Misr University for Science and Technology
College of Pharmaceutical Sciences & Drug Manufacturing

International Conference of Pharmaceutical Sciences (ICPS)

“Future Trends and Innovations in Pharmacy”

October 27th-28th 2018
Hilton Pyramids Golf
Giza, Egypt

Under Patronage of

Mr. Khalid Eltoukhy

Chancellor, University Board of Trustees

Prof. Dr. Mohamed El-Azzazi

University President

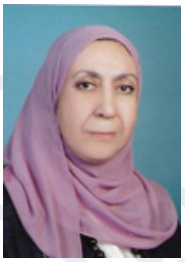
In Honour & Memory of Dr. Souad Kafafi

The International Conference of Pharmaceutical Sciences-MUST is dedicated to the memory of Dr Souad Kafafi (1928-2004), the founder of Misr University for Science and Technology (MUST). Dr Souad Kafafi was one of the pioneers in the history of private higher education in Egypt. Her great achievements in science and education are still fruitful to MUST staff and students. Dr Souad's ambition, commitment and finite accuracy were the keys to her success. Being one of the educational leadership role models, Dr Souad was concerned with the development and improvement of education at MUST to levels of the world's top universities academic ranking. Even after her demise, her mission is continually fulfilled with the graduation of several generations of highly qualified pharmacists holding reputable positions in different pharmaceutical work fields. In continuance of her journey for development of education in general and science in particular, College of Pharmaceutical Sciences and Drug Manufacturing is honored to hold its international conference in her memory.

Conference Committees

Conference Planning Committee

Prof. Dr. Mohamed Mohsen Ismail
Conference Chair, Dean, College of Pharmaceutical Sciences and Drug Manufacturing



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Dr. Amira Beshir	Department of Clinical Pharmacy
Dr. Ahmed Adel	Department of Pharmaceutics
Dr. Menna Abd El-latif	Department of Industrial Pharmacy

Abstract

Dr. Amira Beshir	Department of Clinical Pharmacy
Rofida Saad	Department of Pharmaceutics

Poster session

Dr. Amira Beshir	Department of Clinical Pharmacy
Dr. Ahmed Adel	Department of Pharmaceutics
Dr. Menna Abd El-latif	Department of Industrial Pharmacy
Mahmoud Tahan	Department of Industrial Pharmacy

Organizing Committees

Conference book

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Dr. Marwa Mohaned	Department of Biochemistry
Dr. Nermeen Zakaria	Department of Biochemistry

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Reham Osman	Management Development Center (Design)
Mahmoud Tahan	Department of Industrial Pharmacy
Said Zayed	Designer

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Mohamed Magdy	Dean Office Director

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Public Relations

Dr. Tarek Attia	Public Relations Director, MUST
Shireen Soliman	Public Relations, MUST

Contents

Preface

Misr University for Science and Technology (MUST) is a major Egyptian comprehensive private University since 1996. From its central campus in the Sixth of October City, the University serves the entire country as a major educational institution. The College of Pharmaceutical Sciences and Drug manufacturing, MUST University is honoured to organize its first International Conference of Pharmaceutical Sciences (ICPS) Entitled "Future Trends and Innovations in Pharmacy" in October 27th and 28th, 2018. Under the patronage of Mr. Khalid Eltoukhy, Chancellor, MUST Board of Trustees and Prof. Dr. Mohamed El-Azzazi, MUST President, the conference takes place at Hilton Dream, 6th of October City. This conference book includes the agenda, main scope and topics covered in the conference, Keynote speakers' biographies and abstracts of their distinguished lectures. Moreover, it includes the abstracts of all research topics and posters that are presented during the conference.

About the Conference

Pharmaceutical sciences combine a wide range of scientific disciplines that are critical for the discovery and development of new drugs and therapies, with the ultimate goal to improve public health and quality of life. Considering this mission, College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology welcomes you to the International Conference of Pharmaceutical Sciences (ICPS) "Future Trends and Innovations in Pharmacy" in October 27th and 28th, 2018. The conference take place at Hilton Pyramids Golf, 6th of October City. The scientific program includes keynote lectures by international and Egyptian leading experts as well as poster presentations and workshops. It is a great opportunity to gather pharmaceutical researchers, academics, marketing people, industrial pharmaceutical executives and governmental policy makers from different countries to share their practical experiences, inventive ideas and collaborations across industry, practice and academia. We are looking forward to your participation at this unique event, which emphasizes intergenerational continuity and interdisciplinary research.

Preface

1. Pharmacy and Medicine Optimization
2. Interprofessional Education and Integrated Learning
3. Research Innovations
4. Treatment Innovations
5. Pharmacoeconomics
6. Biosimilarity and Bioequivalence

Welcome Speech

It is a great pleasure and honor for me to declare open the 1st international scientific conference of the college of pharmaceutical sciences and drug manufacturing and to welcome you all at the opening ceremony. To our eminent speakers and delegates who have come, I bid you a very warm welcome.

We are indeed honored to have you here with us. We have about 300 Participants gathered here today, making our conference a truly international one. At the first wish to convey to you the greetings of Mr. Khaled El-Toukhy chancellor of Misr University for Science and Technology for him I wish to express my great appreciation and sincere gratitude. Indeed, this conference would never have started without his valuable support.

We have with us today representatives from research organizations, universities as well as other research agencies. I hope that this two-day conference will be a very good opportunity for academics and researchers to share their ideas and views on common research integrity issues. A diverse range of interests and topics in pharmacy will be covered. A special emphasis is given to recent advances in drug discovery, pharmacy and medicine optimization, research innovations, treatment innovations, inter-professional education and integrated learning and pharmacoeconomics.

I would like to deeply thank the organizing committee and all of our colleagues. We can't forget to offer a particular thanks to our generous sponsors and very much appreciate their valuable help. I wish the conference would be successful and reach its goals and I hope all of our guests and participants enjoy this event and we are proud of being with you all.

To everyone who participates in this conference I am indeed very thankful

With my best wishes,

M. Mohsen Ismail

Prof. Mohamed Mohsen Ismail
Chairman of the Conference
Dean of College of Pharmaceutical Sciences and Drug Manufacturing
Misr University for Science and Technology

KEYNOTE SPEAKERS

PROF. DR. MAGID ABOU-GHARBIA

Associate Dean for Research, Laura H. Carnell Professor of Medicinal Chemistry, Director of Moulder Center for Drug Discovery, School of Pharmacy, Temple University, USA

Biography

Magid Abou-Gharbia, Ph.D., FRSC is currently the Associate Dean for Research, Laura H. Carnell Professor of Medicinal Chemistry and Director of the Moulder Center for Drug Discovery Research (MCDDR) at the School of Pharmacy, Temple University, Philadelphia, PA. He is responsible for Setting and implementing School of Pharmacy research strategies to bridging preclinical research with clinical research "from Bench to Patient-Bedside" and promoting the school's research and entrepreneurial enterprise. Dr. Magid spent 26 years at Wyeth Pharmaceuticals where he was Senior Vice President Discovery Research. He was responsible for overseeing and directing Wyeth chemistry and screening research efforts of 500 scientists at four US research facilities and 150 chemists in Hyderabad, India in support of drug discovery in Neuroscience, Inflammation, Women's Health/Bone, Oncology and Cardiovascular/Metabolic Diseases therapeutic areas. Dr. Abou-Gharbia led research efforts that resulted in the Discovery of 9 marketed drugs across multiple therapeutic areas. Mylotarg, Torisel, Bosulif and Neratinib, for the treatment of cancer and they have increased the life expectancy of patients in need. Other drugs include for treatment of osteoporosis (Combriza), depression (Effexor, Pristique), insomnia (Sonata), and bacterial infections (Tygacil). Dr. Abou-Gharbia is credited with more than 125 US patents, over 350 worldwide Patents, 325 publications, invited lectures and presentations. In 1998, he was identified by the US Patent & Trademark office as one of the most Prolific Inventors of the Decade 19871997-. Dr. Abou-Gharbia has also been instrumental in establishing and promoting biomedical research in the US, Middle East, Italy and India. In addition, he continues to welcome and host visiting scholars, faculty, and students in sabbaticals, internships, and fellowships in his laboratories to further boost biomedical research in the region through training in modern drug discovery approaches. His efforts led to the launch of several key ACS initiatives such as: initiating ACS Heroes of Chemistry in 1996, Pharma Leadership meeting in 2003 and holding a joint event between ACS Med Chem Division and EFMC in 2006. These activities are currently being held on an annual basis. Dr.Abou-Gharbia is a Fellow of Royal Society of Chemistry and Fellow of the ACS, AAPS member and he serves on the Scientific Advisory Board of several companies and professional societies and has adjunct professor appointments at several universities in the US and abroad. He received numerous awards and honors including two ACS

Heroes of Chemistry awards in 2008for the discovery of Torisel, first m-TOR inhibitor anticancer drug and 2014 for discovery of Effexor, first SNRI antidepressant drug and he was named in 2014 "Researcher and Educator of the Year" by the PA Biopharmaceutical Association & the Philadelphia Business Journal in 2014 Grand Hamdan International Award in the Field of Medical Sciences in Drug Discovery.

Drug Discovery Then and Now: The Road to Personalized Medicine

Pharma has embarked on a range of initiatives aimed at reducing attrition rate, improving productivity and exploiting new targets including transcription and translation. Increased efforts have been dedicated to identifying molecular biomarkers of disease which play an important role in increasing the accuracy and efficiency of drug discovery and development by supporting more rapid and accurate disease diagnosis, accelerating drug discovery and development and potentially reducing the size and duration of clinical drug trials. Such measures would be expected to speed up drug development and reduce drug development cost. Precise diagnostic tests have led to targeted therapies rather than the “one size fits all” approach of the past. Personalizing treatments that account for genetically mediated differences in drug responses is an exciting opportunity to improve patient outcomes and offer therapeutic and economic value. This approach will undoubtedly save lives and save money.

The presentation will cover the following themes:

- Drugs Platforms and Drug Discovery Processes that have led to FDA Approvals of Innovative Therapeutics Utilizing Traditional and Newly Expanded Disease Targets.
- SNPs affecting Disease detection, Risks and Drug Response.
- Companion Diagnostics and Targeted Therapies for Cancer
- Precision Medicine’s Impact on Pharma and Health Care, Challenges and Future Opportunities
- Academic Drug Discovery centers highlighting the Moulder Center’s Enabling Technologies, Research Capabilities and Potential opportunities for collaboration with academic and industrial institutions.

Dr.Abou-Gharbia is a Fellow of Royal Society of Chemistry and Fellow of the ACS, AAPS member and he serves on the Scientific Advisory Board of several companies and professional societies and has adjunct professor appointments at several universities in the US and abroad. He received numerous awards and honors including two ACS

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PROF. DR. TERRY L. SCHWINGHAMMER

Professor Emeritus of Clinical Pharmacy, School of Pharmacy West Virginia University, USA

Biography

Terry L. Schwinghammer is Professor Emeritus at the West Virginia University (WVU) School of Pharmacy. From 20052018-, he was Professor and Chair of the Department of Clinical Pharmacy, and from 20152018- he held the Arthur I. Jacknowitz Distinguished Chair in Clinical Pharmacy at WVU. He was previously Professor of Pharmaceutical Sciences at the University of Pittsburgh School of Pharmacy. Dr. Schwinghammer received his BS and PharmD degrees from Purdue University and completed a pharmacy residency at Indiana University Hospitals. He is a Board-Certified Pharmacotherapy Specialist and has practiced in adult inpatient and ambulatory care. Dr. Schwinghammer is a recipient of the American Pharmacists Association-APPM Distinguished Achievement Award in Clinical/Pharmacotherapeutic Practice and is a Distinguished Practitioner in the National Academies of Practice. He is a member of the Academy of Excellence in Teaching and Learning of the WVU Health Sciences Center. In addition to authoring over 100 research and other publications, he is founding editor of The Pharmacotherapy Casebook and co-editor of The Pharmacotherapy Handbook and the textbook Pharmacotherapy Principles & Practice. Dr. Schwinghammer has served the American Association of Colleges of Pharmacy (AACP) as Chair of the Pharmacy Practice Section, Chair of the Council of Faculties, and member of the Board of Directors. He is a past president of the Pennsylvania Society of Health-System Pharmacists and received the Pharmacist of the Year, Community Service, and Sister M. Gonzales Duffy Awards from the organization. He has served as Chair of the Board of Pharmacy Specialties and elected member of the Board of Regents of the American College of Clinical Pharmacy (ACCP). He is a Fellow of ACCP, the American Society of Health-System Pharmacists (ASHP), and the American Pharmacists Association (APhA) and has been elected to membership in the Rho Chi Pharmacy Honor Society and the Phi Lambda Sigma Pharmacy Leadership Society. He was named a Distinguished Alumnus of Purdue University in 2004. In 2016, he received the AACP Robert K. Chalmers Distinguished Pharmacy Educator Award.

Pharmacy Practice in the 21st Century: What Does the Future Hold?

Advanced technology has led to the recent introduction of complex new synthetic drugs, biologic agents, medical devices, and diagnostic procedures. These innovations, coupled with a shift to value-based healthcare, increased focus on wellness, and increased consumer-driven care, are dramatically changing healthcare delivery

worldwide. However, new technologies contribute to rising healthcare costs and can be associated with serious patient harm. In addition, many segments of society lack access to even the most basic healthcare services. Pharmacists are uniquely positioned to collaborate with other healthcare providers in team-based care delivery to optimize medication therapy and health outcomes. If pharmacists are to achieve their full potential in the 21st century, the Dr.Abou-Gharbia is a Fellow of Royal Society of Chemistry and Fellow of the ACS, AAPS member and he serves on the Scientific Advisory Board of several companies and professional societies and has adjunct professor appointments at several universities in the US and abroad. He received numerous awards and honors including two ACS
profession must move from practices that are focused primarily on medication dispensing to models such as comprehensive medication management (CMM), where pharmacists are held accountable for “getting the medications right” as members of interprofessional healthcare teams in acute and chronic care settings, including the patient-centered medical home (PCMH). Such practices are facilitated by advances such as health information technology, electronic health records, clinical decision support systems, artificial intelligence, telepharmacy services, antimicrobial stewardship programs, specialty pharmacy services, precision medicine, adoption of biosimilars, and wearable monitoring devices. Use of pharmacy technicians, robotics, centralized prescription filling, and e-commerce will increase as businesses seek to increase efficiency and reduce the cost of medication delivery. These changes can allow greater participation of pharmacists in direct patient care. It is imperative that the pharmacy profession take advantage of the opportunities offered by these innovations if it is to remain an integral part of the healthcare system

DR. BRIAN R. OVERHOLSER

Associate Professor, Department of Pharmacy Practice, College of Pharmacy, Purdue University, USA

Biography

Biography

Dr. Brian R. Overholser, PharmD, FCCP is an Associate Professor at the Purdue University College of Pharmacy with a laboratory located in the Personalized Medicine Institute at the Indiana University School of Medicine. This is a research rich environment at the heart of the Indiana Clinical and Translational Research Institute. Following his PharmD, Dr. Overholser completed a fellowship in Clinical Pharmacology. As a faculty member, he was the recipient of a K08 award from the National Heart, Lung, and Blood Institute at the National Institutes of Health that added a molecular and cellular electrophysiology component to his laboratory. This award along with additional funding from the National Institutes of Health, Showalter Trust, Lilly Endowment, American College of Clinical Pharmacy, and the American Heart Association has resulted in a translational research program. The goal of his research program is to identify mechanisms the pathologic regulation of voltage-gated ion channels using cellular and animal models that are translatable to clinical practice. His multidisciplinary research team has published over 35 original research papers in addition to 14 book chapters. Most recently, his laboratory has pursued the genome-wide screening of microRNA which has resulted in exciting data related toward the development of a molecular fingerprint to predict drug-induced arrhythmias. Dr. Overholser is involved in the teaching mission by Directing the Graduate Programs in Translational Sciences and Health Services, Outcomes, and Policy in the College of Pharmacy. He also coordinates the core Pharmacogenomics course in the College of Pharmacy Practice in the 21st Century: What Does the Future Hold?

Advanced technology has led to the recent introduction of complex new synthetic drugs, biologic agents, medical devices, and diagnostic procedures. These innovations, coupled with a shift to value-based healthcare, increased focus on wellness, and increased consumer-driven care, are dramatically changing healthcare delivery Pharmacy and is an instructor in several courses related to Pharmacokinetics and Pharmacokinetics in the graduate program at Purdue University and the T32 Clinical Pharmacology program at the Indiana University School of Medicine.

Overcoming the Gap between Science and Practice to Enhance the Delivery of Precision Medicine

Precision medicine applies individual differences in environments, lifestyles, and genes toward the prevention, diagnosis, and treatment of diseases. Rapid advances in science and technology have created opportunities to tailor health care delivery beyond current practice models. While advances in technology have overcome many of the early barriers to precision medicine, the traditional medical model is not conducive to the incorporation genome-wide and other large-scale omics data into practice. As technology has continued to outpace the implementation of big data into clinical practice, the gap between science and practice has widened. The overall goal of this presentation is to create awareness of how things are moving in the field of precision medicine.

The objectives of the presentation are to:

•Describe innovative medical models that deliver precision medicine and

•Discuss emerging fields that will continue to shape the practice of precision medicine

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DR. BRIAN R. OVERHOLSER

Professor of Clinical Pharmacy, Faculty of Pharmacy, Cairo University, Egypt

Biography

Dr. Nirmeen A. Sabry a Professor of Clinical Pharmacy & Pharmacy Practice, Cairo University, obtained her Doctorate degree in clinical pharmacy and pharmacy practice at King's College London, UK in 2004. Since that date, Dr. Sabry contributed in developing clinical pharmacy services in several hospitals in Egypt. Nirmeen is working as medication management consultant and clinical pharmacy trainer for several hospitals including Dar Al-Fouad, and Cleopatra group hospitals. She is a member of the Scientific Council of the clinical pharmacy fellowship program (MOH) since 2012 and member of the clinical pharmacy committee in the MOH. Dr.Sabry shared in preparing several hospitals in Egypt and Middle East for JCI accreditation.

Taking the Egyptian Hospital Pharmacies to the International Standards Level

Medication management encompasses the system and process an organization uses to provide pharmaceutical case to its patients. It is usual a multidisciplinary, coordinated effort of the different healthcare providers, applying the principles of effective process design, implementation, and improvements to the different medication steps including selection, procurement, storage, ordering, dispensing, administration and monitoring. Implementing international standards lead to improving patient's safety and quality of care. It provides a safe and efficient work environment and allows listening to patients and their families.

PROF. DR. AMR SAAD

Former Associate Minister of Health for Pharmaceutical affairs, Founder of Common Arab Guidelines for Pharmacovigilance, Founder of Egyptian Pharmaceutical Vigilance Center, Egypt

Biography

Dr Amr Saad got his Ph.D. in Epidemiology from The University of Manchester in UK in 2009. He participated in more than 220 national and international conferences. He authored and co-authored many scientific researches and more than 60 posters. He was the Associate of the Egyptian Minister of Health and founder of the Egyptian Pharmaceutical vigilance Center (EPVC) and Founder of the Egyptian Pharmaceutical Vigilance Center. He is also the Head & Member of several regulatory committees, e.g.: Supreme Egyptian consultancy committee for Egyptian MOH, Pharmacovigilance, Pharmacoeconomics, research ethics, CTD preparation, and clinical Pharmacy fellowship committees. He is also a member of the three committees responsible for establishment and updating Egyptian Lists for Essential Drugs (EDL), Life Saving Drugs (LSD) and Over the Counter medicines (OTC), and the representative of the Pharmaceutical Sector in the Crisis Management Committee in the Egyptian ministry of health.

