2nd International Conference

International Conference of Pharmaceutical Sciences

Future Perspectives on Drug Research and Sustainable Development

College of Pharmaceutical Sciences and Drug Manufacturing
A college accredited by "NAQAAE"

2nd ICPS
THE SECOND INTERNATIONAL CONFERENCE OF PHARMACEUTICAL SCIENCES
MISR UNIVERSITY FOR SCIENCE & TECHNOLOGY
2023

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

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JULY 11th - 12th
2023

The 2nd International Conference of Pharmaceutical Sciences

Misr University for Science and Technology

"Future Perspectives on Drug Research and Sustainable Development"

Conference Book

July 11th-12th 2023

MUST Campus

(MUST Opera House)

6th of October, Egypt

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In Honour and 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 honoured to hold its international conference in her memory.

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Prof. Dr. Rehab Abdelmonem

Rehab Ahmed Abd El-Monem is a Professor of Pharmaceutics & Industrial Pharmacy, head of the Industrial Pharmacy Department, Vice Dean for Community Service and Environmental Development, and Dean of the College of Pharmaceutical Sciences and Drug Manufacturing at Misr University for Science and Technology (MUST) in Giza, Egypt.

She earned a bachelor's degree in Pharmaceutical Sciences from the College of Pharmaceutical Sciences and Drug Manufacturing at MUST in 2005. She obtained her Ph.D. in Pharmaceutics and Industrial Pharmacy from the Faculty of Pharmacy at Cairo University in collaboration with the Thomas J. Long School of Pharmacy and Health Sciences, Department of Pharmaceutics and Medicinal Chemistry at the University of the Pacific, Stockton, California, USA, in 2013.

Her current research interests include industrial pharmacy, conventional dosage forms, formulation development and characterization, polymer-based drug delivery, nanotechnology, novel routes and modes of delivery, responsive delivery systems, and development and characterization of targeted drug delivery systems. She is also a reviewer for many international journals and a member of AAPS. In addition, she has teaching experience since 2005 and professional experience as a supervisor of researchers and postgraduate students in various fields of pharmaceutics, biotechnology, dentistry, and industrial pharmacy. Furthermore, she serves as a consultant in the Research and Development (R&D) departments of several pharmaceutical and food companies.

It is worth mentioning that she has held several positions, including Vice Head of the Quality Assurance Unit at the College of Pharmaceutical Sciences and Drug Manufacturing, MUST, in 2014. Moreover, she was an executive manager in ICPS MUST, 2018 with several contributions by attending, submitting posters, and organizing many international conferences. She chaired the Organizing Committee at the International Scientific Conference of Pharmaceutical Sciences-ICPS-MUST in October 2018. She was also the Dean's Assistant of the College of Pharmaceutical Sciences and Drug Manufacturing at MUST University in 2019.

Currently, she is a member and Coordinator of the Student Exchange Centre, a member of the medical sector of MUST, a Pioneer of EPSF-MUST, SEF MUST chairman, Member of the Examination Committee-MUST, Member of the Strategic Planning Committee, head of the Industrial Pharmacy Department, Vice Dean for Community Service and Environmental Development, and Dean of the College of Pharmaceutical Sciences and Drug Manufacturing at Misr University for Science and Technology-Cairo, Egypt.

Conference Co-Chair, Vice-Dean, College of Pharmaceutical Sciences and Drug Manufacturing
Prof. Dr. Maha Eissa

Professor Maha Ali Eissa Ahmed is an accomplished academician and researcher who has made significant contributions to the field of pharmacology and toxicology. She currently serves as the Vice Dean for Postgraduate Studies and Research Affairs at the College of Pharmaceutical Sciences and Drug Manufacturing, MUST. Additionally, she is a full professor of Pharmacology and Toxicology at the same institution.

Professor Maha Ali Eissa Ahmed's academic journey started at the Faculty of Pharmacy, Cairo University, where she received her bachelor's degree in pharmaceutical sciences. She then pursued her MS.C. and Ph.D. in the same field with a specialization in pharmacology and toxicology. Her postdoctoral studies mainly focused on neurobehavioral toxicities, ischemia, inflammation, and apoptosis.

Professor Maha Ali Eissa Ahmed's research work has been published in many internationally recognized journals, and she has also supervised several MS.C. and Ph.D. theses. She has been appreciated for her excellent work and received many awards. Her expertise in pharmacology and toxicology is also recognized by the international community, and she has been invited to participate in many conferences as an oral speaker or poster presenter.

