. Findings suggest the intervention promotes abstinence, reduces risky behaviors, helps prevent teenage pregnancy/health problems. Findings have implications for practice, education, research on effective interventions for preventing pregnancy and promoting sexual health in teenagers.

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UPLCMS Method Development and Validation of Tablet Dosage form Containing Amlodipine, Hydrochlorothiazide and Losartan Using Internal Standard

A simple, rapid, sensitive and specific Ultra performance liquid chromatography-tandem mass spectrometry method was developed and validated for simultaneous estimation and validation of tablet dosage form containing amlodipine (AMLO) hydrochlorothiazide (HCT) and losartan (LOSAT) using telmisartan (TELM) as an internal standard (IS). The chromatography separation was achieved with Waters ACQUITY BEH C18, 1.7 μm , 2.1X50 mm column with mobile phase containing acetonitrile (A) & 1% ammonium acetate (B) pH adjusted to 2.8 with trifluoro acetic acid with gradient mode (2 min: 98% A : 2% B, 2-4 min: 24% A : 76% B, 4-5 min, 50% A : 50% B, 8-10 min 2% A: 98% B). The flow rate was 0.4 mL min⁻¹ column maintained at 250C and the injection volume was 2 μl . The selected chromatographic condition was found to be eluted amlodipine hydrochlorothiazide and losartan with retention time of 3.7, 2.5 and 3.9 min, respectively. The proposed method was found to be rectilinear over the range of 50-300 ng mL⁻¹, 125-750 ng mL⁻¹ and 500-3000 ng mL⁻¹ of AMLO, HCT and LOSAT respectively. The signal intensities obtained in ion mode for amlodipine, hydrochlorothiazide and losartan was found to be much higher positive ion mode (M⁺)- parent ion at m/z, 409.02, 297.97 and 422.91 and telmisartan (IS) were higher in positive ion mode (M⁺H)⁺ parent ions at m/z 515.03, respectively, in QUATTROZQ full scan mass spectra. The present method was validated as per ICH guidelines with respect to precision, specificity, linearity, limit of detection, limit of quantification, accuracy, and robustness and it can also be used for routine quality control analysis of these drugs in biological samples either alone or in combined pharmaceutical dosage forms.

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Short-Term and Long-Term Survival Probabilities in First-Ever Stroke Patients

Introduction: Stroke has become a burden and an important public health problem to the health care providers and to the society. It is projected that in 2020, stroke will be the second leading cause of death and disability worldwide. Few studies are known to identify the survival probabilities in different periods of time.

Objective: This study was aimed to determine the 31-day, 1-year and 5-year survival probabilities in first-ever stroke patients.

Methods: A retrospective record review study was conducted among 613 first-ever stroke patients admitted to the Hospital Universiti Sains Malaysia, Kelantan, Malaysia. Data was extracted from medical records from 1st January 2005 until 31st December 2011. The Kaplan-Meier product limit survival curve was applied to determine the 31-day, 1-year and 5-year survival probabilities. Log-rank test was used to test the equality of survival time between different groups.

Results: A total of 149 patients died during the study period. The 31-day, 1-year and 5-year survival probabilities were 76.2%, 72.9% and 70.4% respectively. There were significant differences of survival time based on types of stroke, Glasgow Coma Scale, level of consciousness, atrial fibrillation, fasting blood glucose, systolic blood pressure and diastolic blood pressure. There were no significant differences of survival time based on smoking status, age at the time of diagnosis and gender.

Conclusions: This study provides added information on effect of various clinical and socio-demographic characteristics on survival time of first-ever stroke patients. Further study should be considered to implement in addressing the prognostic factors of first-ever stroke patients.

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Novel Curcumin Analogs Modeling, Synthesis, Tubulin polymerization and Cytotoxic assays

Background: Curcumin [1,7-bis(4-hydroxy-3-methoxyphenyl)-1,6-heptadien-3,5-dione] is the major constituent of turmeric powder extracted from the rhizome of the plant *curcuma longa*. Extensive research conducted within the past years has revealed that curcumin is a highly pleiotropic molecule that modulates and interacts with a diverse range of molecular targets and hence it possess anti-proliferative activities against tumor cells in vitro, anti-inflammatory, antibacterial, antiviral, anti-hepatotoxic, hypotensive and anti-cholesterolemic activities. Since cancer is a result of the dys-regulation of multiple cell signaling pathways so curcumin's multi-targeting ability may be the key to its therapeutic potential against cancer. Also the great similarity in structure between curcumin analogs and chalcones inspired their testing against tubulin enzyme activity. Recent research revealed that chalcones possess cytotoxic activity associated with tubulin inhibition and interference with microtubule formation, which is essential in cellular processes such as mitosis and cell replication. Aims: Novel Curcumin analogs were designed, synthesized and tested for their antitumor activities. Also in silico and in vitro studies has been performed to predict the binding affinity of the target compounds and to test their ability to inhibit tubulin assembly and act as microtubule destabilizing agents. Methods: Analogs Ia-g, IIa-d, IIIa-d and IVa-e represent four different series of compounds designed and synthesized with 3,5-dibenzylidenepiperidin-4-one core moiety.

Results: Compounds showed interaction energy comparable to or within the range of podophyllotoxin itself when docked into the colchicine binding site of tubulin using the podophyllotoxin-tubulin complex (PDB 1SA1). Conclusion: Acylation of N-piperidone ring and the use of medium sized ester or ether groups at position 4 and the presence of halogen atom at position 5 of both benzylidene rings, greatly enhanced the binding affinity of such analogs. Results of these compounds could be used for further future development to obtain more potent analogs.