Excellences in Pharmacovigilance

With the increasing and ever- more stringent regulations in pharmacovigilance, the regulatory authorities face greater demands for patient welfare and safety, which become prominent especially after the Thalidomide disaster. These in turn necessitate standard levels of monitoring and data analysis that ensure safe drug delivery. This can be only attained by well-structured pharmacovigilance centers backed-up with a robust legal framework and clear guidelines. Pharmacovigilance has been defined by the WHO as the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other medicine-related problem.

PROF. DR. MINA IBRAHIM TADROS

Vice Dean for Community Service & Environment Development,Professor of Pharmaceutics and Industrial Pharmacy, Faculty of Pharmacy, Cairo University, Egypt.
Former Director of Drug Manufacturing Unit, Faculty of Pharmacy, Cairo University
Biography

Dr. Mina received his Ph.D. degree from Cairo University in 2006. Since then, he participated in the delivery of many undergraduate and postgraduate courses in Cairo University, MIU, MSA and FUE. Dr. Mina is a supervisor on many Master and Ph.D. theses, a peer reviewer at 30 international journals, a co-author of several manuscripts dealing with the development of novel drug delivery systems (h-index 12) and a co-inventor of 2 patents. Dr. Mina is an external reviewer at NAQAAE on higher educational institutes and a member of CAPA scientific committees responsible for (i) Evaluation of bioavailability and bioequivalence studies, (ii) Quality of documentation of the pharmaceutical products and (iii) Registration of pharmaceutical products via CTD.
Biosimilarity and Bioequivalence of Pharmaceutical Products
The proposed biological product is considered biosimilar if it is highly similar to the reference product notwithstanding minor differences in clinically inactive components. Furthermore, several side-by-side comparative studies (structural analyses, pharmacologic activities, animal and clinical assessments) should reveal that there are no clinically meaningful differences between the reference product and the biosimilar product in terms of safety, purity, and potency.On the other hand, two pharmaceutical products (reference product and generic product) are considered bioequivalent if they are pharmaceutically equivalent or pharmaceutical alternatives and their bioavailabilities [with respect to the pharmacokinetic parameters] after administration of the same dose under the same conditions (eg. fasting and/or fed conditions) in healthy volunteers are statistically similar to a degree that their effects can be expected to be essentially the same.

DR. HEBTALLAH IBRAHIM

Director of Registration Directorate of Biological Products, Ministry of Health, Egypt
Biography

Dr. Heba got her bachelor's degree of Pharmacy from Cairo University. She is the director of registration directorate of Biological products. Dr. Heba led the evaluation team for dietary supplement registration files and was head of variation department of biological products. She was also the deputy head of biocidal registration department.
Registration of Biological products in Egypt
Dr. Heba will demonstrate the legal frameworks for registration of Biological products, together with the structure of the regulatory bodies in Egypt. Her lecture will focus on defining biologicals and biosimilars in Egypt together with the registration workflow for both products. Also , the lecture 'll be shedding light on the importance of adopting the Egyptian and international guidelines for Biological products registration

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PROF.DR. MOHIE-ALDIEN ELSAYED SHERIEF

Professor of Pharmacology, Faculty of Medicine –Benha University
Biography

Dr Mohie-Aldien is a professor pharmacology, faculty of medicine-Benha University. He also has non-academic professional experiences, medical manager in ASTRAZENECA (19922012-), Medical consultant in RAYA (20122014-) and Medical consultant OCTOBER-PHARMA-(2016-untill now). Dr. Mohie-Aldien is the author of 3 books (Cardiovascular Remodeling-Role of ACEIs-1997, Gene Therapy-between myth and reality-2007 and The future medicines-2015).
The future therapy: Between myth and reality
Gene therapy: Chromatin modification and DNA methylation and demethylation machineries are attractive therapeutic targets in cancer and other diseases, however, certain cardinal issues need to be addressed before the full potential in therapy is realized. Targeting of epigenetic modification is an interesting possibility for drug development. Different combinations of histone and DNA modification inhibitors have

synergistic effects. Understanding how some epigenetic agents might act as psychiatric drugs is one of the most exciting new directions in epigenetics. Although many questions remain open, the DNA methylation and chromatin modification machineries appear to be extremely important targets for novel therapeutics that are bound to have an impact on human disease. These classes of drugs will open new chapters in pharmacology and in our therapeutic arsenal.

Stem cell therapy: Regenerative medicine replaces or regenerates human cells, tissue or organs, to restore or establish normal function. There are several medical reality-therapies based on stem/progenitor cells e.g. hematopoietic stem cell transplantation, issue-engineered skin for severe burns, bone & cartilage repair.

PROF. DR. AZZA AGHA

Vice President for Higher Education (HE)-National Authority of Quality Assurance and Accreditation of Education (NAQAAE) in Egypt
Former member of the IC -American Accreditation Council for Pharmacy Education (ACPE) in USA, and Dean of Faculty of Pharmacy, Cairo University, Egypt

Biography

Dr Agha received her PhD from Faculty of pharmacy Cairo University in 1992. She earned “Cairo University Research Award”, and “Top 100 Educators in the World” by IBC, UK.

She works on performance appraisal and development of HE institutions through development of “Accreditation Standards of HE Institutions”, “National Academic Reference Standards (NARS) of different educational disciplines and conducting evaluation visits to HE institutions. She founded and chaired “QA centers in her Faculty and University”, and “Training Department in NAQAAE”. She founded “Continuous Education Center” and “Career Development Center” in her Faculty. She also conducted “Institutional Self Studies” and “National and International Workshops on QA”. She participated in accreditation of HE and Pre-University institutions in Egypt, and in Germany with AQAS, and with ACPE. Dr. Agha was a member in the“National Committee of Continuous Improvement and Quality Assurance Program (CIQAP)”, “Faculty and Leadership Development Program (FLDP)”, and “Higher Education Enhancement Project Fund (HEEPF)” in Ministry of Higher Education. She participated in Bonn, Alexandria and Brussels Declarations on QA in HE across Borders. She was the “Deputy of Pharmacy Sector” and “Member of Scientific Promotion Committee” in Supreme Council of Universities - Ministry of HE; “Member of Drug Control Committee” in Ministry of Health and Population; and “Member of Global Pharmacy Education Taskforce” in WHO/UNESCO/FIP.

Pharmacy Graduates for the 21st Century: Integrating the Competency-Based National Academic Reference Standards (NARS)

- **How to satisfy the labor market needs, and the importance of gap analysis to bridging the gap?**
- **What is the rational for paradigm shift to competency-based educational standards?**
- **What are the 21st century competencies? Are we prepared to be digital citizens? How to prepare global graduates for transnational mobilization?**
- **What are the roles of NARS/NAQAAE and the faculties of pharmacy in the educational program reform? Is this reform based on graduate attributes?**
- **Do the faculties of pharmacy would like and intent to have more proactive and more engaged students, and value the importance of IPE in health sector to share therapeutic decision-making?**

DR. DOUGLAS STEINKE

Senior lecturer of Pharmacoepidimiology and Pharmacy Practice, School of Pharmacy, University of Manchester, UK. (BSc, MSc, PhD, FHEA, ARPHARMS).

Biography

Dr Douglas Steinke is a Senior Lecturer in Pharmaco-epidemiology at the Manchester Pharmacy School, University of Manchester UK. He is a pharmacist (registered in Canada) and teaches in the Master of Pharmacy and postgraduate taught programmes. Prior to his present position, Dr Steinke was an Assistant Professor in Clinical Pharmacy at the University of Kentucky College of Pharmacy (USA). He is an established pharmacoepidemiology researcher and has worked in the research field in Scotland, Canada, USA and the UK. His research area is the pharmacoepidemiology and drug utilisation of medications used in chronic diseases such as type 2 diabetes, chronic cardiovascular disease and respiratory disease.

Integrated learning and Inter-professional education in the UK MPharm programme: barriers and facilitators

The presentation will give the experience gained from the Manchester Pharmacy School on the integrated approach to Pharmacy Education showing how courses spiral in learning from year to year. Also, the approach of inter-professional education in the MPharm programme. Examples will be given to show how mid-wifery, medical and optometry students learn with pharmacy students on pharmacotherapy issues through case studies. Lessons learned will be given on the strengths and barriers to teaching in the new MPharm curriculum.

DR. KATHRYN DAVISON

MPharm Course Director, Principle Lecturer of Pharmacy practice & clinical therapeutics, Pharmacy Team Leader, School of Pharmacy, University of Sunderland, UK

Biography

Dr. Kathryn Davison is a Principal Lecturer and Team Leader of the Pharmacy Practice and Clinical Therapeutics team in the School of Pharmacy and Pharmaceutical Sciences at the University of Sunderland. Dr. Davison began working at the University in 2011 and since then has led a clinical module on the MPharm course, developed a new Pre-registration Training programme, worked as MPharm Programme Leader for a 3 year tenure and holds an associate post with the General Pharmaceutical Council. She was appointed to the role of Team Leader in 2017 managing a team of over 20 staff. Dr. Davison's background is in the field of community pharmacy. She managed a busy pharmacy in Sunderland for 12 years prior to her move into academia. Dr Davison clinical pharmacy and pharmacy practice across the MPharm and OSPAP Programmes with most of her teaching being focused at the higher levels helping to prepare students for their pre-registration year. Dr. Davison completed an MSc in Clinical Pharmacy in 2014 having secured a £10,000 funding grant from the National Pharmaceutical Association to conduct research into experiential learning in the undergraduate pharmacy course.

Since then she has furthered her research in this area and completed research into pre-registration tutor training. Dr. Davison secured funding from Health Education England in 2016 to undertake a regional project in this area. Alongside other members of the pharmacy practice team, Dr. Davison is undertaking research funded by Health Education England into the effectiveness of the Prescribing Safety Assessment as a measure of performance in MPharm students and graduates. She is also currently working with colleagues on a funded project dealing with care of bariatric patients evaluating the patient reported impact of the pharmacist on pre-surgical evaluation. Using immersive simulation and standardised patients within inter-professional learning events in pharmacy education.

Didactic teaching and learning methods provide fundamental knowledge, but do not develop the clinical skills or context required for application of knowledge to complex, patient focused scenarios. At the University of Sunderland simulated learning sessions have been successfully implemented into pharmacy teaching to promote the development of clinical skills within a safe yet realistic environment. Recent investment has provided the creation of purpose built mock wards and an immersive simulation suite, allowing replication of the clinical environment and the community setting of a patient's home respectively.

In order to evaluate the perceptions of pharmacy students towards interprofessional simulated learning as a tool for developing clinical skills and their reflections on the inclusion of real patient, a series of simulated learning sessions were developed and delivered to pharmacy students and other interprofessional student groups. Each session aimed to promote interprofessional working and encourage interaction with patients. Feedback from patients and peers was then provided to each student based on their performance within the sessions. Quantitative and qualitative evaluation data was collated to assess the effectiveness of the simulated sessions and gauge reactions to performance feedback.

The use of patients within the simulations encouraged students to change their behaviours based on the feedback they received from patients. Students viewed patients' feedback positively and constructively.The use of immersive simulation and patients within interprofessional learning events can enhance engagement, knowledge retention and development of clinical skills within an undergraduate pharmacy programme.

PROF. DR. RAMY KARAM

Professor and Chair-Department of Microbiology and Immnunology-Faculty of Pharmacy, Cairo University

Biography

Prof. Dr. Ramy Karam Aziz is currently the chair of the Department of Microbiology and Immunology at Faculty of Pharmacy, Cairo University. He earned his PhD in Microbiology and Immunology from the University of Tennessee, Health Science Center in 2005, after which he specialized in microbial & bacteriophage genomics and bioinformatics during his postdoctoral training at The University of Chicago and San Diego State University. Later he conducted research at the University of California, San Diego (20112013-). His current research interests are in microbial and viral genomics and metagenomics; microbiome research; drug-microbiome interactions; and microbial systems biology. His publications include a book, seven book sections, and 70 peer-reviewed articles. He was awarded the State Incentive Award in 2012) and most recently, received an Arab American Frontiers Fellowship (August 2018), and a JESOR grant to found the Egyptian Center for Microbiome and Genome Research at Cairo University (September 2018).

The Wonders of Genomics and Metagenomics

DNA sequencing is transforming biology in an unprecedented way and at an extraordinary speed. A new biology is being shaped by genome research and by the emergence of metagenomic technologies. Huge amounts of data are generated that require powerful computational analysis tools, which are the subject of bioinformatics. Microbiology has especially benefited from genomics and metagenomics in several ways. Among the applications and advances are tracking and preventing epidemics, fighting antimicrobial resistance, discovering the impact of the human microbiome on different diseases, understanding and predicting drug-microbiome interactions, and building computational models of microbial cells and communities.

DR. AHMED FAHEEM

Senior Lecturer of Pharmaceutics, School of Pharmacy, Sunderland University, UK

Biography

Senior Lecturer in Pharmaceutics. Dr. Faheem obtained PhD in Drug Delivery and Targeting from UCL School of Pharmacy in London in 2006. Sine then, he undertook postdoctoral research positions investigating drug delivery systems for pulmonary delivery of anticancer medicines at Strathclyde Institute of Pharmacy and Biomedical Sciences in Glasgow, and for controlled delivery of HIV microbicides at Queen's University Belfast. In 2009, he played a key role in establishing a new School of Pharmacy and Pharmaceutical Sciences at Ulster University and became the Course Director for MSc in Pharmaceutical Sciences from 2010 till 2015. Dr. Faheem reasearch interests focus on the area of nanomedicine and pharmaceutical nanotechnology including the development of biodegradable nanoparticles via different formulation techniques like a novel microfluidic system for delivery and targeting of biotherapeutics with anticancer and antidiabetic activities such as peptides, proteins, SiRNA and DNA plasmids. He also developed a recent interest in the area of 3D tablet printing for personalised medicine, established collaborative links with a number of national and international research groups, and his collaboration with Bradford Institute for Cancer Therapeutics has led to a patent application. He has taken a leading role in developing international relations with academic partners for the University of Sunderland. Dr Faheem is a Fellow of The Higher Education Academy in UK and a member of the Academic Pharmacy Group at the Royal Pharmaceutical Society of Great Britain. Also, he is serving as an Associate Editor for the Journal of Analytical and Pharmaceutical Sciences and as a reviewer for many international journals in the field including the International Journal of Pharmaceutics, Journal of Controlled Release and Pharmaceutical Research Journal.

Printable Customized Tablets: Is it the next big thing in personalized medicine?

Imagine a future where patients with multiple chronic conditions no longer have to take numerous drugs several times a day – instead they can take one tablet containing all the required medications, once-daily, thanks to 3D printing.

Known as additive manufacturing, 3D printing starts with a computer-aided design of a digital model of the product. The design is then sliced into thousands of horizontal layers that will form the digital file for feeding into a 3D printer. It will then use different materials to print the product layer by layer, transforming two-dimensional layers into a 3D product. Although the technology was developed in the 1980s, it is only in the last decade or so that 3D printing has found widespread industrial applications, from the production of automotive parts to machine tools. In the healthcare arena, the medical device industry is amongst the first to utilise 3D printing, producing hearing aids, dental implants and prostheses. The pharmaceutical industry is a laggard but is now waking up to the potential that 3D printing has to offer.

The ability of 3D printing to produce medications to exact specifications tailored to the needs of individual patients has led some observers to predict the advent of more precision and personalised medicines. The technology allows tablets to be precisely printed in shapes, sizes and textures which are difficult to produce using traditional production techniques. It can print tablets which aid swallowing, have different release rates and possess taste and appearances acceptable to children, thus improving adherence.

Another advantage is that tablets can be printed to contain several active ingredients, with the dosage of each medicine personalised to the patient's age, gender, race, weight, genetic makeup and biochemical profiles. Individualised dosing may reduce adverse events, especially for medicines with narrow therapeutic index. In orphan diseases, it will be more cost-effective to print small quantities of medicines as required rather than mass-producing an entire batch with limited shelf life.

In his talk, Dr Faheem will try to answer the question that begs itself: could we see a future where, following a GP appointment, patients' encrypted prescriptions are sent online to their local pharmacy, where a pharmacist takes their physical measurements, performs a finger-prick blood test and inputs the data online on the 3D printing medicines portal, then in a few minutes, the design file downloads to the pharmacy's 3D printer, which prints out the personalised doses of several medicines as a polypill to be taken once daily.

PROF. DR. HAMDY ABDEL AZIM

Professor of Clinical Oncology, President of Cairo Oncology Center, Chairman of Kasr Al-Ainy School of Oncology, Faculty of Medicine, Cairo University, Egypt

Biography

Prof. Dr. Abdel Azim is the chairman of Kasr Al-Ainy School of Oncology and official Cancer education organization, Department of Oncology, Faculty of Medicine, Cairo University. He is the President of Africa Middle East Cancer Research Inter group and a distinguished Referee for elite journals including the Annals of Oncology Journal, The Breast Journal (TBJ), BMC Cancer and Advances in Cancer Research & Treatment. Dr. Abdel Azim was the first to represent the Middle East countries on the ASCO international committee, for a period of 5 years (May 1997-May 2002). He authored and co-authored over 80 publications and he was the chief editor of two educational books. He was also awarded the Scientist of the Year from the International Biographical Centre, Cambridge, UK (2002) and the recognition award for significant contribution to the Oncology field in the Middle East from UAE (Dubai -2013). He is a member of numerous societies, including the ASCO, ASH, ESMO, ASTRO and the European Blood and Marrow Transplantation Society.

Innovations in cancer treatment with emphasis on liver cancer

The presentation will demonstrate the different updated protocols used in cancer therapy and the new trends in treating hepatocellular carcinoma which is among the most prevalent types of cancer in the community.

PROF. DR. WAHID DOSS

Professor of Gastroenterology and Hepatology, Cairo University, Egypt, National Institute for Research on Endemic Diseases and Liver, Head of the national committee for treatment of hepatitis-C

Biography

Prof. Dr. Doss is the head of the national committee for combating viral liver infections. Dr. Doss is one of the top distinguished leaders who took responsibility for management of viral Hepatitis C in the country. Dr. Doss was the dean of the national liver institute for 9 years from 2006 till 2015, and a WHO consultant who elegantly participated in developing therapeutic protocols for management of Hepatitis C worldwide. Dr. Doss authored and Co-authored several international publications concerned with viral Liver infections and therapy. He was also a principal member of the medical team who performed the first liver transplant surgery in Egypt and a founder member of the gastro-endoscopy unit at Cairo University. He is the vice president of the Egyptian liver patients association, a charity organization that presents medical and psychological care for Hepatitis patients.