Professor Maha Ali Eissa Ahmed is also a member of many professional societies and communities. She is the founder of the Research Ethics Committee and the Field Training Program at the College of Pharmaceutical Sciences and Drug Manufacturing, MUST. In addition, she is a reviewer for many highly ranked international journals in the field of pharmacology and toxicology, such as Toxicology and Applied Pharmacology, Toxicology Letters, and Neurochemical Research.

Professor Maha Ali Eissa Ahmed's commitment to personal and professional development is also reflected in the various training courses and workshops she has completed. She has received training in different disciplines such as toxicogenetics, molecular biology, quality assurance, human development, and teaching skills.

Professor Ahmed's contributions to the field of pharmacology and toxicology have been widely recognized, and she has received many appreciation awards for her excellence and effective contribution to the scientific and research field. Her nomination as one of the 2% most influential Top Scientists in the Stanford ranking 2022 is a testament to her outstanding contributions to the field.

Conference Secretary General, Head of Biochemistry Department

Dr. Hoda Shamloula

Dr. Hoda K. Shamloula Head of Biochemistry Department, College of Pharmaceutical Sciences and Drug Manufacturing, MUST, Egypt.

Dr. Hoda Shamloula is a lecturer work as the head of biochemistry department in College of Pharmaceutical Sciences and Drug Manufacturing, MUST. She has a Bachelor of Science (B.Sc.) and Master of Science (M.SC.) from Tanta University. Also was awarded a master and Doctor of Philosophy (Ph.D.), (1996) from The City University of New York (CUNY) in USA. Areas of special interest include biochemistry, molecular biology, and gene expression. Teaching experience since 1981 to 1988 as a demonstrator in Tanta university then as a teacher assistance and graduate teaching fellow in The City College of New York, USA and Brooklyn College, USA. She worked as a lecturer in Tanta university since 1996 to 2004, then in MUST faculty of pharmacy since 2004 to the present. She has a broad teaching experience as she is involved in teaching several courses such as cell biology, histology, histochemistry, genetics, biochemistry, molecular biology and biochemical engineering. Dr. Hoda has professional experience as a researcher and graduate students' supervisor in the area of cell fate determination, effect of medicine and therapeutic manipulation of gene expression research. Her publications were edited in several national and international journals such as Delta Journal of Science, Egyptian Dental Journal, J. Egypt. Soc. Parasitol., Life Sciences, J. Neurogenetics, Genetics, J. Neurobiology. Dr. Hoda presentations and abstracts were demonstrated in Cold Spring Harbor Laboratory, New York, USA (1993 & 1995), the 35th Annual Drosophila research conference, Chicago, USA (1994), the 5th "European Symposium on Drosophila Neurobiology" Montpellier, France (1994), an oral presentation in the 21st Annual East Coast Nerve Net International meeting, ECNN, MA., USA (1995), and the Third International Conference on Biological Sciences, Egypt. I.C.B.S. (2004). She has occupied position as an executive committee member of the Ph.D. Program of Biology in CUNY, USA from 1993 to 1996, organiser in community services organization in MUST (2016 to present) and head of Biochemistry department in college of Pharmaceutical Science and Drug Manufacturing in MUST (2014 to present).

Executive Director Assistant of Conference, Lecturer in the industrial pharmacy department,
Dr. Inas Essam Ibrahim Al Samadi

Inas Al Samadi is a lecturer of the industrial pharmacy department of the College of Pharmaceutical Sciences and Drug Manufacturing at Misr University for Science and Technology (MUST) -Cairo, Egypt.

She graduated and earned a bachelor's degree (B.Sc.) in Pharmaceutical Sciences, from the College of pharmaceutical sciences and drug manufacturing, MUST, 2007. She was awarded a Statistical Control and Quality Assurance Diploma, at Cairo University, in 2013. Lean Six Sigma and Statistical Research Diploma, at Ain Shams University, in 2016. She completed her master's degree (M.SC.), and Doctor of Philosophy (Ph.D.) In Pharmaceutics, and Industrial Pharmacy, Faculty of Pharmacy, Cairo University in 2019 and 2022 respectively.

Her current research interests include pharmaceutical and industrial pharmacy, Six Sigma implementation in the pharmaceutical industry, Biostatistics, and statistical analysis, conventional dosage forms, formulation development and characterization, controlled and novel drug delivery, biopharmaceutics, nanotechnology, and drug delivery. Additionally, novel routes and modes of delivery; development, and characterization of the targeted drug delivery systems.

She has experience in research and teaching, in different fields of pharmaceutics, and industrial pharmacy, where she has several publications in national and international journals. Furthermore, she has excellent experience in judging SEF-MUST research projects.

Besides, she has several contributions by attending, and posters submissions at many national and international conferences such as AAPS and Pharmaconex, she was on the organizing committee, at the First International Scientific Conference of Pharmaceutical Sciences-ICPS-MUST, in October 2018.

Currently, she is a manager of Planning and Scientific Affairs, and Supervisor of all international exams of Castle Worldwide Organization at CTC- MUST. Vice chairman of SEF-MUST, and a member of the scientific research judgmental committee of SEF-MUST. Head of the Characteristic Centre's Management Committee, a member of the COP-Webinar and Conference Committee, and lecturer of the industrial pharmacy department, at College of Pharmaceutical Sciences and Drug Manufacturing - Misr University for Science and Technology-Cairo, Egypt.

Executive Office Member of the Conference, Lecturer in the industrial pharmacy department,

Ass. Lec. Mina J. Azmy

Mina J. Azmy is an Assistant Lecturer of Industrial Pharmacy at Misr University for Science and Technology (MUST). He earned a bachelor's degree in Pharmaceutical Sciences from the College of Pharmaceutical Sciences and Drug Manufacturing in 2018 and completed his M.Sc. in Industrial Pharmacy at Cairo University's Faculty of Pharmacy in 2023.

Mina's research encompasses a wide range of pharmacy areas, including industrial pharmacy, formulation development, controlled drug delivery, biopharmaceutics, pharmacokinetics, molecular drug design, polymer-based drug delivery, nanotechnology, nanocarrier-based drug delivery, novel routes and modes of delivery, responsive delivery systems, and targeted drug delivery systems.

Committed to advancing the field, Mina actively contributes to academic and research endeavours at MUST. As an Assistant Lecturer, he shares his expertise with students, guiding them in understanding the core concepts of industrial pharmacy.

Additionally, Mina serves as an Executive Office Member of the Conference ICPS-2, where he contributes to organizing and facilitating the exchange of knowledge and research in the field of pharmaceutical sciences. He is also an Executive Office Member of the college dean, where he actively participates in administrative and decision-making processes to support the overall growth and development of the college.

Mina's aspirations revolve around pushing the boundaries of pharmacy and driving the development of innovative drug delivery and formulation technologies. His ultimate goal is to make a lasting impact on patient care and enhance the overall quality of life.

Executive Office Member of the Conference, Office Manager for the Quality Assurance Unit.

Ms. Doha Mostafa

Doha Mostafa is a highly skilled administrative professional with multiple roles at the College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology.

She serves as the Office Manager for the Quality Assurance Unit, Administrative Officer for Student Exchange, and is a member of the Dean's Executive Office.

Additionally, Doha takes on the position of Managing Director at the Pharmacology & Chemistry Research Centre within the university's Science Park and actively contributes to the Cultural Relations, Webinars, and Conferences Committee.

Top of Form Doha holds a bachelor's degree in business administration from the High Institute of Administration and Secretariat.

She has further enhanced her qualifications by completing an MSc degree in Total Quality Management from the Brooklyn Business School and acquiring a Mini MBA from Egycham and Ain Shams University. This educational foundation equips her with valuable management principles and effective communication strategies.

Doha's commitment to continuous learning is evident through her participation in various training programs and courses, including "Qualifying the Employees of the Administrative Sectors for Digital Transformation," "Strategic Planning," "Crisis Management and Negotiation," and "Technology for preparing women's leadership cadres."

She has earned certificates in team building, problem solving, radio fundamentals, and quality documentation of pharmaceutical products.

Doha's interest in public health is showcased by her completion of courses on COVID-19 infection prevention and control. Additionally, she has excelled as a presenter on Radio Pronto FM's program for children and lent her voice-over skills to the Kids in Islam YouTube Channel.

Doha's diverse educational background equips her with essential skills for her role in the Quality Assurance Unit of the College of Pharmaceutical Sciences and Drug Manufacturing, contributing to the college's commitment to continuous improvement in education.

Welcome Speech

Dear distinguished guests, esteemed speakers, and fellow colleagues in the field of pharmaceutical sciences and drug manufacturing,

It is my great honour, as the Dean of the College of Pharmaceutical Sciences and Drug Manufacturing at Misr University for Science and Technology, to welcome you to the Second International Conference of Pharmaceutical Sciences and Drug Manufacturing College.