Innovation in treatment of Hepatitis-C in Egypt

Over the past few years, countries made a commitment to eliminate viral hepatitis as a public health threat by 2030. Unfortunately, Egypt has one of the highest global burdens of hepatitis C virus (HCV) infections; it is estimated that prevalence of HCV is around 4.5% to 6.7%. The root causes, as well as catalysts of transmission of HCV and hepatitis B (HBV) in Egypt, are strongly associated with healthcare-related malpractices. A comprehensive Infection Prevention and Control program in the Egyptian Ministry of Health and Population (MoHP) was successfully launched in 2001 and has succeeded in improving adherence to infection prevention and control practices and developing the national infection control guidelines. This was followed by the establishment of the Egyptian National Committee for Control of Viral Hepatitis (NCCVH) in 2006, which started to treat patients using interferon regimen. By October 2014, the NCCVH introduced the first approved highly effective direct antiviral agent (DAAs) for nationwide treatment of HCV infection at 1% of its international price at that time; this medication has been shown to cure over 90% of those mainly receiving the locally produced effective generic medicines. The national financing scheme covered the cost of treatment for all cases and supported the enrolment of more patients.

Egypt has an ambitious goal of eliminating hepatitis by 2023. The country is planning to screen 45 million citizens in one year starting 1 October 2018, respecting the WHO core testing principles of providing consent, confidentiality, and counselling, correct results and connection to treatment for all people who will be discovered positive. The aim is to treat all identified cases from the screening. Meanwhile, international partners such as the World Health Organization (WHO), USAID, Centers for Disease Control and Prevention (CDC) and the World Bank are working closely with the Government of Egypt to technically and financially support the optimistic goal of eliminating HCV. Building national capacities in managing huge data influx is very crucial to achieve such a target.

PROF. DR. HOSSAM MOWAFI

Professor of Critical Care and Internal Medicine, Cairo University, Former dean, Faculty of Medicine, MUST University, Advisor to the chancellor, MUST University, Founder of Hossam Mowafi critical care Unit, Cairo University hospitals.

Biography

Prof. Dr. Hossam Mowafy, professor and former head of Critical Care Unit, Faculty of Medicine, Cairo University. His contributions in the medical field made him a pioneer in adult internal medicine in Egypt. Besides his position at Cairo University, Prof. Mowafi was the former dean of Faculty of Medicine, MUST University. On top of that, he spent more than 2 years internship in Harvard University, USA. Prof. Mowafy has published more than 100 research papers with an impacted applied practice in medicine. Believing in the noble message of medicine, Prof. Mowafi is keen on spreading this message through charity work and medical practice not seeking profits. He is a role model for other physicians and younger generations through his inspirational lectures, and TEDEX talks. He takes responsibility for raising medical awareness in the community to manage and avoid common health issues in Egypt by presenting simple tips in different medical pressers. Prof. Mowafi lectures in multiple Universities including MUST University.

Hepato-renal syndrome or Hepatic and Renal

Hepatorenal syndrome (HRS) is a unique type of acute kidney injury (AKI) in patients with end stage liver disease. HRS is associated with poor prognosis and represents the end-stage of a sequence of reductions in renal perfusion induced by progressively severe hepatic injury. It is primarily characterized by unexplainable progressive increase in serum creatinine in patients with advanced liver disease. Liver transplantation (LT) remains the treatment of choice for HRS but is limited by organ shortage. The HRS is an important risk factor since it increases the waiting list mortality and incidence of complications after LT and renal function before LT is a predictor of survival. Vasoconstrictive agents and volume expansion constitute the main part of pharmacological treatment, providing a bridge to LT. Hemodialysis, renal replacement therapies and artificial liver support systems may provide short-term benefit for patients not responding to medical therapy whilst awaiting LT. The goal of treatment in HRS should be early diagnosis, effective and quick treatment and, most important of all, to take preventive measures. Despite, the new developments on treatment modalities and advances in understanding the pathophysiology of HRS, patient prognosis still remains dismal. Clinicians need to be aware of the pathophysiology and management principles of HRS to provide quality care for patients with multi-organ failure.

PROF. DR. M. ISMAIL HAMED

Distinguished Professor of Pharmacology and Clinical Pharmacy, Head of Clinical Pharmacy Department, College of Pharmaceutical Sciences and Drug Manufacturing, the Academic Consultant of Board of Trustees, MUST University

Biography

Prof. Dr. Ismail is the Distinguished Professor of Pharmacology and Clinical Pharmacy at colleges of pharmacy and medicine since 1998. Having a wide experience in the educational, administrative and clinical pharmacy sectors, Prof. Dr. Ismail was the former dean of pharmacy college, 6th October University from 19992001-. He was the vice president for graduate studies and research and the president and chairman of the scientific committees, 6th October University from 2003 till 2006. Is a supervisor at clinical Pharmacy department, college of pharmacy, Ain Shams University from 2001 till 2006. Academically, Dr. Ismail authored and co-authored over 100 national and international publications. He is a distinguished editorial board member of 3 international journals and a reviewer for 10 journals. He was awarded twice with the distinction award of king Saud University in 1980, and 1984. He also got the gold medal for professional achievement in pharmacy in 1999 and won the prize of the international symposium on travel medicine, Saudi Arabia in 2001. Dr. Ismail has a special interest in the therapeutic and verification protocols of different venoms for which he is a member of multiple respectable committees including the review group to the chemical weapon convention at USA since 1992 till present, and a member of the WHO expert group on Envenomation and their treatment protocols. He is also a member of over 13 scientific committees including the scientific committee for the Arab pharmacopoeia, national committee for pharmacology, toxicology and development of higher education. He is the developer and founder of the scientific team offering Pharm D courses presented by MUST University. Dr. Ismail is currently the head of Clinical pharmacy department, College of Pharmaceutical sciences and the academic consultant for the Trustees Board, MUST University.

Preparation of a novel antivenom against Atractaspis and Walterinnesia venoms

The two deadly snakes, Walterinnesia aegyptia (black desert cobra) and Atractaspis microlepidota (mole viper) share a common habitat in the central, eastern and western provinces of Saudi Arabia. Bites by either snake were characterized by rapid death, sometimes before reaching any medical facility. Confusing reports of "a black snake bite" are frequently found. The NAVPC had succeeded in preparing a highly effective antivenom against W. aegyptia venom which is now available in the market, but no antivenom against Atractaspis venom is found worldwide. This is probably because of the low molecular weight of sarafotoxins in the venom and hence their poor antigenic properties. At the NAVPC, sarafotoxins were separated by sequential gel filtration of A. microlepidota venom, while toxin T(III) of W. aegyptia venom obtained by cation exchange chromatography and gel filtration. Conjugation of the two toxins was carried out using glutaraldehyde in a two-step procedure followed by exhaustive dialysis. The conjugate was utilized to hyperimmunize 3-years old horses for 10 months, applying a low-dosage protocol and immunostimulants; the crude venoms of both snakes being added during the last 2 months. The F(ab')2 fraction of the antivenom was obtained by pH-guided salt precipitation, enzyme digestion and tangential desalting and filtration. The bivalent antivenom obtained protected mice and rats against the lethal effects of both venoms and rescued the rats challenged with lethal doses of the venoms in recovery experiments. It also neutralized the haemorrhagic, necrotizing and the cardiotoxic effects of A. microlepidota venom and the neuromuscular blocking effect of W. aegyptia venom. The antivenom offers a good rescue potential to those who are bitten by "a black snake" in Saudi Arabia.

DR. SOHEIR ABDEL-HAMID

Head of Health Insurance Council, Ministry of Health, Egypt
Biography

Dr. Soheir Abdel Hamid has a long experience in therapeutic affairs and hospitals management. She was the former manager of the Nile hospital and Nasr City hospital. Dr. Abdel Hamid worked as the manager of general training unit at health insurance council. She led several projects as a project manager of health insurance projects in different governorates including Port Said and she was the manager of health insurance, Cairo branch. Currently Dr. Soheir is the undersecretary health minister, taking responsibility for health insurance system reforms.
Health Insurance Services in EGYPT
Dr. Soheir will demonstrate the different health insurance services in the community, covering the preventive protocols, diagnostic services presented all through the governorates. The presentation also focuses on the therapeutic services and the advanced therapeutic services presented by the health insurance council concerning prevalent health burdens as hepatitis, diabetes and renal failure. Additionally, the presentation demonstrates the available substitutive services presented by the council for affected patients.

DR. GIHAN HAMDY ELSISI

Founder and Head of Pharmacoeconomic Unit, CAPA, Ministry of Health, Egypt
Lecturer of Pharmacoeconomics and research outcomes, international and national wide. Secretary/ Treasurer, ISPOR Egypt
Biography

Gihan Hamdy Elsisi is the Managing director, HTA Office, Middle East and North Africa. She was the founder and former Head of Pharmaco-economic Unit at the Central Administration for Pharmaceutical Affairs (CAPA), Egyptian Ministry of Health and former lecturer at Faculty of Pharmacy, German University in Cairo. Elsisi received PhD in Pharmaco-economics/pharmaceutical sciences from Ain Shams University and had got a certificate on Health Economics and Outcomes Research at the University of Washington. Through the CAPA, Elsisi was able to successfully incorporate Pharmaco-economics and Outcomes Research into the coverage decisions of drugs. She is the principal author of both Health Care Systems Roadmap for Pharmaceutical pricing and reimbursement and the Pharmaco-economic Guidelines for Egypt, International Society for Pharmaco-economics and Outcomes Research (ISPOR). In 2011 and 2012 she received ISPOR awards at the ISPOR 14th and 15th Annual European Congresses in Madrid and Berlin. Elsisi represented Egypt in the First and Second Middle East Africa Pricing & Reimbursement Future Trends Workshop in Muscat 2012 and in Dubai 2013. She has several publications and also contributed to a number of clinical research and surveys. She is the treasurer of ISPOR Egypt Chapter. She is a special guest speaker at many international companies for achieving market access and maximizing commercial performance in Turkey & Middle East.
The value of innovative treatments: Are they Cost-Effective?

Following are questions that we ask with in our health care systems: Can the health system support the additional cost for each life saved if the new drug is both more costly and more effective than previous therapies? How much money must be saved in order to make it cost-effective to accept a reduction in efficacy over existing strategies?
Cost-effectiveness analyses have assumed greater importance through the development of more sophisticated analytic techniques because of the increasing prominence of these analyses in worldwide drug registration, formulary decision making, therapeutic guideline determination, and individual patient decisions. Health care reform has required methods to evaluate economic and societal value of goods and services and therefore, pharmacoeconomics is used to evaluate value for money expended on health care technologies.

PROF. DR. MAHMOUD DIAA ELMAHDAWY

President, ISPOR Egypt & Head of ISPOR Africa Network, Market Access Director (AMAC)-(Asia, Middle East, Africa, Pacific countries

Biography

Dr. Elmahdawy, is a PharmD graduate from Drake University (USA), College of Pharmacy, May 2001. He has worked as a clinical pharmacist at a major hospital in Des Moines, Iowa for 4 years, with emphasize on CSICU and oncology settings. In Egypt he worked in academia as a supervisor and training director of clinical pharmacy Department at MIU in addition to lecturing on clinical and hospital pharmacy. Dr. Elmahdawy accepted a challenge and moved to the Egyptian Drug Authority (EDA) as general manager of Hospital Pharmacy Administration in 2010. His department oversees procurement, Clinical Pharmacy and Pharmacoeconomics, responsible for clinical pharmacy fellowship program, and supervises clinical pharmacy implementation across the government hospitals in Egypt. He held the president of International Society of Pharmacoeconomics and Outcomes Research (ISPOR) Egypt's chapter, established in 2011. He has also been elected as President Elect of ISPOR African Network and is a proud recipient of the ISPOR travel scholarship award. Dr. Elmahdawy has lectured and moderated several Pharmacoeconomics conferences and workshops, participated in several research activities relating to Pharmacoeconomics and Outcomes Research. As part of a team, a "Health Economics" postgraduate diploma was launched for the first time in the Middle East where Dr. Elmahdawy was amongst the first graduating wave. Proudly, ISPOR Egypt's chapter is amongst active chapters with dynamic activities and helping to further spread Pharmacoecomics awareness across the region. Currently, Dr. Elmahdawy is regional Patient Access Director for region APMA (Asia, Pacific, Middle East, Africa) with Novartis Pharmaceuticals and is championing RWE across that region.
Pharmacoeconomics and Resource Allocation
Health care spending is increasing exponentially, and heath care resources are limited. Pharmacoeconomics aims to improve utilization of current available resources and optimize Health care spending. Health technology assessment and outcomes research are also highly relevant for emerging markets. Presentation will focus on key terminology as well as key types of Pharmaco-economics analysis and their practices applications and role of organizations like ISPOR in enhancing science of HEOR globally

PROF. DR. HANAN REFAI

Professor of Pharmaceutics and Head of Department, College of Pharmaceutical Sciences and Drug Manufacturing, MUST, Egypt

Biography

Prof. Dr. Hanan Refai is currently the chair of Pharmaceutics Department, Misr University for Science and Technology. She received her Bachelor's degree from Faculty of Pharmacy, Cairo University in 1994. She obtained her Master degree from Martin-Luther University, Halle-Wittenberg, Germany, 1998 and earned her Ph.D. degree from Carolo-Wilhelmina University, Braunschweig, Germany in 2001. She contributed in the establishment of the pharmaceutics department at several private universities in Egypt. Dr. Hanan is a supervisor on many Master and Ph.D. theses and a peer reviewer at several international journals. Her current research area is the application of nanotechnology in the preparation of different pharmaceutical drug delivery systems that improve the bioavailability of drugs and prolong their effect in the human body.

Superparamagnetic Iron-Oxide Nanoparticles for Targeted Drug Delivery

Nanoparticles are being developed as drug carriers yielding improved treatment efficacy and reduction of unwanted side effects. Among the broad spectrum of nanoscale materials being investigated for biomedical use, magnetic nanoparticles have gained significant attention due to their intrinsic magnetic properties, which enable tracking and targeting of drugs to their site of action. This class of nanoparticles includes superparamagnetic iron oxide nanoparticles (SPIONs). SPIONs-based drug delivery systems rely on external magnetic field guidance to reach their target tissue. Magnetic vehicles reduce the clearance of drugs and increase their blood circulation time. They also increase drug internalization efficiency within target cells and minimize nonspecific cellular interactions, thus reducing the total required dose and associated side effects. In her presentation Dr. Hanan will also shed the light on her recent research on using SPION for magnetic brain targeting of clonazepam.

WORKSHOPS

WORKSHOP I

International Pharmaceutical Federation (FIP)

"The Pharmacy Practices Revolution over the World"

DR. WAEL ALI

Executive committee member of FIP (International Pharmaceutical Federation), Health and medicine information section (HAMIS) Representative for Middle East and Africa.
Biography

Wael Ali, BPharm, MSc, MBA, Wael Ali graduated with BPharm from Egypt. He has worked as a community pharmacist, social and administrative pharmacy in Egypt, Gulf and USA. Then CEO of pharmaceutical company in USA. Wael has co-authored many researches in clinical pharmacy, community pharmacy and public health. Many peer-reviewed, evaluate researches and articles. Wael has more than 18 years' experience in the Pharmacy profession; including, community pharmacy, Hospital pharmacy, military and emergency pharmacy, social and administrative Pharmacy and clinical pharmacy. Wael is a dynamic international professional with extensive experience in pharmacy and health supply chains in the development context. Through his career he has engaged as a pharmacist in clinical, business, academia, development and executive roles with a drive for results. By applying systematic approaches to business and development projects. Wael has a demonstrated ability to achieve results in a timely fashion on sustainable platforms, which he entered the private sector managing pharmaceutical company for ten years.

Wael was the Executive Manager of "The People that Deliver Initiative", a global project seeking to improve professionalization of the workforce engaged in health supply chains. In 2016 Wael has taken on the role of Executive committee member of FIP, Health and medicine information section representative for Middle East and Africa. Wael has many researches in public health and medicine information. He got award in The FIP Congress 2015 held in Dusseldorf, Germany for his research in clinical pharmacy (in Egypt; wave of Painkiller addiction) and many researches in hepatitis C in Egypt. Wael has been an active member of the pharmacy profession serving on local and national pharmacy associations and regulatory boards in leadership positions as well as aiding on committees to further advance the practice of pharmacy through patient focused care. Wael is the Executive committee member of the Health and Medicines Information Section of FIP.

The workshop will discuss:

- **In 2018 what are the new pharmacy practices and job opportunities for the pharmacists and not in Egypt.**
- **In Egypt: what are the pharmacy practices deformities and how we can deal with them.**
- **New opportunities to the Egyptian pharmacists**
- **New channels for the pharmacy students over the world.**
- **Pharmacy students' programmer's opportunities in USA and Europe.**

WORKSHOP II

Ministry of Health (MOH)

Modern Hospital Pharmacy Specialties: More Integration into Health Care Systems

Hospital Pharmacy Administration as a regulatory authority within Central Administration for Pharmaceutical Affairs (CAPA) standardizes and supervises the Pharmaceutical Care services in order to promote rational drug use, highlighting pharmacist's role in health care systems within MOHP. "Medication Error Reduction and Preventing system" and "Antimicrobial Stewardship Program" are our priority projects throughout the forthcoming few years to highlight pharmacists` cohesion with other health care professionals providing the best pharmaceutical care services coping with the international standards. We are pleased to introduce pioneer hospital pharmacy models in the form of some fruitful examples.

The workshop will discuss:

- **Types of medication errors**
- **The role played by hospital pharmacist in management of medication errors through "Drug and Therapeutic Committee".**

This interactive workshop will include a role play of an ideal Drug and Therapeutic committee discussing medication errors. The attendees will be provided with pre-identified and analysed medications errors excel and analysis chart in order to find the possible causes and recommendations for the analysed medication errors.

WORKSHOP III

World Health Organization (WHO)

Innovation and Changing of Cancer Future

DR. ABDALLA ABO TALLEB

World Health Organization expert. Consultant on health economics, Egyptian Ministry of Health
Biography

Abdalla Abo Talleb is one of the most profound experts in healthcare policy and regulations in the Middle East. His expertise extends from HTA & Reimbursement policies to regulatory and supply chain strategies in the public sector. He has been involved in the fields of health economics, outcomes research, and reimbursement policy within the healthcare industry for 15 years, with experience across the pharmaceutical, biologicals and vaccines. And now works for WHO as a project manager at health care reforming area. Abdalla Abotaleb graduated in faculty of pharmacy then obtained a post-graduate in health economics followed by a PhD in Health Economics & Policy form York University. He also has a degree in Project management professional (PMP), Pharm. D certificate and a Master of business administration (MBA). He, in addition to being a committee member and project manager in a number of national projects in many countries including Germany, United Kingdom, Egypt, Algeria, Sudan, Russia and Poland, He is a very active researcher with tens of publication across different well recognized organizing including ISPOR, ESMO, ASCO, ECCO, iHEA. HTAI, and EAHE. He has been a true contributor to several public and industrial projects in Egypt, his homeland.He committedly changed the landscape of the healthcare policy there .A few examples to mention are his contributions to the establishment of the NORCB (national organization for control and research of biologics), Egyptian Biosimilars guidelines the cancer and MS registry. Establishing stroke units, hospital based HTA and Health economic unit at ministry of health in Egypt's different sectors. Multiple engagement efforts are well recognized in his research through introducing concepts of stakeholder engagement. He also does that by being an active member of many research organizations internationally and locally like the ISPOR and its local chapter.

DR. KHALED ABDEL-AZIZ

Dr. Khaled Abdel-Aziz is a clinical oncologist, experienced in recent therapeutics and novel radiation techniques for the treatment of cancer patients. His main area of expertise is hepato-biliary, brain and head and neck cancers. His has also a long experience in medical software, being a medical consultant for Vertex IT company. Medical software consultant, Vertex IT (2011- Present). • Radiotherapy specialist, Misr Oncology Center (2011- Present). • Program coordinator of the ASU-YOUTH (Ain Shams University – Young Oncologists' Union) (2012 - Present). • C.A.I.R.O (Critical Appraisal Initiative for Research in Oncology) Journal club coordinator, Egypt, (February 2014- Present). • Lecturer of clinical oncology and nuclear medicine, Faculty of medicine, Ain Shams University, Cairo, Egypt (July 2015 – Present) • Clinical Oncology consultant, Avicenna Oncology Center (July 2015 – Present) • Clinical Oncology consultant, Yassin Abdelghaffar Liver diseases medical center (April 2016 – Present) • Clinical Oncology consultant, International Medical Center (August 2016 – Present) • Head of Computational medicine department, Faculty of medicine, Ain Shams University Research Institute (MASRI), (June 2016 – Present). Innovation and Changing of Cancer Future

Thanks to earlier detection, improved screening and innovative treatments, certain types of cancer are becoming more manageable than before. While the paradigm is shifting, cancer still remains one of the leading causes of death worldwide. Cancer is second most common cause of death in United States, surpassed only by heart disease. In 2016 alone, more than 1.6 million new cases of cancer were expected to be diagnosed and nearly 600,000 Americans were expected to die of cancer. In addition to the substantial clinical burden of cancer on patients, cancer also imposes a significant economic burden. Cancer diagnosis also creates significant physical and emotional burdens arising from both the disease, as well as treatments that limit activity and disrupt their daily lives.

Cancer, in its many forms, has long been one of the most devastating and confounding health concerns worldwide. Characterized by the uncontrolled growth and spread of abnormal cells, cancers, if left unchecked, can lead to malfunction of various health systems and, eventually, death. Cancer can originate anywhere in the body and can disseminate throughout other areas of the body.

Medical professionals are now reviewing their approach to cancer care — which includes diagnostics and treatment innovation. A new approach ultimately needs to put the patient at the heart of care. Rapid technological advances and an emerging understanding of the underlying drivers of disease are changing the face of cancer. We now know that cancer is not a singular condition but, rather, a collection of diseases, each with unique characteristics and features. Researchers are learning more about what may cause various forms of cancer. Some cancers are known to be caused by environmental factors, including sun exposure and tobacco use, and some cancers are known to be related to infectious diseases. In many cases, steps can be taken to prevent these forms of cancer. However, many cancers seem to occur at random, without a specific environmental cause.

Researchers have made great strides in recent years in identifying the genetic mutations and related factors that can drive the seemingly random formation and proliferation of abnormal cells in cancer, as well as genetic markers that may identify patients at a greater risk of developing cancer. These learnings not only enable better screening and diagnoses but also drive the development of a new era of cancer treatments.

POSTER ABSTRACTS

DAY 1

Topic	Code
Pharmacology and Toxicology	PC
Analytical and Physical Chemistry	AC
Pharmacognosy and Herbal Medicine	PG
Medicinal Chemistry and Drug Design	MC
Biochemistry and Biotechnology	BC

PHARMACOLOGY AND TOXICOLOGY

PC-01

Combined Neurotoxic Effects of Nandrolone Decanoate and Cannabis Extract in the Hippocampus of Adolescent Rats

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Polydrug use among adolescence is a very frequent phenomenon and has increased in the last few years. In particular, most cannabis consumers combine it with nandrolone, thus studying the consequences of these combinations in adolescent subjects seems important, since a potentiation of their effects may increase their neurotoxicity. The present study was designed to study the neurotoxic effects of nandrolone and cannabis, alone and in combination, in adolescent male rats. Nandrolone decanoate (15 mg/kg, s.c.) and cannabis extract (20 mg/kg, I.p.) were given alone or in combination to male rats once daily for one month. Rats were challenged in the open field, elevated plus maze and Morris water maze. Abuse of nandrolone induced behavioral and motor abnormalities, increased oxidative stress (significantly increased malondialdehyde and nitric oxide level and reduced glutathione content), elevated brain pro-inflammatory cytokines (tumor necrosis factor alpha and interleukin 1 beta) as well as deleteriously altered brain histopathology and marked increase in brain caspase–3, caspase-8 gene expression and cytochrome c activity. In contrast, cannabis only increased brain proinflammatory cytokines level, caspase-3 and caspase-9 gene expression and cytochrome c activity. However, abuse of both nandrolone and cannabis conferred more neurotoxic effects in most of the measured parameters. In conclusion, abuse of nandrolone and cannabis, alone and in combination, induced neurotoxicity which was proved behaviorally, biochemically and histopathologically

PC-02

High-Fat Diet Induced Alteration in Lipid Enzymes and Inflammation in Cardiac and Brain Tissues: Assessment of the Effects of Atorvastatin-Loaded Nanoparticles

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In previous studies, the effect of different sizes of atorvastatin calcium-loaded nanoparticles (AC-NPs) on the pharmacokinetics (PK) and the pharmacodynamics (PD) profiles of AC following oral administration to adult male albino rats were described. This study was designed for investigation of the effect of oral administration of atorvastatin-loaded nanoparticles (AC-NPs) (<100 nm) to hypercholesterolemic adult male rats on the enzymes responsible for lipid metabolism in hepatic tissue and inflammation induced in cardiac and brain tissues.Adult male rats were divided into six-treatment groups. Except for the animals of the negative control (group 1), groups (26-) were fed with high fat diet (HFD) until the end of the study. Following six weeks of HFD, groups 36- received the assigned treatment

for two consecutive weeks. HFD-fed control group faced a significant elevation in HMG-Co A along with significant reduction in LDL-receptor and cholesterol 7α-hydroxylase enzyme in hepatic tissues relative to control group. In addition, HFD-fed showed a significant increase in hepatic oxidative stress markers, cardiac homocysteine level and pro-inflammatory cytokines IL-1 and IL-6 levels in brain tissues. Groups treated with Lipitor and AC-NPs augmented both mRNA LDL-receptor and mRNA 7α-hydroxylase expressions in hepatic tissues along with a significant depletion in mRNA HMG-COA reductase expression relative to HFD-fed group. The cytotoxic symptoms recorded in cardiac and brain tissues of HFD-fed group were more ameliorated by administration of AC-NPs treatments than Lipitor. Encapsulation of AC in nanoparticles formulations were more effective in ameliorating the toxic impacts induced by dyslipidemia when compared to Lipitor.

PC-03

Involvement of the Serotoninergic System and Neuroplasticity in the Antidepressant Effect of Curcumin in Ovariectomized Rats: Comparison with Oestradiol and Fluoxetine

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Antidepressant drugs are associated with many challenges due to their adverse impacts. Seeking alternatives through medicinal plants could have great merit in overcoming these deleterious effects. This study was designed to investigate the potential mechanism of curcumin (CUR) in modifying the depression-like behaviour in ovariectomized (OVX) rats, inference with fluoxetine (FLX) and estradiol (E2), the treatments of OVX rats started after 1-month post-ovariectomy and proceeded for one month. The experimental animals were divided into five groups; sham-operated, OVX-, OVX-FLX (20 mg kg-1, i.p., daily), OVX-E2 (100 µg kg-1, i.m., every other day) and OVX-CUR- (100 mg-1. kg-1.p.o., daily) treated groups. The results showed that CUR modulated the depression-like behaviour using forced swimming test. It improved the serotonin content in many brain regions by upregulating tryptophan hydroxylase-2 and 5-hydroxytryptophan1A&2A receptor mRNA and downregulated MAO-A mRNA in the limbic system. Furthermore, it upregulated aromatase and BDNF mRNA and extracellular-regulated kinase 12/ protein in the limbic system, relative to FLX and E2, compared to OVX-group. In conclusion, CUR appears to be safe and efficient agent as serotonin modulator similar to FLUX and neurotrophic agent like E2, in improving the depression-like behaviour in OVX-rats.

PC-04

Impact of Silymarin or Grape Seed Extract on Neurotoxicity Induced by Aluminum Chloride in Rat

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The present study was designed to examine the protective effect of silymarin or grape seed extract (GSE) on aluminum-induced neurotoxicity in adult male rats. The rats were allocated to six groups, normal, Aluminum chloride (AlCl3)-intoxicated (17 mg/kg), silymarin (200 mg/kg), GSE (100 mg/kg), silymarin+AlCl3 and GSE+AlCl3. All treatments were daily administrated for one month. AlCl3 induced a significant decrease in nitric oxide (NO), GSH levels, SOD and CAT activities. Meanwhile, increased MDA level in whole brain. Dopamine (DA), norepinephrine (NE) and serotonin (5-HT) contents were decreased. However, acetylcholinesterase (AchE) and monoamine oxidase (MAO) activities were increased in the selected brain regions. Immunohistochemical study showed elevation in cysteine-aspartic protease 3 (caspase 3), along with reduction nitric oxide synthase (NOS) and cell lymphoma 2 (Bcl2) in brain of AlCl3-intoxicated rats. Histopathological examination supported these observations. Treatment with either silymarin or GSE with AlCl3 ameliorated the alteration in the neurochemical biomarkers induced by Alcl3. These results provide evidence that silymarin or grape seed extract may have potential protective effects on neuronal damage induced by AlCl3.

PC-05

Montelukast Attenuates Rotenone-Induced Microglial Activation/P38 MAPK Expression in a Rat Model of Parkinson's Disease: Pathways Targeting its Antioxidant, Anti-Inflammatory and Antiapoptotic Effects

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Montelukast (MK) is a cysteinyl leukotriene (CysLT1) receptor antagonist that recently exhibited remarkable neuroprotective activity in various neurodegenerative disorders. However, its neuroprotective effect against rotenone-induced Parkinsonism (PD) remains vague. Therefore, the aim of this study is to elucidate the neuroprotective effect of MK in rotenone-induced PD model in rats. Rotenone was administered as 1.5 mg/kg (s.c.), MK (10 mg/kg, i.p.) for 21 days. Rotenone treatment led to significant reduction in motor functioning and elevation in oxidative stress markers. Additionally, upregulation of p38 mitogen-activated protein kinase (p38 MAPK) expression and enhanced expression of CysLT1 receptor, P53 expression and cleaved caspases-3 activity were observed. Immunohistochemical reduction in tyrosine hydroxylase (TH) immunoreactive neurons and striatal dopaminergic neurons loss was also noted. MK administration significantly re-balanced all the aforementioned parameters. In conclusion, MK endowed neuroprotective effects in rotenone-induced PD animal model via attenuation of microglial cell activation and p38 MAPK expression.

PC-06

The Evaluation of the Therapeutic Potential of Moringa Oleifera and Wheat Germ Oil Versus the Effect of N-Acetyl Cysteine in Paracetamol-Induced Hepatotoxicity in Rats

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Paracetamol affects the liver function even in a therapeutic dose. Paracetamol toxicity is treated by N-acetyl cysteine (NAC).But many studies reported that about 3% of cases treated by NAC suffered from anaphylactoid reactions. So, there is a trend toward the use of natural products as an alternative therapy to NAC. In this study, 60 male Wistar rats were divided into 5 groups; in the early stage (07- days) Gp. I received distilled water (no significant difference between groups received distilled water or corn oil), Gp. II received paracetamol (600mg kg-1 p.o.), Gp. III received PCM then NAC (100mg kg-1 p.o.), Gp. IV received PCM then Wheat germ oil (WGO) (93 mg kg-1 p.o.) and Gp. V received PCM then Moringa oleifera (MO) (200mg kg-1 p.o.). In the late stage, groups stopped insulting by PCM, but they received the treatment for 28 days. Half of the animals in each group have been sacrificed on 8th day “early stage”, and the remaining were sacrificed on 29th day “late stage”. NAC, WGO, and MO significantly reduced serum levels of transaminases (ALT & AST), malondialdehyde, myeloperoxidase and tumor necrosis factor-alpha in PCM-treated rats. They also significantly raised the level of the whole blood lysate reduced glutathione. The results showed that NAC, WGO, and MO attenuated PCM-induced hepatotoxicity in both stages. These biochemical changes correlated positively with histopathology and immunohistochemistry of heme-oxygenase-1 and nuclear factor kappa B changes. Results showed the possible effectiveness of NAC, MO, WGO in liver protection against PCM- induced hepatotoxicity.

PC-07

Effects of Quercetin and Liraglutide on High-Fat Diet/Streptozotocin-Induced Type 2 Diabetes in Rats

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The development of complementary treatment strategies that focuses on achieving a balance between adaptive and apoptotic unfolded protein response (UPR), enhancing endoplasmic reticulum (ER) homeostasis, and thus preserving Beta cell mass and function is particularly warranted. This study was designed to investigate the effectiveness of the combined treatment by Quercetin (QUE) and Liraglutide (LIRA) in modulating hyperglycemia, insulin-insensitivity, UPR/ER stress markers, apoptosis, oxidative stress and inflammation using a high-fat diet/streptozotocin-induced type 2 diabetic rat model. Sixty male albino rats were allocated into five equal groups: normal control, diabetic control, LIRA treated diabetic; QUE treated diabetic and combined treatment diabetic groups. Fasting glucose, insulin, CHOP, macrophage inflammatory protein-1 α(MIP-1α) and Bax, Bcl2 levels were estimated by ELISA; mRNA expression levels of the spliced X-box binding protein 1 (XBP1) were estimated using quantitative real-time RT-PCR, while MDA, advanced oxidation protein products, reduced glutathione levels and protein disulfide isomerase (PDI) activity were evaluated spectrophotometrically. Pancreatic tissues were also subjected to histopathological examination. The combined treatment with both LIRA and QUE causes significant improvements in all the studied parameters; including XBP1 splicing, CHOP, MIP-1α, Bax/Bcl2 ratio, PDI activity, as well as oxidative stress markers as compared to either treatment alone. It also attenuated pancreatic histopathological damage. Our study nominates this combination to be used in T2DM to achieve adequate glycaemic control and to preserve optimal Beta cell function

PC-08

Nano-particulate Atorvastatin Formulation Recedes Muscle and Liver Damage When Combined with Coenzyme Q10 and/or Vitamin E in Hyperlipidaemic Rats

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Statins are the most widely used agentsh that lower elevated low-density lipoprotein levels and prevent cardiovascular diseases in umans. However, about 20% of patients treated with this medication suffer from statin-related myalgia. To this end, this study investigated the potential effect of nano-particulate formulation in alleviating the muscles and liver damage either alone or when co-administered with nano coenzyme Q10 (CoQ10) and nano vitamin E. Male Wistar rats were fed normal diet or high-fat diet for 12 weeks, following which rats were treated with either (i) atorvastatin (5 or 20 mg/kg/day, p.o.) or (ii) atorvastatin with CoQ10 (10 mg/kg/day, p.o.) (iii) and/or vitamin E (30 mg/kg/day, p.o.) in free particle or nanoparticle forms for another 4 weeks. In all rats, serum total cholesterol (CH), triglycerides (TGs), low (LDL) and high (HDL) density lipoproteins, alanine (ALT) and aspartate (AST) transaminases, alkaline phosphatase (ALP), creatine kinase (CK), albumin (ALB), as well as hepatic malondialdehyde (MDA) and antioxidants; reduced glutathione (GSH) and superoxide dismutase (SOD) were measured. Additionally, quadriceps muscles and liver tissues were used for histopathological examination. The antihyperlipidemic effect of statins was not altered when formulated as nanoparticles; albeit the former showed a prominent reduction in the liver and muscle enzymes and histopathological alterations together with a marked decline in the oxidative stress as compared to the free particulate form. These results were augmented when atorvastatin was combined with CoQ10 and/or vitamin E. Nano-particulate formulation alleviated statins-induced liver and muscle damage especially when combined with CoQ10 and/or vitamin E.

PC-09

2-Methoxyestradiol (2-ME2) Ameliorates Radiation-Induced Lung Injury by Targeting Multiple Signaling Pathways

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Radiation therapy (RT) is an essential therapeutic modality for treating lung, esophageal, breast and lymphoma cancers. Inevitable exposure of lung to ionizing radiation during (RT) can cause radiation induced lung injury (RILI) which may result in significant morbidity and mortality. Currently, there are no efficacious, non-toxic radioprotective agents for RILI.

Aim of the work: The aim of this work is to test the hypothesis that the natural estrogen metabolite 2-Methoxyestardiol (2-ME2) would provide a robust protection/mitigation of RILI by targeting multiple signaling pathways.Mice were exposed to irradiation (10 Gy, single thoracic dose) and/ or 2-ME2 (50 mg/kg/day, i.p for 4 weeks, started 2 days before irradiation). Random sample of mice (n=5) from each treatment and control groups were sacrificed at 1, 3, 7 days and 5 months post-irradiation to assess the effect of different treatments on early and late stages of radiation-induced lung damage. The following parameters were determined: the survival and the body weight of mice; respiratory functions; histopathological examination of lung tissues and pleural effusion; expression and signaling of several cytokines and mediators (CD68, TNF-α, TGFβ, HIF-1-α) pertinent to RILI and fibrosis.Treatment with 2-ME2 ameliorated RILI as evidenced by improvement of lung functions, reduction of interstitial macrophages in lung tissues with concomitant increase of alveolar macrophage in bronchoalveolar lavage. Furthermore, treatment with 2-ME2 reduced inflammatory cell infiltration in the lung and decreased the expression of pro-inflammatory and profibrotic cytokines.These findings suggest that 2-ME2 may be a promising candidate for prevention of RILI.

PC-09

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ANALYTICAL AND PHYSICAL CHEMISTRY

AC-01

Application of Aspects of Green Analytical Chemistry on Drug Analysis Using Potentiometric Analysis (Ion Selective Electrodes

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The possibility of obtaining analytical signals without sample pre-treatment or derivatization is the most environmentally friendly method of analysis. The aim of work was to develop new, eco-friendly, economic and portable ion selective electrodes which can be used in routine quality control for the green determination of each of Clidinium Bromide (CB) and Trifluperazine Hydrochloride (TFP) in their drug substances and in available pharmaceutical formulations without the need of preliminary extraction or separation steps. For CB, two sensors were proposed. Sensor (1) was PVC-Carboxylate membrane was used as an electro active substance then of ß- CD was added in sensor (2). The potentiometric response of the two suggested electrodes was found to be linear over a conc. range of 1×105- M to 1×102- M for sensor (1) and 1×106- M to 1×102- M for sensor (2). Sensor (1) was found to be more selective than (2) while the latter was found to be more sensitive.The suggested electrodes exhibited a Nernstian slope of 61.13 and 51.00 per decade for sensors 1 and 2, respectively in the pH range of 3.08.0-. For TFP, two sensors were proposed. Sensor (1) ß- CD was incorporated with PVC-Carboxylate as electroactive substances in the membrane while in sensor (2), PVC and Sodium Tetraphenyl borate were used, The suggested electrodes exhibited a linear response with a Nernstian slope of 60.24 and 60.00 per decade for sensors (1) and (2), respectively over a conc. range of 1×106- M to 1×103- M, in the pH range of 5.08.0-. The methods were validated with respect to linearity, precision, accuracy, ruggedness and robustness. Methods were compared to the reported conventional HPLC method for CB and the official method for TFP regarding their greenness profile. The suggested methods were found to be greener and more time- and solvent-saving than the reported ones; hence they can be used for routine analysis of the studied drugs without harming the environment.