Misr University is a leading institution in the field of pharmaceutical sciences and drug manufacturing in Egypt and the region. We are committed to fostering excellence in education, research, and innovation. This conference, with the theme "Future Perspectives on Drug Research and Sustainable Development," is a testament to that commitment. It brings together experts, researchers, and practitioners from around the world to discuss the challenges and opportunities facing the field of pharmaceutical sciences and drug manufacturing in the future.

I am pleased to announce that this conference will provide us with a unique opportunity to learn from and network with the brightest minds in the field.

The conference theme highlights the pressing need for sustainable drug research and development to meet the healthcare needs of a growing global population in the face of

limited resources. Through this event, we aim to facilitate dialogue, collaboration, and the exchange of ideas among international research networks.

Over the two days, we will have the privilege of hearing from distinguished keynote speakers, attending scientific sessions, participating in workshops, and engaging in poster presentations. We will explore a range of topics, including new drug discovery, drug formulation and delivery, drug manufacturing technologies, regulatory frameworks, and sustainability practices.

I encourage you to take full advantage of this unique opportunity to learn from and network with experts in the field. By working together, we can drive progress in drug research and development while promoting sustainable practices.

I would like to extend my sincere appreciation to the organizing committee, volunteers, staff, and all those who have contributed to making this conference possible. Your dedication and hard work are a testament to your commitment to excellence and the advancement of our field.

Once again, welcome to the Second International Conference of Pharmaceutical Sciences and Drug Manufacturing College at Misr University for Science and Technology. I wish you a productive and enjoyable conference and look forward to engaging with you throughout the event.

Thank you.

Prof. Rehab Abdel Monem
President of the Conference
Dean of College of Pharmaceutical Sciences and Drug Manufacturing
Misr University for Science and Technology

Book Content

Preface

Preface

Misr University for Science and Technology (MUST) is a major Egyptian comprehensive private University founded in 1996 by the Late Dr. Soad Kafafi. Located in 6th of October City, the university serves the entire country as a major educational institution.

Following Egypt's Vision 2030, The College of Pharmaceutical Sciences and Drug Manufacturing MUST focus on adopting policies and implementing strategic actions that achieve the United Nation's SDGs. We believe that education, research, and innovation play essential roles in helping society transition into sustainable communities. We are honoured to host the 2nd International Conference of Pharmaceutical Sciences (ICPS-2) Entitled "Future Perspectives on Drug Research and Sustainable Development" on July 11th and 12th, 2023, under the patronage of Mr. Khaled Altoukhy, Chancellor, MUST Board of Trustees, Prof. Dr. Ashraf Haider, MUST President, Prof. Dr. Rehab Abdelmoneim, Dean of the College of Pharmaceutical Sciences and Drug Manufacturing, and Prof. Maha Eissa, Vice Dean for Postgraduate Studies and Research Affairs. The conference will be held at MUST premises in the conference hall. 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

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, the College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology welcomes you to the 2nd International Conference of Pharmaceutical Sciences (ICPS-2) "Future Perspectives on Drug Research and Sustainable Development". The conference will focus on promoting new fields of research in pharmaceutical sciences, as well as future trends in a variety of areas. It will hopefully stimulate cooperation between business and academics. In addition, it will provide the chance to debate and exchange innovative perspectives and ideas. The conference aims to achieve a wide range of goals foremost of which is to provide a comprehensive definition of sustainable development, with a focus on achieving good health and well-being, waste management, quality education, and partnership for the goals of knowledge sharing and cooperation for access to science, technology, and innovation.

We are looking forward to your participation in this unique event, which emphasizes intergenerational continuity and interdisciplinary research.

Scope of the Conference

Scope of the Conference

1. Sustainable Development in Pharmacy practice
2. Use of artificial intelligence in pharmaceutical discoveries
3. Pharmacy and Medicine Optimization
4. Interprofessional Education and Integrated Learning
5. Research Innovations
6. Treatment Innovations
7. Pharmacoeconomics
8. Bio similarity and Bioequivalence

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Mohamed Magdy Sadek	Director of the College of Pharmacy Administration
Eman Osama Mohamed	Secretary of the Dean's Office

International Speakers and Online Sessions

Dr Marwa Mohanad is an academician and researcher who has made considerable contributions to the field of Biochemistry and Molecular Biology.

Currently holding the position of Associate Professor of Biochemistry at the College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology, she plays a pivotal role in advancing scientific knowledge and education in her field. Dr. Marwa Mohanad is actively involved in various aspects of academic administration and research coordination. As the quality coordinator for postgraduate programs, she ensures the maintenance and enhancement of academic standards for the university's postgraduate students. Additionally, she serves as the head of Cultural Relations, Webinars, and Conference Committee, overseeing the organization of cultural events, webinars, and conferences related to the development of the pharmaceutical field.

Dr. Marwa Mohanad began her academic journey at the Faculty of Pharmacy, Cairo University, where she earned her bachelor's degree in pharmaceutical sciences. She then pursued her MS.C. and Ph.D. in the same discipline, specializing in biochemistry and molecular biology.

During her postdoctoral research, Dr. Marwa Mohanad focused on understanding treatment response and evaluating various biomarkers, gene expressions, and proteins as prognostic, predictive, or diagnostic tools in different types of cancer, as well as inflammation, autophagy, and apoptosis. Her research findings have been published in renowned international journals. Currently, her research interests revolve around integrating bioinformatics and molecular modeling with her work on molecular biomarkers to gain deeper insights into the molecular mechanisms underlying cancer and treatment response.

In addition to her research pursuits, Dr. Marwa Mohanad actively participates in several professional societies and communities. She serves as a reviewer for esteemed international journals in the field of Biochemistry and Molecular Life Sciences. Her commitment to personal and professional development is evident through her completion of various training courses and workshops. She has received training in diverse disciplines such as bioinformatics, data sciences, pharmacogenomics, toxicogenetics, quality assurance, human development, and teaching skills.

Dr. Rana Gebreel is a Dr. Rana Gebreel is a renowned academician and researcher who has made substantial contributions to the field of Pharmaceutics.

Currently serving as a lecturer in the Pharmaceutics Department at the College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology, Dr. Gebreel has dedicated her career to advancing pharmaceutical sciences and enhancing treatment options for various diseases.

Dr. Rana Gebreel embarked on her academic journey at the prestigious Faculty of Pharmacy, Cairo University, where she earned her bachelor's degree in pharmaceutical sciences. Fueled by her passion for research and innovation, she continued her academic pursuits and obtained both her Master's and Ph.D. degrees in pharmaceutical sciences, specializing in the field of Pharmaceutics.

During her postdoctoral research, Dr. Gebreel focused her efforts on formulating and designing various types of nanoparticles. Her primary objective was to evaluate the efficacy of these nanoparticles in the treatment of numerous diseases using different dosage forms. Her groundbreaking research and findings have been published in esteemed international journals, solidifying her reputation as a leading expert in the field.

In addition to her research endeavors, Dr. Rana Gebreel is actively involved in professional development. She regularly participates in conferences, seminars, and workshops pertaining to her area of expertise. In addition, she consistently endeavors to increase her knowledge and keep on top of the most recent developments in pharmaceutical sciences by attending training courses and workshops across multiple disciplines. Dr. Rana Gebreel's remarkeable contributions to the field of Pharmaceutics, combined with her commitment to academic excellence and ongoing learning, have made her a prominent figure in the pharmaceutical community. Her research efforts and dedication to improving treatment options augur well for the future of pharmaceutical sciences and patient care.

Website Committee

Dr. Noha Ryad Mohamed is currently a lecturer of Pharmaceutical Organic Chemistry, College of Pharmaceutical Sciences and Drug Manufacturing, MUST university. She obtained her master's degree from Zagazig University, 2015 and earned her Ph.D. degree from Cairo University, in 2021. Her current research area is the area of substituted pyridine to synthesize novel molecules with cytotoxic activity.

Education: Ph.D. in Pharmaceutical Organic Chemistry Faculty of pharmacy Cairo University (2021). MSc. in Pharmaceutical Organic Chemistry Faculty of pharmacy Zagazig University (2015). B.Sc .of pharmacy. Misr University for science & technology (must), graduated student 2010 Honor list: 9th – must University.