AC-02

Development and Validation of Spectroscopic Methods for Estimation of Dabigatran Etexilate Mesylate in Pharmaceutical Dosage Forms

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Four simple, sensitive, selective and reproducible spectroscopic methods for the determination of Dabigatran etexilate mesylate (DEM) in pharmaceutical formulations are developed and validated. The first three methods are stability indicating spectrophotometric methods. Method A is a ratio difference method, which determines the difference in amplitudes between 315 and 356 nm of the ratio spectra of DEM. Method B is the mean centering of ratio spectra, which measure the peak amplitude of DEM at 357 nm. Method C is the first derivative of the ratio spectra that is done by measuring the peak amplitude of DEM at 229.70 nm. All the methods are done in presence of up to 30% of its degradation products

without any interference. DEM is determined over a concentration range of 417- µg mL-1 for method A, B and 324-µg mL-1 for method C and with mean percentage recoveries of 99.120.91±100.10 ,0.43± and 99.310.65± for method A, B and C respectively. The fourth method is a spectrofluorimetric method where the native fluorescence of the DEM at 398nm upon excitation at 321nm is measured over concentration range of 0.26-µg mL-1 with mean percentage recovery of 99.770.39±. The four proposed methods are successfully applied to the analysis of DEM in pharmaceutical dosage form without interference from additives. ICH guidelines are applied throughout the work for method validation. The results are statistically compared with a reported method with no significance difference.

AC-03

Host-guest Complexes CD-Nadifloxacin and its Spectrofluorimetric Applications in Human Plasma and formulations

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This work is focused on using different techniques for the determination of nadifloxacin (Nadi) and β-cyclodextrins (β-CD), methyl β-cyclodextrins (M β- CD), carboxymethyl β-cyclodextrins (CM β- CD) and hydroxypropyl β-cyclodextrins (HP β- CD), fluorescence spectroscopy, UV-vis, and FTIR. The first method depends on measurement of native fluorescence intensity of drug at ג emission 460nm using ג excitation 360nm. Comparative study of the fluorescence spectral properties of Nadi was also achieved in presence of different types of ß- cyclodextrins.Quantum yield and formation constant (K) values were calculated. Furthermore, the thermodynamic parameters (ΔH°, ΔS° and ΔG°)correlated to the inclusion process were also determined. For all the suggested methods under the optimum condition and experimental parameters, linear relationships and good correlation coefficients (0.99950.9998-) were found between fluorescence intensity and the concentration range of the investigated drug. The proposed methods were successfully applied to the determination of Nadi in drug substance, drug product, and spiked human plasma.The results obtained were statistically comparable with those obtained by official methods. The method was validated according to USP guidelines. The developed method is specific, accurate and suitable for quality control and routine analysis of cited drugs in their pharmaceutical products and spiked human plasma.

AC-04

Rapid micellar HPLC analysis of Clorsulon, Albendazole, Triclabendazole and Ivermectin using monolithic column and UV detection

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Clorsulon, Albendazole, Triclabendazole and Ivermectin are anthelmintic drugs used to treat parasitic infections. This study reports for the first time about micellar HPLC method for the analysis of this mixture using a mobile phase with less quantity of organic modifier and generate less amount of toxic waste in comparison to aqueous-organic solvents, non-inflammable, biodegradable, and relatively inexpensive. A rapid, simple and sensitive micellar liquid chromatographic method is developed for the simultaneous determination of clorsulon, albendazole, triclabendazole and ivermectin using

metronidazole as an internal standard. Separation was performed using a monolithic column with a mobile phase composed of 120 mM sodium dodecyl sulfate, 15% propanol and 15 mM orthophosphate buffer, adjusted to pH 5.5 and pumped at a flow rate of 1.4 mL/min. The eluted analytes are monitored with UV detection at 225 nm. The developed method is linear over the concentration range of 0.625–25 µg/mL for clorsulon, albendazole and triclabendazole, 30–300 µg/mL for ivermectin. The method detection limits are 0.162, 0.25, 0.27 and 6.15 µg/mL and the limits of quantification are 0.54, 0.83, 0.89 and 20.49 µg/mL for clorsulon, albendazole, triclabendazole and ivermectin respectively. Validation of the developed method reveals accuracy higher than 97% and intra- and inter-day precisions with relative standard deviations not exceeding 2%.The method can be successfully applied to the determination of four analytes in pharmaceutical preparation with run-time of less than 8 min. The method is ideally suited for use in quality control laboratories.

AC-05

Development and Validation of New Stability Indicating Methods for Determination of Tenofovir Alfinamide in Pure Form and Tablet Dosage forms

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Tenofovir Alfinamide is a nucleotide reverse transcriptase inhibitor and a prodrug of tenofovir. It is used in the treatment of HIV infection and chronic hepatitis B. This study reports for the first time about stability-indicating UPLC and HPTLC methods for the quantitative determination of Tenofovir Alfinamide in presence of its degradation products. Two simple, precise, rapid and sensitive stability- indicating methods were developed and validated. The first methodwas Ultra Performance Liquid Chromatography (UPLC) method, in which the chromatographic separation was performed on phenomenex kinetex 2.6 µm C18 100 A column using a mobile phase consisting of mixture of methanol and acetonitrile (pH 3.5 adjusted by triethyl amine) in a ratio of (80:20 v/v) at a flow rate of 1 mL min-1, the detection was carried out using UV detection at 261 nm at ambient temperature. The second method depends on a high performance- thin layer chromatographic (HPTLC) determination of the drug at 260 nm using a mobile phase consisting of n-butanol – acetic acid – ammonia (5.5: 4: 0.5 v/v/v). The drug was subjected to stress conditions including alkaline and acidic degradation. Beer' law was obeyed over the range of 118-µg mL–1 and 0.14- µg / band for both methods; respectively.The results obtained were statistically analysed and was found to be in accordance with those given by the compendial method. The two proposed methods were successfully applied to analyse the drug in its pure and dosage forms.

AC-06

Some Molecular Rigidity Applications in Clinical Laboratories

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Molecular fluorescence enhancement occurs as a result of molecular rigidity. DNA stains are virtually non-fluorescent in the unbound form but become strongly fluorescent upon DNA binding as a result of imposed molecular rigidity upon uptake in the grooves of DNA helical structure. Some of these stains exhibit health hazards and Ethidium bromide, in particular, is suspected of causing genetic defects. We succeeded in preparing a new series of DNA fluorescent stains based on monomethine cyanine probes. The synthesized dyes possess the advantage of being synthesized under green solvent- free microwave irradiation.

Another application on the role of molecular flexibility in decreasing fluorescence efficiency is the 4-methy1-umbllifery1 caprylate (MUCAP) reagent which is used in the identification of salmonella bacteria. Traditional methods to detect salmonella depend upon growing cultures which is time–consuming. MUCAP reagent consists of a flexible eight carbon atom ester conjugated with methyumbelliferone. The non – fluorescent MUCAP substrate interacts with the salmonella C8 esterase in a specific manner leading to the release of highly fluorescent umbelliferone that emits strongly at 485 nm. We report the chemical hydrolysis of MUCAP that is expected to be a consecutive process that occurs alongside with enzyme-catalyzed hydrolysis. We also recorded fluorescence runs to compare MUCAP action on sterilized and inoculated agar and food samples to compare the time scales of enzyme and chemical MUCAP hydrolysis.

AC-07

Photophysical, Photochemical and Laser Behavior of Some Diolefinic Laser Dyes in Sol–Gel and Methyl Methacrylate/2-Hydroxyethyl Methacrylate Copolymer Matrices

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The photophysical properties and laser activity of 1,4-bis (β-Pyridyl-2Vinyl) Benzene (P2VB), 2,5-distyryl-pyrazine (DSP) and 1,4-bis(2-methylstyryl) benzene (MSB) diolefineic laser dyes have been measured in different restricted hosts. (P2VB), (DSP) and (MSB) are embedded in transparent sol–gel glass and a copolymer of methyl methacrylate (MMA) and 2-hydroxyethyl methacrylate (HEMA) media.The three studied diolefinic laser dyes give emission in the UV-blue region which is important in many fields. The lasing properties and photostability of these laser dyes in sol–gel are studied and compared to copolymer matrices.

We conclude that the undoped sol–gel glass shows better transmission in the spectral range from 300 to 800nm compared with copolymer host. Intersystem crossing rate constants (kisc) are high in copolymer matrices compared with sol–gel glass leading to fluorescence quenching. Photo degradation rates in sol–gel are generally lower than in copolymer under N2 laser pumping with sol–gel presenting a more inert matrix compared with copolymer.

PHARMACOGNOSY & HERBAL MEDICINE

PG-01

Fluorouracil Cytotoxicity for Colorectal Cancer is Enhanced by Chitosan-Coated Cinnamon/Oregano-Loaded Solid Lipid Nanoparticles

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Colorectal cancer (CRC) is one of major causes of cancer death worldwide. Preclinical studies have reported anticancer activities of dietary phenolics through the regulation of different markers and signaling pathways. To date, polyphenols of different herbs especially cinnamon and oregano were used as an adjuvant in CRC management. The cytotoxicity of standard chemotherapy 5-fluorouracil (5-FU) and plants extracts was assessed using an MTT assay on HCT-116 cells after 24 h incubation. A single treatment with each sample exhibited a gradual decrease in cell viability as their concentration was increased reaching an IC50 of 12.16, 19.9, 29.8, 26.4, and 37.2µg/mL for 5-FU, cinnamon extract (CI), oregano extract (OR), encapsulated cinnamon (CI-NPs) and encapsulated oregano (OR-NPs), respectively. Co-administration of half IC50 of each extract with half IC50 of 5-FU exhibited higher inhibition percentage of cancer cells reaching 61.3% and 56.4% for CI and OR, respectively, which is higher than the inhibition percentage of each individual extract or theoretical added inhibition percentage (50%). This confirms the synergistic effect of co-administered free extracts with 5-FU. Half of IC50 of 5- FU with CI and OR achieved the highest inhibition percentage reaching 71.1% cell inhibition. On the other hand, similar synergistic patterns were observed in encapsulated extracts where combining CI-NPs, OR-NPs and CI-NPs + ORNPs with 5-FU exhibited lower inhibitory effect than free extracts 57.7%, 50.8%, and 62.8%, respectively. These results confirm the benefit of synergistic activity of combining different plant extracts like cinnamon and oregano with standard chemotherapy drugs like 5-FU.

PG-02

Evaluation of Antimicrobial Activity of Some Medicinal Herbs That Grow in Egypt

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A wide range of medicinal plant parts is used for extracting raw drugs as they possess varied medicinal properties. This study aimed to test a variety of some naturally occurring medicinal herbs and their extracts for their antimicrobial potential against a group of some bacterial and fungal pathogens. A total of 6 herbs (Thymus vulgaris, Foeniculum vulgare, Datura stramonium, Matricaria chamomilla, Ammi visnaga linne and Cassia angustifolia) collected from famous Egyptian plant dealers; GC-MS (Gas Chromatography-Mass Spectrometry) analysis was carried out for active one. The antimicrobial activity of aqueous, Methanol and Petroleum ether extracts were assisted by measuring the inhibition zone by agar well diffusion method and minimum inhibitory concentration (MIC). As for methanolic extracts and irrespective of the examined species, their Activity indices compared to the reference antibiotics, ranged between 0.521 to 1.071 for the examined molds whereas candida albcans was antagonized only with thyme methanol extract with a relatively moderate AI, 0.976 an indicative that this yeast species is not sensitive to the others examined herbs. It was found that Thyme either methanolic and ether extracts are most active against both Staphylococcus aureus and Bacillus subtilis (0.0150.03- and 3.91.95- mg/ml) and nil or very weak for Fennel and Senna respectively. The GC-MS analysis revealed the presence of 18 peaks (4 belonged to Thymol) in Thyme essential oil which indicating the presence of 18 phytochemical constituents representing 99.98% of the oil.

PG-03

Terezine E, bioactive prenylated tryptophan analogue from an endophyte of Centaurea stoebe

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In current years, microorganisms associated with plants instead have proved to produce bioactive compounds with potent pharmacological and therapeutic activities. Fungal endophytes are considered promising sources of new bioactive natural products. In this study, a Mucor sp. has been isolated as an endophyte from the medicinal plant Centaurea stoebe. Static culture in medium M5 which consisted of glycerin (20 g/L), glucose(2 g/L), peptone (10 g/L) and sodium chloride (0.5 g/L), followed by extraction with ethyl acetate which yielded an extract with a dry weight of 13 g which was subjected to different chromatographic methods for isolation of bioactive compounds.The extract of the endophyte revealed potent cytotoxicity against HeLa cell lines and strong cytostatic effect against HUVEC and K-562 cell lines. Bio-guided screening of this extract led to the isolation of two metabolites. Through bioactivity-guided fractionation, the isolation of the new bioactive terezine E in addition to the previously reported 14-hydroxyterezine D was carried out. Both compounds exhibited potent anti-proliferative activity against K-562 and HUVEC cell lines.

PG-04

Secondary Metabolites and Hepatoprotective Activity of Euphorbia retusa

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Euphorbiaceae (Spurge family) is a large family, including 300 genera and over 5000 species. The genus Euphorbia is the largest in the family, a significant percentage mostly those originating in Africa and Madagascar, are succulent.This study aimed to explore the secondary metabolites from the methanolic extract of Euphorbia retusa forssk, as it is known for its use in folk medicine and for being rich in bioactive molecules.The methanolic extractwas fractionated by different chromatographic techniques and the structures of the isolated compounds were elucidated by UV, 1H and 13C NMR spectroscopy. Hepatoprotective activity of E.retusa extract was evaluated on CCl4-induced liver damage in rats through biochemical assessment of serum ALT as well as MDA, GSH and NO. Also, through histopathological study of liver autopsy samples.From the aqueous methanolic extract of Euphorbia retusa forssk.aerial parts seven known phenolic compounds; kamferol-3-O-β-D- glucopyranoside (1), quercetin -3-O-β-D-glucopyranoside (2), 3,3`dimethoxy ellagic acid (3), ellagic acid (4), gallic acid (5), kamferol (6) and quercetin (7) were isolated and identified by chromatographic and spectroscopic analysis. Administration of the extract (100 and 200 mg/kg body weight) significantly decreased the AST and ALT levels, inhibited the CCl4 -induced elevated levels of NO and MDA and increased the level of hepatic GSH. A comparative histopathological study of liver exhibited almost nearly normal architecture as compared to toxicant group.Euphorbia retusaextract has shown to have hepatoprotective activityon CCl4-induced liver damage in rats which might be attributed to its phenolic contents.

PG-05

HepatoprotectiveActivity ofCentaureaaegyptiacaL. onCarbonTetrachlorideInducedHepatotoxicity inRats

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Centaureaaegyptiaca L.,isgrowingwidelyin theEgyptianeastern desertand itsphenolicconstituentsarenotwellinvestigated.Thisstudy aimedtoisolatephenolic compoundsfrom the70%aqueousmethanolextractoftheaerialparts,evaluate in-vivohepatoprotectiveandin-vitro antioxidant activities anddeterminetotalphenolic and total flavonoidcontents.70%aqueousmethanol extractoftheaerialpartssubjectedto differentchromatographicseparationtechniques.Theidentitiesoftheisolatedcompounds wereestablishedon the basis of their spectraldataandcomparing withpreviously reported data. Thecrudeextractwasevaluatedforin-vivohepatoprotectiveactivityonCCl4-induced hepatotoxicityinratsand in-vitro antioxidant activity using DPPH and ABTS scavenging assays and BHA as a reference drug.Totalphenolicandtotalflavonoidcontentsweredeterminedusing Folin-Ciocalteu and aluminumchloride colorimetricmethods, respectively. The extract afforded six compounds. A phenolic

acid ester; protochatechuic acid methyl ester (1) along with four known flavonoids; apigenin-6-C-β-D-glucopyranoside (isovitexin) (2), apigenin-8-C-β-D-glucopyranoside (vitexin) (3), 3-O-methylquercetin (4) and quercetin (5) and a triterpinoid alcohol; lupeol (6).Theextract showedahepatoprotectiveactivitysimilartothat ofthestandarddrug;silymarin. Comparative histopathologicalstudy of liver exhibited moderate changes in liver histoarchitecturewhencomparedtotheCCl4group. It showed a more potent antioxidant activity than the standard drug; BHA. It alsoshowedhighconcentration ofphenolicand flavonoidcontents. Theaqueousmethanolextractoftheaerialpartsof C.aegyptiacaaffordedfivephenoliccompoundsforthefirsttime,withpromisingin-vivohepatoprotectiveand in-vitro antioxidant activities.

PG-06

Antimicrobial activity and comparative study of essential oils chemical composition of Pulicaria crispa (Forssk) and Pulicaria incisa (Lam) growing wild in Egypt as determined via headspace sampling and steam distillation

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Volatile profile in Pulicaria crispa and Pulicaria incisa aerial parts was determined viaheadspace (HS) and steam distillation. A total of 31 and 30 volatiles were identified in P. crispa and P. incisa volatile blends, respectively. p-Menthenone was found as the major constituent in the essential oil (76%) and HS (99%) samples of P. incisa respectively. In contrast, in the oil sample of P. crispa, p-Menthenone (48%) and hexanal (11%) were found as the major components, whereas β-caryophyllene (98%) was the main constituent of its HS sample. The oils were screened for antimicrobial activity against 4 microorganisms and showed antibacterial and antifungal activities against Staphylococcusaureus, Bacillus subtilis, Escherichia coli and Candida albicans.

MEDICINAL CHEMISTRY AND DRUG DESIGN

MC-01

Synthesis and Cytotoxic Activity of Certain 1,3-Benzodioxole and 1,4-Benzodioxin Derivatives

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A considerable amount of progress has been made in the field of cancer treatment. However, the current chemotherapeutic agents are associated with unwanted side effects and poor quality of life. Moreover, drug resistance is also a rising issue with current therapies. Therefore, there is an urgent need to develop novel cancer therapeutic agents which are effective against the disease and can improve quality of life. The 1,3-benzodioxole moiety is found in several natural and synthetic anticancer agents such as podophyllotoxin, steganacin, etoposide, teniposide, 4,7-dimethoxy-5-methyl-1,3-benzodioxole (SY-1) and 4,7-dimethoxy-5-(2-propen-1-yl)-1,3-benzodioxole (apiole). Furthermore, the 1,4-benzodioxin ring system is a pharmacophoric coremet with many potent antitumor compounds. In this work several benzodioxole and benzodioxin derivatives were synthesized from gallic acid (1) which was esterified using p-toluene sulphonic acid as a catalyst to obtain ester 2. The latter ester 2 was subjected to selective etherification using borax and dimethyl sulphate to obtain methyl methoxy gallate (3). Subsequent cyclization of 3 using dichloromethane or 1,2 dichloroethane gave the corresponding 1,3-benzodioxoleand1,4-benzodioxinderivatives 4,respectively. Hydrazinolysis of 4 yielded the corresponding hydrazide 5. Finally, the hydarzides 5 were subjected to different chemical reactions to obtain the target compounds.The structures of the new intermediates and the target compounds were confirmed by elemental analyses as well as IR, MS and NMR spectral data. The final compounds were screened for their cytotoxic activity against HepG2, PC3, MCF7 and A549 human carcinoma cell lines using MTT assay.

MC-02

TitleSynthesis and Biological Evaluation of New Benzopyrone Derivatives as Antimicrobial and Photochemotherapeutic Agents

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Novel series of benzopyrones, angular furobenzopyrones,tetrahydrobenzo-furobenzopyrones, and benzofurobenzopyrones were synthesized andscreened for antimicrobial and photochemotherapeutic activities. Five compoundsshowed activity against all examined strains of Gram-positive bacteria (B. subtilis andS. aureus), Gram-negative bacteria (E. coli) and yeast (C. albicans) proposing a broadspectrum of antimicrobial activity. Interestingly, three other compounds exhibited lowIC50 values against E. coli DNA gyrase. Furthermore, two furobenzopyronederivatives revealed the highest photosensitizing activity. Molecular docking study ofactive antibacterial compounds against DNA gyrase enzyme exhibited a similarbinding mode to clorobiocin, a DNA gyrase inhibitor.

MC-03

Synthesis and Anticancer Evaluation of Some New 3-Benzyl-4,8-Dimethylbenzopyrone Derivatives

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New benzopyrone derivatives such as Schiff's like compounds, acetohydrazides or substituted with oxadiazole or pyrazole heterocycles were synthesized from parent acid hydrazide compound 3. The synthesized compounds were elucidated using IR, NMR and mass spectroscopy. All the synthesized derivatives were selected by National Cancer Institute (NCI), Bethesda, and evaluated for theirin vitroanticancer activity in the full NCI 60 cell lines panel assay. Schiffs like compounds 4a, b and cwere found to have good growth inhibition % against numerous cell lines that belong mainly to leukemia, non-small cell lung, CNS and breast Cancer subpanels.

MC-04

Validated LC-MS/MS method for simultaneous determination of linagliptin and metformin in spiked human plasma coupled with solid phase extraction: Application to a pharmacokinetic study in healthy volunteers

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Combination therapy has a pivotal role in type II diabetes mellitus management in patients unable to maintain normal glycemic level using metformin alone. Addition of linagliptin, dipeptidyl peptidase-IV inhibitor, to metformin improves glycemic control. This study is concerned with the development of an HPLC-MS/MS method for simultaneous quantification of linagliptin and metformin in spiked human plasma. The method was applied to evaluate the potential pharmacokinetic interactions between the cited drugs in healthy volunteers. Solid-phase extraction was applied using Strata™ X cartridge. Separation was carried out on Symmetry® C18 column using methanol: 10 mM ammonium formate buffer (containing 0.2 % formic acid) in a ratio of (95: 5, v/v) as mobile phase at flow rate 0.25 mL min-1. Quantification was performed with multiple reaction monitoring in positive ionization mode. The monitored transitions were set at m/z 473.24 → 419.94, 130.14 → 60.18 and 340.27 → 116.07 for linagliptin, metformin and alogliptin (internal standard), respectively. The method was validated according to FDA guidelines. The method showed excellent linearity over concentration ranges 0.2510- and 252000- ng mL-1 for linagliptin and metformin, respectively. The percentage mean recovery of linagliptin is in the range of (85.38 % ± 3.784 to 114.34 % ± 2.171), while that of metformin is in the range of (85.30 % ± 3.784 to 107.32 % ± 2.312). The validated HPLC-MS/MS method was successfully applied to pharmacokinetic study of linagliptin and metformin in healthy volunteers after oral administration of Jentadueto® tablets.

BIOCHEMISTRY AND BIOTECHNOLOGY

BC-01

Developing RPA Microfluidic Device for Rapid Detection of HCV as point-of care test

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Nucleic acid amplification is the most sensitive and specific method todetect HCV. However, the polymerase chain reaction remains laboratory-based and has to beconducted by trained personnel, needs expensive equipment and can't be applied as point-of-caretest. Developing rapid, accurate, inexpensive method of detection as point-of-care test,available in pharmacies and can diagnose most HCV genotypes. The new method
depends on Recombinase Polymerase Amplification (RPA) assay- doesn't require thermocycling- by making centrifugal microfluidic cartridge including restored RPA Mixture inaddition to immobilized probes can detects several types of HCV genotypes. The method appliedon 50 blood samples collected from Tanta, Benha and Cairo. Reaction conducted under 3045°-Cwithin 35 min. The results visualized by gel electrophoresis with ethidium bromide staining anddetected by the naked-eye after adding SYBR Green I .Then comparing the results with nested PCR test. The methods how showed high specificity and sensitivity.Detection limit asl0 was100 of genomic HCV. When visualized by gel electrophoresis and ethidium bromidestaining. The HCV RPA assay products appeared in pattern with many bands. The color of SYBRGreen I changed from orange to green in positive samples. The new assay managedpatients to do screening to themselves by only one drop of blood in 35 min withoutthermocycler. The HCV RPA microfluidic device had the same sensitivity as a nested – PCRassay and easier to use. It can be available at pharmacies by cost less than 5$ and in country likeEgypt this price is affordable for all people.

BC-02

Gold Nanoparticles - an Optical Biosensor for the direct RNA Quantification for Cancer, Neurological Disorders and Hepatitis C Virus Diagnosis

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The unique physicochemical properties of gold nanoparticles (AuNPs) have been exploited to develop Gold Aggregating Gold (GAG) approach. Quantification of HCV RNA is a cornerstone in the infection management. On the other hand, Topoisomerase 1 (TOP1) and Tyrosyl DNA Phosphodiesterase 2 (TDP2) were among the transcripts of choice due to their role as genomic stability biomarkers and their implication in various cancers and neurological disorders. The existing technologies are expensive, labour intensive and time consuming, posing significant limitations to their wide-scale exploitation, particularly in economically deprived populations. We havedeveloped for the first time; cationic AuNPs to induce aggregation of citrate capped AuNPs decorated with RNA of interest specific probe (nanoprobe). TOP1, TDP2 and HCV RNA were first captured specifically using magnetic nanoparticles that were functionalized with a TOP, TDP2 and HCV -specific probes in serum specimens, respectively.

The captured unamplified mRNA was then directly detected and quantified using GAG assay. Solution colour was developed immediately. RNA quantification was done by recording the spectral absorbance ratio of non-aggregated AuNPs to the aggregated nanoparticles (530650/) against a standard curve of serial diluted RNA of interest.In positive samples, the AuNPs solution retained its red colour, while in negative samples the colour changed to blue. A linear correlation exists between the GAG assay and the qPCR for the quantification of the RNAs (101 to 104 copies), with detection limit of up to 10 copies per reaction. Wild-type and TDP2-deficient cell lines confirmed the assay specificity and reproducibility in distinguishing between different transcripts. The novel GAG assay can be utilized as an inexpensive, rapid, simple and sensitive tool for the absolute quantification of RNA from different origins and for different applications, instead of the laborious, expensive and sophisticated real-time PCR. Moreover, it could readily be adopted for full automation.

BC-03

miR-542 and miR-221 expression profiles in HCV mediated HCC Egyptian Patients

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HCV infection affects 71 million individuals worldwide where 85% develop chronic HCV (CHC) which could progress into cirrhosis and hepatocellular carcinoma (HCC). The latter is the second leading cause for cancer related mortalities. So far, there is no reliable, cost effective, non-invasive, sensitive biomarkers for HCV mediated hepatic disorders. Exosomal miRNAs have recently drawn great attention as promising non-invasive biomarkers for various diseases. We aimed at investigating miR-221 and miR-542 expression profiles in HCV mediated HCC Egyptian patients for possible use in early detection and prognosis of HCV mediated hepatic diseases. 135 Egyptians (36 controls, 31 CHC, 32 cirrhotic and 36 HCC) participated in this study. Total RNA was reverse transcribed, PCR amplified and quantified. Differential gene expression was calculated based on ΔΔCt method. ROC curve and logistic regression (LR) were also performed. There was significant up-regulation for miR-221 & miR-542 in chronic, cirrhotic and HCC cases (P= 0.003 & 0.013 respectively). HCC miR-221 levels exhibited significant 3.6-fold increase (P=0.004 & 0.026) against chronic and cirrhotic cases with AUC values of 0.698 (P= 0.0019). Cirrhotic miR-542 levels increased significantly (P=0.017 & 0.044) with 1.7-fold change against HCC and chronic. Furthermore, logistic regression revealed that combining both miR-221 and miR-542 would differentiate cirrhotic patients from HCC cases with an AUC value of 0.714 (P = 0.0012). Circulatory miR-542 and miR-221 levels could be possibly used as non-invasive biomarkers for differentiating HCV mediated HCC progression.

DAY 2

Topic	Code
Pharmaceutics and Drug Delivery	PT
Microbiology and Immunology	MB
Clinical Pharmacy & Pharmacy Practice	CL
Pharmaceutical Organic Chemistry	OC

PHARMACEUTICS AND DRUG DELIVERY

PT-01

Formulation and In Vitro /Ex Vivo Characterization of Chlorhexidine Hydrochloride Nanoemulsion as Root Canal Irrigant

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The purpose of the study was to improve the penetration ability, cleansing and antibacterial effect of Chlorhexidine hydrochloride (Chx.HCl) using a newly formulated Chx.HCl nanoemulsion and use it as root canal irrigant. Chx.HCl nanoemulsions were prepared using two different oils; Oleic acid and Labrafil M1944CS, two surfactants; Tween 20 and Tween 80 and a co-surfactant; propylene glycol. Pseudoternary phase diagrams were constructed to designate the optimum systems. The prepared nanoemulsion formulae were evaluated for their drug content, emulsification time and dispersibility. Droplet size, in-vitro drug release and thermodynamic stability were also done. Chx.HCl nanoemulsions with two different concentrations (0.75% and 1.6%) in comparison to Chx.HCl (commercial product) as root canal irrigants were tested for their penetration ability, cleansing effect and antibacterial effect. The formula (F6) with the composition of 2% Labrafil, 12% Tween 80 and 6% propylene glycol was selected for having a small particle size (12.18 nm), short emulsification time (1.67 seconds), and fast dissolution rate after 2 min. It was found to be a thermodynamically/physically stable system. The nanoemulsion with higher Chx.HCl concentration (1.6%) showed better penetration ability compared to Chx.HCl (commercial product) due to smaller particle size. Chx.HCl nanoemulsion 1.6% had lower mean value of the remaining debris surface area (2001.47µm2) when compared to commercial material (2609.56 µm2) indicating better cleansing ability. Chx.HCl nanoemulsion 1.6% showed better antibacterial effect and it was highly effective on Enterococcus faecalis. A complete eradication of the bacterial cells was achieved.

PT-02

Formulation and Pharmacokinetic Evaluation of Telmisartan Orodispersible Tablets

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Telmisartan is a potent antagonist of angiotensin II type-1 (AT1) receptor that is indicated for the treatment of essential hypertension. The objective of the present study was to enhance the physical and chemical properties of telmisartan, specifically its solubility in aqueous media by means of design, evaluation, and pharmacokinetic study of solid dispersion of the drug in different carriers. Telmisartan solid dispersions were prepared and evaluated in comparison to plain telmisartan, systems showed best dissolution profile were further evaluated. Sixteen different formulae were prepared using four different readymade co-processed excipients with selected surface solid dispersions of telmisartan. A formula was selected for pharmacokinetic and clinical studies based on physicochemical characteristics.

. The pharmacokinetic study was conducted on human volunteers and the bioequivalence of the test formula with the commercial products was evaluated. Analytical methods using liquid chromatography were developed and validated to be used to determine drug concentration in plasma. Formation of telmisartan solid dispersions using combined carriers showed an increase in telmisartan solubility. Solid dispersions showed different dissolution profiles thus nature of carrier used played an important role in the enhancement of dissolution rate. The bioavailability study showed that the test formula O8 was bioequivalent to the reference. It was concluded that the work in this study successfully improved the solubility of telmisartan thus improvedits bioavailability after oral administration. This leads to the development of a quality-improved dispersible tablet formula without the aid of strong alkalizing agent which will reduce the production cost and time and enhance patient compliance.

PT-03

Novel Carvedilol Loaded Leciplex Nanoparticles for Glaucoma Treatment

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The aim of the study was to formulate carvedilol loaded leciplex to enhance transcorneal permeation of drug as recent studies pointed out the effect of topical carvedilol on intraocular pressure and suggest the drug as potential therapy for glaucoma, therefore carvedilol loaded cationic nanoparticles leciplex containing cetyltrimethylammonium bromide (CTAB) or didodecyldimethylammonium bromide (DDAB) and soybean lecithin in molar ratio (1:1) were fabricated in single step and characterized for morphology, encapsulation efficiency, particle size, zeta-potential and ex vivo corneal permeation study. Leciplex nanocarriers appeared spherical in shape using transmission electronic microscopy. There was no significant difference between DDAB leciplex and CTAB leciplex in term of encapsulation efficiency while DDAB leciplex showed significant smaller average particle size 16.04 ±1.2 nm compared to 91.481.8± nm revealed by CTAB leciplex, also DDAB Leciplex showed higher zeta value +53.9 mv compared to CTAB leciplex 34.5 mv. The ex-vivo transcorneal permeation study showed that DDAB leciplex formula revealed enhanced permeation parameters compared to CTAB leciplex and carvedilol solution, therefore carvedilol loaded DDAB leciplex could be considered as a promising transcorneal formula for glaucoma treatment.

PT-04

Formulation and Evaluation of Betahistine Dihydrochloride Lyophilized Nasal Insert

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Betahistine dihydrochloride (BD) is used to reduce the symptoms of vertigo, tinnitus and hearing loss associated with Ménière's disease. BD causes a gastrointestinal disturbance as a side effect. The objective of the present investigation is to develop an intranasal insert which provides prolonged residence of the drug formulation in the nasal cavity in order to improve the bioavailability of the drug. The intranasal inserts were prepared by applying the freeze-drying technique to one ml gel solution that was prepared using different ratios of xanthan gum and guar gum in addition to agar and mannitol. The prepared gel solutions were tested for appearance, pH, drug content and viscosity. The prepared inserts were evaluated for appearance, drug content, bioadhesion potential, water uptake, in-vitro drug release/permeation and were scanned by X-ray diffraction. The Gel solutions were found to be homogenous, transparent, with a pH range of (5.56.5-), all BD gel formulae showed a pseudoplastic behavior. Also, the results showed that the prepared nasal inserts are off-white in color with a smooth texture and a spongy-like appearance. The in-vitro release of drug from inserts showed ~100% drug release within 4 hours. The X-ray diffraction showed a reduction in the crystalline nature of BD after being involved in the formula and freeze-dried. The study revealed the importance of nasal inserts in terms of ease of administration, the accuracy of dosing, prolonged nasal residence and improved nasal bioavailability.

PT-05

Novel Cubosome-Based Delivery System for Improvement of Ocular Permeation of Acetazolamide

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Cubosomes, as dispersed colloidal particles of cubic phase liquid crystals, have many advantages for ocular drug delivery. Acetazolamide (ACZ), drug for treatment of glaucoma, has poor aqueous solubility and low corneal permeability that limits its ocular bioavailability. In the present study ACZ-loaded cubosomes were developed for ocular delivery aiming sustained effect, high corneal permeation and improved therapeutic efficacy with avoidance of its systemic side effects when taken orally. ACZ loaded-cubosomes were prepared by emulsification of cubic lipid phase consisting of different ratios of glyceryl monostearate (GMS) and polaxamer 407 in water containing different stabilizers. The cubosomal dispersions were characterized by determination of particle size, zeta potential, drug entrapment efficiency, pH, rheological properties and they were morphologically observed by TEM. Formulations of optimal physicochemical properties were subjected to ex-vivo corneal permeation. the cubosomal dispersion that were prepared with lipid /water ratio 1:25 containing 2.5% propylene glycol (PG), as a stabilizer, showed optimum particle size (359.5 nm), entrapment efficiency (59.8%) and the highest ex-vivo corneal permeability parameters. Acetazolamide formulated in cubosomal nano-dispersions successfully improved the corneal permeation of ACZ.

PT-06

Influence of Edge Activator Type on Ex-Vivo Half-Life of Phosphatidylcholine: Implementation of a Quality by Design Approach

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The pharmaceutical materials are formulated to specific dosage forms to be delivered to patients effectively. Quality by design (Qbd) in the pharmaceutical industry helps to understand how process and formulation variables affect product characteristics with subsequent optimization of these variables to meet final specifications. Design of experiments (DoE) is one of the most established methods for identifying and optimizing the important parameters in pharmaceutical dosage form design. The objective of the experiment is to determine which variables significantly influence the response near the desired optimal value. A three-factor, two-level randomized full factorial design was applied in the present study to optimize and identify the potential of different types and concentrations (Conc) of phosphatidylcholine (PC) and edge activators (EA, span 80 and sodium deoxycholate (SDC)) as independent variables on the Ex-vivo half-life of PC. The Ex-vivo half-life of PC was calculated from Ex-vivo cumulative permeated data using vesicular gel formulations (F1-F8). A statistical model incorporating interactive and polynomial terms was used to evaluate the response (2-way analysis of variance (ANOVA) at p-value‹0.05).In our study, the average half-life of the Ex-vivo PC permeated was in the range of 19.48 h (F7) to 48.99 h (F1). Regression analysis (2-way analysis of variance at p-value‹0.05) revealed the significant effect of all tested factors ($p<0.05$) on the T50 except factor F (interaction of EA Conc with PC Conc). The study indicates that the use of SDC has a predominant effect on the half-life of the Ex-vivo PC permeated in comparison to span 80.

PT-07

Comparative study of neuroprotective mechanisms of brain targeting stealth hybrid nanospheres of antiepileptic and non-streroidal anti-inflammatory model drugs vs. Anti-Parkinson's drug

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Parkinson's disease is increasingly propagating, threatening people's quality of life, with its challengeable treatment, owing to severe side effects of marketed drugs; Levodopa. In this study; a second-generation anti-epileptic drug; lamotrigine, and a non-steroidal anti-inflammatory drug; tenoxicam, are examined against marketed anti-Parkinson's in their conventional tablet form and intravenously administered form of Tween-coated pegylated lipid/polymer hybrid nanospheres (HNPs), for their brain targeting and pharmacodynamic efficiency. Single-step nanoprecipitation method was used in preparation; with varying inter-components ratios, with optimization standards set at particle size <200nm and entrapment efficiency >75%. Characterization, in-vitroand in-vivo pharmacodynamic and pharmacokinetic studies of optimized HNPs revealed that Tween-coated HNPs had significantly higher in-vivo pharmacodynamic effect compared to the non-coated ones. This was revealed through the former's targeting efficiency and consequent faster onset of action. Controversially; the reverse was observed in-vitro; where drug release from the latter was faster. All formulations showed sustained effect, compared to conventional tablets, reaching a week for the best formulation. Increasing lipid ratio within HNPs slowed down drug release and prolonging its effect. Lamotrigine Tween coated HNPs showed maximum anti-Parkinson's effect followed by its tenoxicam analogue when compared to L-Dopa in its conventional and HNPs forms. Combining lamotrigine and tenoxicam HNPs had synergistic anti-Parkinson's effect compared to L-Dopa, with tolerable side effects; increasing patient compliance and treatment efficiency. Furthermore, a combined formulation can be administered once weekly instead of daily SINEMET® intake; which is combination of carbidopa and levodopa for treatment of Parkinson's disease.

PT-08

Formulation, Evaluation and Comparative Pharmacological Studies of Spironolactone and Progesterone Nanostructure Lipid Carrier Gel for Hirsutism

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The main aim of the present study was to develop and compare the performance of spironolactone (SP) and progesterone (PG) loaded nanostructured lipid carrier (NLCs) for the treatment of hirsutism via topical administration. SP-NLC and PG-NLC were prepared using cold homogenization technique. Four formulations were prepared and evaluated for their physicochemical characterization. Drug% entrapping efficiency and in-vitro permeation study were also investigated. Surface morphology of the prepared NLC was evaluated using transmission electron microscopy (TEM) analyses. FTIR analysis of the optimized SP and PG NLCs formulations was done. Results showed that the all prepared NLC formulations have a spherical shape, smooth surface with nano metric size range, entrapment efficiency > 75% and zeta potential (-31.4 to -36.5 mV). Based on particle size, entrapment efficiency and in-vitro permeation study, F1 and F3 -NLCs were selected as optimized formulations for spironolactone and progesterone, respectively. Finally, to investigate and compare the effectiveness of the optimized formulations, topical hydrogel was prepared. Pharmacological studies were carried on different animal groups. Using penetration enhancer, 5 groups each of 6 Wistar rats were used. Inflammatory, antioxidant, hormonal parameters, and histopathological examination were measured. Letrozole showed marked increase in LH, FSH, and Testosterone while, (GSH) serum level was decreased. Also (IL6), (TNF-alpha), and (MDA) level was significantly increased. Animal group treatment with F1 formulation showed significant decrease in damaging caused by letrozole in all parameters over than other tested groups. Results pose a strong argument that the developed SP-NLC can be explored as a promising carrier for safer and more efficient management of hirsutism by topical administration.

PT-09

Preparation of PEGylated Nanostructured Lipid Carriers of Olmesartan Medoxomil for Enhanced Transdermal Delivery: Optimization, Ex-Vivo Permeation and In-Vivo Evaluation

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The aim of this study was to formulate PEGylated nanostructured lipid carriers (NLC) containing olmesartan medoxomil (OLM), a sparingly water-soluble drug with limited oral bioavailability of 26% for transdermal delivery. NLC consisted of solid lipid (Compritol® and Tristearin®) and liquid lipid, PEG containing medium-chain triglycerides mixture, (Labrasol® and Labafil®), stabilized by Tween 80 or Sodium deoxycholate. NLC were processed by using hot melt emulsification combined with high-speed stirring and ultra-sonication. A 24 fullfactorial design using Design Expert® software was designed to distinguish the impact of formulation independent variables on entrapment efficiency percent (EE%) , particle size (PS), polydispersity index (PDI), zeta potential (ZP) and in-vitro drug release (Q6h). The optimized formula (NLC16) showed EE% of 41.600.26± %, PS of 374.5039.50± nm, PDI of 0.040.01±, ZP of -44.405.30± mV and 48.471.13%± Q6h. Ex-vivo permeation using both shed snake skin and rat skin demonstrated higher efficiency of the optimized NLC permeation in comparison with OLM suspension. Histopathological study confirmed the tolerability of the topically applied NLC. Further, pharmacodynamic study showed the superiority of NLC over market tablet (Angiosartan® 10 mg) for controlling hypertension up to 48h. Overall, the obtained results confirmed that NLC could be considered as a promising carrier for transdermal delivery of OLM.

PT-10

Lipid–Polymer Hybrid Nanoparticles Incorporated in Thermosensitive In Situ Gel for Intranasal Delivery of Terbutaline Sulphate

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Intranasal administration is a promising approach for rapid-onset delivery of medications and to circumvent their first-pass elimination when taken orally. The present study was designed to improve the nasal availability of terbutaline sulphate (TS) and to prolong its nasal residence time for the treatment of asthma. Chitosan/pectin nanoparticles (CS/PC) were successfully prepared by isotropic gelation method. Phospholipid (PL) coated TS-nanodispersions were prepared in order to combine the characteristics of both polymeric nanoparticles and liposomes. These nanodispersions were characterized in terms of particle size, zeta potential, entrapment efficiency and in vitro release. Consequently, the optimum PL-coated CS/PC TS- loaded nanodispersion was incorporated into optimized thermosensitive in situ gel which was prepared using Pluronic in addition to chitosan as a mucoadhesive polymer. Incorporation of PL-coated CS/PC TS- loaded nanodispersions into in situ gel bases sustained the release of TS, improved its nasal availability and prolonged its nasal residence time. The in-situ gel formulation showed greater permeation than aqueous solution of TS. Moreover, in situ gel showed higher percent reduction of tidal volume and peak expiratory flow in histamine treated rats when compared to its nanodispersion. Thus, PL-coated CS/PC TS-loaded nanodispersion incorporated in optimized in situ gel could be considered as a promising intranasal formulation for asthma management.

PT-11

Taste Masking for Itopride HCl by Solid Dispersion method to be delivered as ODT

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Taste masking of water soluble bitter tasting drug, Itopride HCl, to get palatable fast dispersible tablets is the objective of the study. There is a need for a taste masking technique that is simple, economical and can be performed for high dose water soluble drugs by applying simple formulation steps that can be integrated with formulation development of the final product. In the current work taste masking of Itopride HCl was studied by performing different solid dispersion techniques, namely solvent evaporation and hot-melt extrusion. The excipients used in both techniques were mannitol and Eudragit EPO with different drug: excipient ratios, 1:1, 1:3, 1:4, 1:6 and 1:10 and 1:1, 1:3, 1:5, 1:6 and 1:10 for drug: mannitol formulae and drug: Eudragit EPO formulae, respectively. In vivo taste masking testing was done on 6 healthy human volunteers and evaluated using a scale system. The results showed that by using solvent evaporation method, F5 (1:10, drug: mannitol) and F4 (1:6, drug: EPO) were the best formulae for their taste masking properties, and by using hot-melt extrusion promising results were found but still under evaluation.

PT-12

Preparation and Optimization of Hyaluronic Acid in Sustained Release Mucoadhesive Buccal Films

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Hyaluronic acid (HA) is a linear polymer of glucuronic acid N acetyl glucosamine disaccharide. It has tissue healing properties and used in treatment of oral ulcers. HA offers advantages over steroids in that it is safe for all patients including infants and pregnant women, in whom there may be reluctance to use steroids. The aim of this work is to develop a sustained release mucoadhesive buccal film containing HA as a novel delivery system aiming to overcome the drawbacks of the fast wash off of mouth rinses and gels used in treatment of oral ulcers. HA films are prepared by applying freeze and thaw cross linking technique. The prepared films were evaluated for their physicochemical properties including folding endurance, study of surface pH, thickness of film, mucoadhesion property of film, swelling index study and in vitro dissolution. A full factorial design was adopted to study the effect of three independent variables namely polymers type, polymer concentrations and number of freeze-thaw cycles on the selected dependent variables of mucoadhesion, the time required to release 50% of HA (T50%) and tensile strength. The work resulted in optimum formulae of sustained release mucoadhesive buccal films which are aimed to be effective, safe and stable when used in treatment of oral ulcers.

PT-13

Formulation and Evaluation of Oral Dispersible Tablets of Cloperastine HCl for Treatment of Cough Using Different Superdisintegrants

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The purpose of the study was to formulate oral dispersible tablets including (Cloperastine) 10mg/tablet, which acts as cough suppressant.Fast oral dispersible tablets disintegrate instantaneously in the mouth to be swallowed without the aid of water.Thus, the work aims to improve convenience of administration and patient compliance. Oral dispersible tablets were prepared by direct compression method after incorporating three different superdisintegrants. Twenty sevenformulations having superdisintegrant at different concentrations were prepared. Theeffect of superdisintegrant on angle of repose, Carr's index, hardness, friability, disintegration and invitro release have beenstudied.The best two formulations showed acceptable results for Carr's index showed good flow ability for the best two formulations 15.43 and 15.75.Major numbers of formulations showed acceptable results for angle of repose ranging from 27.49 to 30.62. Disintegration results ranged from 30 seconds to 38 seconds considered the most characteristic property of oral dispersible tablets resulting in a very rapid dispersion in themouth cavity. Invitro drug release for the best two formulations showed 88.12%, 89.66% of drug release at predetermined interval 15 minutes. Although Cloperastine is aninsoluble drug, the addition of Tween 80 to dissolution media helped to dissolve it.In conclusion, changing disintegrants ratio produced formulations having very rapid disintegration time with relative rapid dissolution release results of Cloperastine.

MICROBIOLOGY AND IMMUNOLOGY

MB-01

Impact of experimental Schistosoma mansoni on Hepatitis B Vaccination

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Vaccination is an important utility to control infectious diseases, but absent or weak responses to vaccines represent a problem. It has been proved that chronic helminth infection is one of the contributing causes for absent or weak response to some vaccines. The aim of the present work studied the effects of.Schistosoma mansoni infection on the efficacy of hepatitis B vaccine (HBV) in experimental mice. In the present study HBV vaccine 0.1 µg/g body weight was injected via dorsal subcutaneous injection, for three times/week for two weeks before and after S.mansoni infection. Reduction in worm burden was associated with reduce in ova count and changes in oogram pattern which were mainly due to praziquantel (PZQ) treatment.Subcutaneous injection of (HBV) vaccine before S. mansoni infection or at day 14 or 35 PI reduced the total worm burden by 3.1%, 18.8% and 40.6% respectively. While, administration of (HBV) vaccine combined with PZQ treatment significantly reduced the total worm burden, egg load in the intestine and the liver. Severely reduced granuloma diameter, and significantly elevated cytokines levels in the groups treated with PZQ alone or combined with (HBV) vaccine. Treatment of HBV started at day 35 PI combined with PZQ, showed the greatest reduction in granuloma diameter (65.4 %) and inflammatory cells. While treatment the infected mice with HBV pre-infection showed the lowest reduction in granuloma diameter reaching to 19.9 % when compared with their corresponding infected untreated groups. In the current study, mean values of liver concentration of malondialdehyde (MDA), glutathione (GSH) and nitric oxide (NO) were measured. There was no significant change in (GSH) and (MDA) concentrations in infected groups vaccinated with HBV alone, (P 0.05) compared with infected group. The concentrations of GSH and MDA in groups treated with PZQ alone or combined with HBV vaccine showed significant ameliorations in their levels compared to infected group. The hepatic nitric oxide concentration was very highly significant lowered (P< 0.001) when PZQ was administered alone or to vaccinated animals with HBV. Eradication of schistosomal worms is helpful to improve the effect of HBV vaccination. The current studies in mice suggest that pre-treatment with praziquantel (PZQ) prior to HBV vaccination improve the efficacy of HBV vaccination in schistosoma infected human.

MB-02

Virulence Characteristics of Carbapenem-Resistant Klebsiella pneumoniae Recovered from Hospitalized Egyptian Patients

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The increasing incidence of carbapenem-resistant K. pneumoniae (CRKP) as well as hypervirulent strains is considered a terrifying public health concern. The current study target is to gain further insight into virulence traits of CRKP isolates in Egypt. The study carried out using 43 clinical K. pneumoniae isolates. Antibiotic susceptibility testing, biofilm formation assay, molecular characterization of carbapenemase and virulence genes were tested for all isolates. In addition, genotypic relationship between CRKP isolates was identified using ERIC-PCR. Carbapenem resistance was exhibited among 58% (2543/) isolates. MIC values of Carbapenem resistance K. pneumonia (CRKP)ranged from 32 to 128 µg/ml.Biofilm assay revealed that21 isolates (49%)showed moderate biofilm formation and 11 isolates (25.5%) were strong biofilm producing. BlaNDM-1 was recognized in 20.9% (943/) of isolates; while, blaOXA-48 was observed in 18.5% (843/). Type 3 fimbria (mrkD) and entB were addressed among 72.1% and 62.8% of K. pneumoniae isolates respectively. The ybtS and iutA genes were detected among 44.2% and 37.2% of the isolates respectively. ERIC-PCR showed 23 genetic profiles among CRKP isolates. Type 3 fimbria (mrkD) was specified as the most prevalent gene among moderately and strongly forming biofilm. In addition, siderophores encoding genes especially enterobactin was significantly detected among the studied isolates. The current study, indicating the emergence of CRKP with increased virulence traits in Egypt. This alarming, report highlights the ongoing need for effective screening procedures and strict infection control measures.

MB-03

Evaluation of the Antiviral Effect of Some Drugs on Foot and Mouth Disease and Rift Valley Fever Viruses

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The present study investigated the efficacy of Ribavirin; Acyclovir and Bee venom as antiviral agents against Foot and Mouth Disease (FMD) and Rift Valley Fever (RVF) viruses which are two of most threaten diseases where they have public health hazard and bad economic impact. In vitro antiviral assays revealed that infected untreated BHK cell culture with FMDV or RVFV showed clear characteristic CPE while treated infected cells with Ribavirin inhibited both viruses CPE up to a concentration of 100mg/ml showing complete virus inhibition. Also, complete antiviral effect against 100TCID50 of FMDV and RVFV was obtained up to 31.25mg/ml of Acyclovir. Bee venom acted as antiviral agent against both of FMD and RVF viruses in infected BHK cells up to a concentration of 62.5µg/ml inhibiting their CPE. In vivo antiviral assays revealed that treatedexperimentally infected Guinea pigs with FMDV showed complete curing percentage of 80; 80 and 90% with five days of treatment with Ribavirin; Acyclovir and Bee venom respectively while all infected untreated GPs showed depression, reduced appetite, developed vesicular lesions on footpad, mouth and inoculated sites. Experimentally infected untreated mice with RVFV showed severe weight loss, obvious clinical neurologic signs, paralysis and mortality by the 8th day post infection while treated infected mice showed resistance to progress disease signs in percentage 70; 80 and 90% with the treatment with Ribavirin; Acyclovir and Bee venom respectively. So, it could be concluded that Ribavirin; Acyclovir and Bee venom can aid to control FMD and RVF diseases reducing their economic losses.

MB-04

Histopathological and Histochemical Effects of Nicotine on the Liver and Kidney of Adult Male Rats

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Nicotine is the more abundant alkaloid component contained in tobacco. Nicotine is metabolized primarily by the liver, and to a lesser extent, the kidney. The aim of this study is to investigate the histopathological and histochemical changes in liver and kidney tissues of rats exposed to the nicotine. This study has performed on thirty-three adult male albino rats. Animals were divided into three groups; group I were served as control rats and injected subcutaneously with 1ml of normal saline for 8 weeks, Group II rats that injected subcutaneously with (0.25 mg/kg/rat/day) nicotine for 8 weeks, and Group III rats that injected subcutaneously with (0.5 mg/kg/rat/day) nicotine for 8 weeks. At the end of the experimentation; the animals were sacrificed by ether anesthesia and routine histological procedures; liver and kidney tissues specimens were examined under a light microscope. Microscopic examination of liver specimens from rats injected subcutaneously with nicotine showed mononuclear cell infiltration and that some of the hepatocytes had a hyperchromatic nucleus and enlarged sinusoids as compared with control ones. Whereas kidney specimens showed some vacuolated tubular cells, dilatation of few tubules and the presence of intraluminal casts in some tubules. Injection with nicotine showed iron deposition inside the liver sinusoids seen as green bluish stain. In addition, scattered iron intracellular deposition appeared as scattered bluish dots in kidney.Subcutaneous injection of nicotine caused damage in liver and kidney tissues. As well as, iron deposition in liver sinusoids and intracellular of kidney as appeared as green bluish stain.

MB-05

Phenotypic Detection of Efflux Mechanism in Panaminoglycoside Resistant Acinetobacter baumannii from Egyptian Clinical Isolates

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Over the last several years, Acinetobacter has emerged as a leading cause of hospital-acquired infections. Aminoglycosides are frequently used in the treatment of invasive infections. Factors associated with the resistance to aminoglycosides include the reduction of drug uptake, modification of aminoglycosides, and aminoglycoside efflux. The aim of our study was to phenotypically detect the presence of efflux mechanism using carbonyl cyanide 3- chlorophenylhydrazone (CCCP) in aminoglycoside resistant Acinetobacter baumannii strains isolated from different hospital wards. In total, 57 A. baumannii isolates were collected from two Egyptian hospitals. The antimicrobial susceptibility pattern was determined. The activity of the efflux system was evaluated using CCCP. A

mong 57 A. baumannii isolates, most resistance was observed against tobramycin, amikacin, kanamycin, neomycin, and gentamicin. The minimum inhibitory concentrations (MIC) range of A. baumannii was between 2 and 1024 µg/mL based on the tested antibiotics. The phenotypic detection of efflux pumps displaying a reduction of at least two folds in the MICs of antibiotics after addition of the efflux pump inhibitor showed that 19.4% of the isolates became less resistant to kanamycin, 44% to tobramycin, and 46% to amikacin but lower rates were recorded against gentamicin (12.2%) and neomycin (9.4 %). Our study suggests that the efflux mechanism is getting widespread in clinical settings to play an important role in aminoglycoside resistance. Acinetobacter baumannii has the ability to gain resistance to different antibiotic classes through these active efflux pumps. Hence, the application of strict infection control measures together with novel approaches to eradicate those efflux transporters should be applied in hospital settings.

MB-06

Phenotypic Identification of Efflux pump-mediated Resistance in Uropathogenic Escherichia coli Clinical Isolates from Egypt by a simple method

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Urinary tract infections are the most commonly encountered infections in clinics and outpatient settings and are mainly caused by Uropathogenic Escherichia coli (UPEC). Multidrug-resistant bacteria (MDR) have become a major public health threat, worldwide. This study aimed to investigate the prevalence of the MDR phenotype among uropathogenic E. coli clinical isolates from Egypt, efflux pump-mediated resistance. A total of 175 uropathogenic E. coli clinical isolateswere collected from two Egyptian governorates. The isolates were identified by conventional culture methods and by the polymerase chain reaction (PCR) detection of uspA geneand classified to their corresponding phylogenetic group by multiplex PCR. Antimicrobial susceptibility testing was done using the Kirby-Bauer disk diffusion method. The contribution of efflux pump-mediated resistance was determined by the efflux pump inhibitor microplate-based assay using chlorpromazine. The phylogenetic analysis of the UPEC isolates revealed that most of the isolates belonged to groups B2 11364.57%) 175/) and D 3318.85%)175/). The MDR phenotype was detected in 15990.8%) 175/) of UPEC isolates; Efflux pump-mediated resistance was detected in 92% (161175/) of UPEC isolates, and 98.7% (157159/) of MDR isolates. We concludea highpredominance of MDR phenotype and biofilm formation uropathogenic E. coli in Egypt.The high incidence of efflux pump-mediated resistance necessitates the application of new treating strategies to inhibit efflux pumps.

CLINICAL PHARMACY AND PHARMACY PRACTICE

CL-01

Pharmacokinetic Interactions between Telmisartan and Paracetamol

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Telmisartanis is antihypertensive agent.All studies revealed that biotransformation of telmisartan consisted of phase II reaction yielding an acylglucuronide of the parent drug.Paracetamol is also metabolized via glucuronidation pathway via UGT1 gene family enzyme, meaning that predicted drug interactions could occur in the stage of metabolism.A two way cross over study was performed separated by two weeks washout period. Twelve healthy male volunteers were enrolled in the study and were randomly divided into two equal groups. On the morning, a blood sample was withdrawn from each volunteer as a blank for the assay. Treatment I: Volunteers received one tablet of telmisartan alone (40 mg). Treatment II: Volunteers received two paracetamol tablets (mg) every 12 hours on the day before study. At the day of the study, volunteers received two tablets of paracetamol (1000 mg) and one tablet of telmisartan (40 mg) concomitantly. The pharmacokinetic parameters for telmisartan were calculated using WinNonlin programme (version 2 pharmacokinetic software). It was found that after treatment II a significant increase in Cmax, , t12/, and mean residence time, whereas, significant decrease in ke and Cl/F was observed with regard to treatment I. No significant changes were observed concerning tmax and Vd./F. The study indicated that paracetamol significantly increased the extent of absorption and decreased the rate of elimination of telmisartan. This was explained by the competitive inhibition between the two drugs for pre-systemic and systemic metabolism of telmisartan. This interaction could accelerate end organ damage resulting from hypertension.

CL-02

Effect of Automated Medication Errors Reporting System on Provision of Health Care

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Usingthe Medication Error Management Operating system (MEMOS) can result in enhancement of healthcare provision in the hospitals of Specialized Medical Centers (SMC). This enhancement was grant for the fact that automation aided in deeper and more condensed integration between the central SMC department and the affiliated hospitals. The aim of the study to evaluate converting from paper-based medication error reporting system to an automated one and the improvement of using MEMOS amongst 22 participating hospitals of the Specialized Medical Centers (SMC). A survey was developed using google forms and uploaded on the SMC website for the sake of being filled by all the reporters who are authorized to use the MEMOS to collect their opinions on several aspects regarding MEMOS use.From all reporters, 93% was responded, 75% of them submitted the questionnaires in favor of using MEMOS over the paper-based reporting system, 15% submitted that they prefer the paper- based system, and 10% submitted they are not sure. MEMOS can be considered as a useful tool for saving time and effort consumed during data retrieval and analysis, also in preventing attrition of samples due to lost paper error reports and eliminating the lag time between error reporting in hospitals and receiving the reports for analysis centrally in SMC. Using MEMOS can speed up the decision of taking corrective actions included development and implementation of new medication error preventive strategies or modification of old ones Which can result in better healthcare provision in SMC hospitals.

CL-03

Development and Clinical Evaluation of Topical Hydroquinone Niosomal Gel Formulation for the Treatment of Melasma

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Melasma is a common acquired bilateral symmetrical hypermelanosis. It involves sun-exposed areas of the skin, most commonly the face and arms. The aim of this work is to formulate and evaluate niosomes as carriers for the topical delivery of Hydroquinone and to improve the depigmentation effect of hydroquinone through niosomal encapsulation with objectives of prolonging its action and avoiding its most side effects.The niosomal gel of hydroquinone was prepared using cholesterol: span80: tween80 in molar ratio 150:75:75 and then incorporated in carbopol 934 as gelling agent. The formula then evaluated for drug content, drug release and stability. The prepared niosomal gel formula was studied clinically on well diagnosed patients of melasma and the results were compared with the commercial product (Clearique 2%)Delta Pharma Company. There was a highly significant difference between the studied groups (group I, patients who applied niosomal gel formulation and group II who applied Clearique 2% ® delta pharma) regarding to modified melasma area and severity index after treatment, clinical efficacy of the therapy, duration of improvement, side effects, and the recurrence of melasma. The current work was succeeded to prove that the incorporation of hydroquinone in niosomal gel improves its therapeutic effect regarding duration of improvement, clinical efficacy and nearly absence of side effects.Niosomal gel of hydroquinone also had a better patient compliance than Clearique 2% ® delta pharma since the second one cause erythema, and severe burn sensation at the site of application

CL-04

Atorvastatin and Myocardial Performance in Chronic Heart Failure Patients

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Statins used routinely in patients with coronary artery disease. The rapidity and effectiveness with which statins decrease coronary events has led to the hypothesis that statins might influence vascular biology and may bring about clinical benefits in chronic heart failure (CHF) through mechanisms beyond cholesterol reduction. The aim of the study was to evaluate the pleiotropic effects of atorvastatin on patients with CHF. Forty-eight patients with CHF were divided randomly into two equal groups; Atorvastatin group (received conventional therapy of HF plus atorvastatin 20 mg/d orally) and Control group (received conventional therapy only) for 3 months. Patients were examined both before and after treatment for; TNFα, ox-LDL, noradrenaline, BNP-32 and Troponin-I. Conventional Echocardiography including EF, E/A ratio, and tissue Doppler imaging (TDI) including Isovolumic contraction (IC), systolic velocity(S-peak), early (E) and late (A) diastolic peak velocities and Tei index were performed.

Atorvastatin group showed statistically significant decreased in TNFα, ox-LDL, BNP-32 and noradrenaline compared to their baseline values. Conventional echo failed to detect significant changes in each group except for significant increase in E/A ratio in atorvastatin group. DTI demonstrated that atorvastatin group showed significant improvement in systolic function [significant increase in S wave & IC peak velocities and better diastolic function [E peak velocity increased & E/E' ratio decreased significantly]. Tei index and heart rate improved significantly in atorvastatin group. Atorvastatin improved cardiac function, decreased inflammatory, oxidative stressparameters and modulated neurohormonal imbalance in CHF patients.

CL-05

Obesity among Type 2 Diabetes Mellitus: Association With Age, Gender, Duration of Diabetes and Glycaemic Control

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Obesity is an independent risk factor for cardiovascular disease. The present study was to determine the prevalence of obesity among type 2 diabetes mellitus outpatients in a tertiary center hospital and relationship between obesity andage, gender, duration of diabetes and glycaemic control. Atotal of 1077 type 2 diabetes mellitus patients were included in this study who attended at diabetes clinic of Universiti Sains Malaysia (USM) teaching hospital. All these patients were prospectively followed from January to December 2008. Data collected included age, gender, height, weight, body mass index (BMI), duration of diabetes, blood glucose were estimated, descriptive analysis to determine the prevalence of obesity. Chi-square test was used to analyze the association of obesity with independent variables like age, gender, duration of diabetes and glycaemic control. The present study recruited 1077 Type 2 DM patients aged 18 to 88 years. and mean duration of type 2 diabetes mellitus was 11 ± 6.8 years, and mean BMI was 26.94.7±. According to Asian Pacific Type 2 DM Policy Group (2005), among all diabetic patients only 18.5% had target body mass index (<23 kg/m2) and 81.5% had non-target of BMI (≤ 23 kg/m2). The analysis indicated that obesity was positively associated with age of patients (P<0.001), gender (P=0.004), duration of diabetes (P=0.001), and there is not associated with glycaemic control (P=0.183). The prevalence of obesity was very high in the present study. Prevalence of obesity increases with age, gender, duration of diabetes.

CL-06

The Potential Hazardous Effect of Exposure to Iron Dust in Egyptian Smoking and Nonsmoking Welders

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Exposure to iron dust and welding fumes is widespread and may increase the risk of lung inflammation. The aim of this study was to identify associations between exposure to iron/ welding fumes and the levels of inflammatory parameters and allergic mediators among 120 Egyptian men. Forty nonsmoking and 40 smoking Egyptian welders as well as 40 healthy volunteers who were never exposed to welding fumes and were nonsmoking were enrolled in the study. Peak expiratory flow rates (PEFR) assessed at the shift of work on working days revealed an impairment in lung function, with the smoking workers showing the worse results, followed by nonsmoking workers, as compared to healthy volunteers. Moreover, the results of the present study showed a significant increase in serum iron and immunoglobulin E, as well as plasma thiobarbaturic acid reactive substances, C-reactive protein, tumor necrosis factor-alpha, haptoglobin, interleukin-2, interleukin-6 and interleukin-23 histamine, lactate dehydrogenase isoenzyme-3, and calcitonin. In addition, the results revealed significant decrease in plasma a-1-antitrypsin and serum transferrin, as well as blood activities of antioxidant enzymes: catalase, superoxide dismutase, glutathione peroxidase, and glutathione reductase (as compared with control group). However, there was a nonsignificant change in arginase and a-L fucosidase in smoking and nonsmoking welders exposed to iron dust and welding fumes. In conclusion, occupational exposure to iron dust and welding fumes increases lung inflammation risk among Egyptian blacksmith workers, a condition that worsens with smoking.

PHARMACEUTICAL ORGANIC CHEMISTRY

OC-01

Synthesis and Antitumor Activity of Some Acyclic Nucleosides Attached to 10H-Phenothiazine

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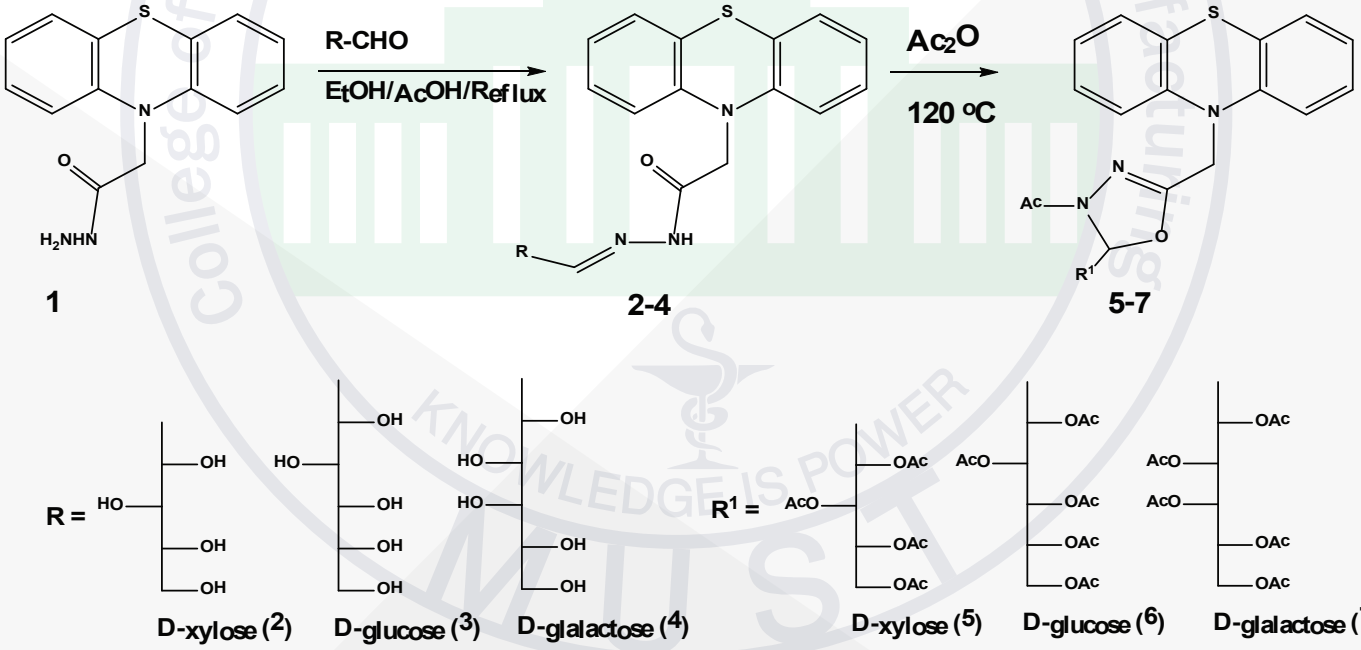
Phenothiazines were synthesized in 1883 and have been used as anthelmintic agents for many years. The phenothiazine as a class and especially chlorpromazine are most widely used as neuroleptics. Phenothiazine and related compounds have been reported to possess various biological activities. As a part of an ongoing research program devoted to the finding of new structural leads with potential chemotherapeutic activities, particular attention has been given to the pronounced anticancer activity. In the present investigation certain new acyclic nucleosides attached to 10H-Phenothiazine are synthesized and evaluated for their possible anticancer activities.The hydrazide derivative 1 was condensed with the appropriate monosaccharide [D-(+)-Xylose, D-(+)-Glucose, D-(+)-Galactose] in the presence of a catalytic amount of glacial acetic acid to afford the corresponding sugar hydrazones 24- in 7583%- yields. The oxadiazoline derivatives 57- were prepared in 7378%- yields by heating the sugar hydrazones 24- with acetic anhydride. Most of the synthesized compounds were found to possess the highly significant effect against breast cancer cell line (MCF7).



OC-02

Synthesis and Bioactivity Evaluation of New Pyrimidinone-5-carbonitriles as Potential Anticancer and Antimicrobial Agents

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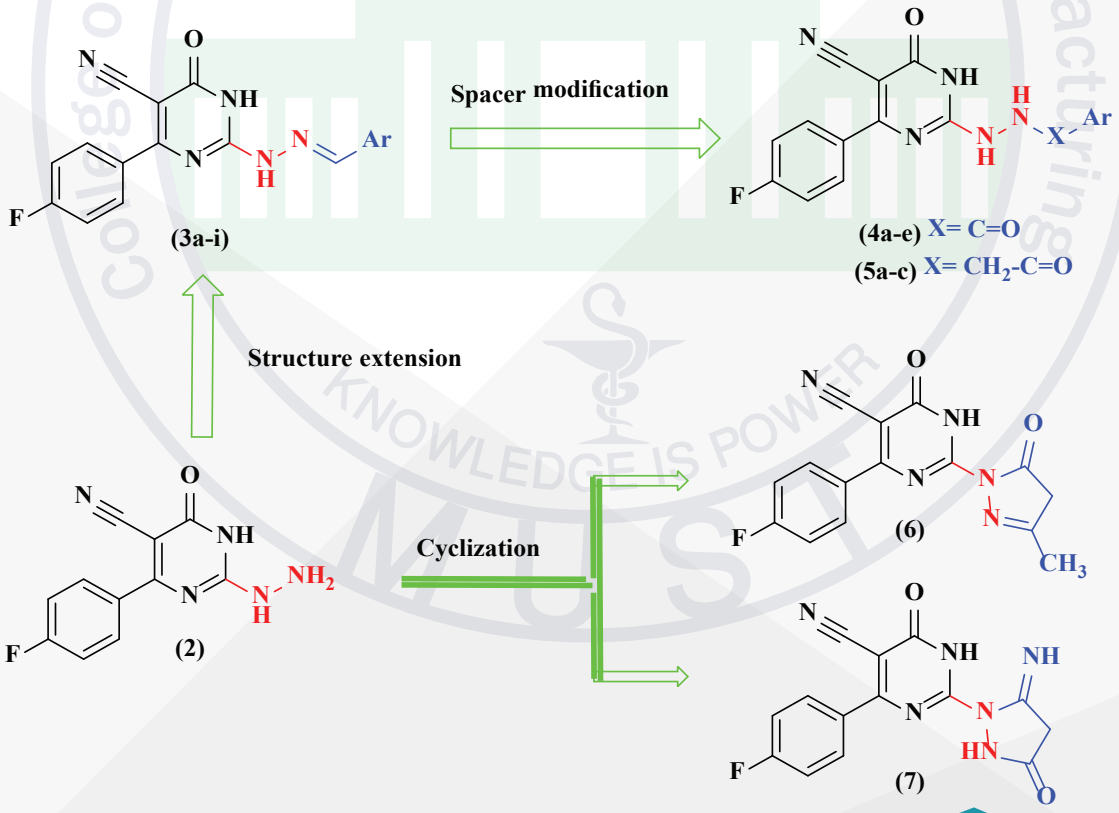
New series of pyrimidinone-5-carbonitriles3a-i, 4a-e, 5a-c, 6 and 7have been synthesized and explored for their activities as anticancer, antibacterial and antifungal agents. Investigation of the anticancer activity revealed that several newly synthesized derivatives displayed potent cytotoxic activity against different cancer cells. Among them, compound 3g was the most potent on the MCF-7, A549 and Caco-2 cell lines (IC50 =1.42, 1.98 and 9.50 µM, respectively), as compared with 5-fluorouracil (IC50 = 1.71, 10.32, 20.22 µM,respectively) while, compound 3f was found especially effective against MCF-7 and Caco-2 cell lines (IC50 =1.48 and 16.15µM, respectively). Furthermore, the antimicrobial evaluation showed that compounds 3f and 3g have potent antibacterial activity against Gram positive bacteria Staphylococcus aureus (MIC = 4 and 8µg/mL, respectively) and promising activity against Escherichia coli (I.Z =19 and 17 mm, respectively). Meanwhile, compound 4b displayed the highest activity toward Bacillus subtilis (MIC = 8µg/mL). In particular, the results suggested that hydrazone derivatives bearing heterocyclic ring 3f and 3g are good lead compounds for the future design of more potent anticancer or antimicrobial agents.



OC-03

Synthesis and Biological Evaluation of Some Novel Pyrazoline Derivatives as Anti-Inflammatory and Analgesic Agents

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Novel 1,3-diarylpyrazole chalcone and pyrazoline derivatives analogue to anti-inflammtory drug lonazolac were synthesized. Floctafenine marketed as Idrac® as a potent anti-inflammatory drug bearing a quinoline ring was used in the synthesis of novel chalcone and pyrazoline derivatives. The compounds were evaluated for their anti-inflammatory and analgesic activities. A mixture of Vilsmeier complexand phenylhydrazone 3 was heated to afford pyrazole aldehyde 4. Floctafenine 7 was treated with potassium periodate to give aldehyde derivative 8. The desired chalcones 5 and 9 weresynthesized via Claisen-Schmidt condensation of aldehydes 4 or8 with 2-chloroacetophenone in presence of potassium hydroxide.The target pyrazolines 6 and 10 were synthesized via the reaction of the corresponding chalcones 5 or 9 with 99% hydrazine hydrate in absolute ethanol under reflux. The novel compounds 5, 6, 9 and 10 were evaluated for their anti-inflammatory (rat paw oedema test) and analgesic activities (writhing test) and results were compared to reference drug Indomethacin. The integrity of the structures was substantiated by microanalyses, IR, 1H-NMR, and MS. Pyrazoline derivatives bearing either 1,3-diarylpyrazole 6 or quinoline 10 showed more inhibition of oedema (21.43%,28.57%; respectively) than chalcone derivatives 5 and 9 (9.52%,4.76%; respectively) in comparable to Indomethacin 30.95%. Folctafenine chalcone 9 and pyrazoline 10 exhibited more inhibition of writhing movements (90.0%, 84.5%, respectively) than pyrazole chalcone 5 and pyrazoline 6 (74.0%,75.9%; respectively) when compared to Indomethacin 94.8%. Pyrazoline derivatives bearing either pyrazole or quinoline moieties are interesting scaffolds for the development of novel anti-inflammatory and analgesic agents.