Dr. Raghda Rabe Mohamed is a Lecturer in the industrial pharmacy department, College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology (MUST). She recently has the degree of PhD in pharmaceutics and industrial pharmacy. She received her Bachelor's degree from College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology, in 2009. She earned her Master's degree in 2015 and her PhD in 2020 from the faculty of pharmacy at Cairo University, Egypt. She worked from 2009 to 2010 at Dar Al-Foad Hospital, Cairo, Egypt as a unit pharmacist in the inpatient units. Then she joined the Department of industrial pharmacy, College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology (MUST) as a demonstrator from 2010 to 2015, as a teaching assistant from 2015-2020 and as a lecturer from 2020 to the recent time. Dr Raghda Rabe is the head of the safety measures committee and the electronic site committee, in addition to participating in many other committees that serve the College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology. She also contributed to the academic accreditation of the College in August 2019. She is the head of the website committee that organizes the second International Conference of Pharmaceutical Sciences, MUST, 2023. Her current research area is the application of nanotechnology in preparing different pharmaceutical drug delivery systems that improve the bioavailability of drugs and prolong their effect on the human body.

Media Committee

Ass. Lec. Mahmoud El-Tahan is an accomplished pharmacist and assistant lecturer in the department of industrial pharmacy. He completed his undergraduate degree in pharmacy from college of pharmaceutical sciences and drug manufacturing, Misr University for Science and Technology, one of the leading universities in Egypt, and went on to pursue his master's degree in the same field from Cairo university and now he is a PhD student.

Throughout his academic journey, Dr. El-Tahan has shown exceptional academic skills and a keen interest in the field of pharmaceutical sciences.

He has participated in various research projects, published several research papers, and presented his work in international conferences and seminars.

As a pharmacist, Dr. El-Tahan has extensive experience in the pharmaceutical industry. He has a deep understanding of the complexities of the industry, which has helped him to design and implement innovative solutions to various challenges.

In addition to his academic and professional achievements, Dr. El-Tahan is also an active member of the scientific community. He is currently serving as the media head committee for the Second International Conference of Pharmaceutical Sciences, where he is responsible for organizing and promoting the conference through various media channels.

Dr. El-Tahan is a dedicated and passionate individual who is committed to making a positive impact on the field of pharmaceutical sciences. His passion for research, combined with his industry experience and leadership skills, make him a valuable asset to the scientific community.

Abstracts & Posters Committee

Dr. Mennatullah Mohamed Abdellatif Associate Professor of Pharmaceutics and Industrial Pharmacy, College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology

Menna is an associate professor at the Department of Industrial Pharmacy, Misr University for Science and Technology. She has more than 17 years of research experience in various transdisciplinary aspects of pharmaceutics and industrial pharmacy research, focusing on nanotechnology-based drug delivery systems. Menna published about 20 papers in international journals that are indexed in Scopus and Web of Science. She also served as a reviewer for about 5 international scientific journals, leading her expertise to ensure the quality and accuracy of research published. In addition to her work as an associate professor and researcher, Menna has also been involved in various roles related to education. She holds the position of deputy head of the Industrial Pharmacy Department, head of the academic advising committee and coordinator in the quality assurance unit.

Dr. Walaa Hamada, PhD; is currently the Head of Quality Assurance Unit and Associate Professor of Pharmaceutical Chemistry and Drug design at College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology. She is the head of abstract and poster committee in the 2nd International Conference of Pharmaceutical Sciences (ICPS-2) "Future Perspective on Drug Research and Sustainable Development". She plays a vital role in developing scientific knowledge and education in her field. She is supervising many masters and doctoral dissertations. Dr. Walaa Hamada is a principal investigator for projects of the Science, Technology & Innovation Funding Authority (STDF). She serves as a reviewer in international journals in the field of Pharmaceutical Chemistry. Walaa started her academic journey at the College of Pharmaceutical Sciences and Drug Manufacturing where she got her bachelor's degree in Pharmaceutical Sciences. She then obtained her MS.C. and Ph.D. in the same field specializing in Pharmaceutical Sciences and Drug design. During her postdoctoral research, she focused on design, synthesis and biological evaluation of new anticonvulsant and anticancer agents and published many international papers in this field. Her Continuous concern for her personal, professional and administrative development is evident through completion of various training courses and workshops. Apart from that, she is also a certified international professional trainer.

Rofida Mohamed Saad is a Lecturer of Pharmaceutics in the College of Pharmaceutical Sciences Misr University for Science and Technology (Egypt).

Rofida has more than 15 publications (h index of 8) in reputable scientific journals, some of them in leading scientific journals, such as the International Journal of Pharmaceutics, International Journal of Nanomedicine, Drug Delivery, AAPS Pharm Sci Tech, and Marines Drugs., while she is a peer reviewer in International Journal of Nanomedicine and AAPS Pharm Sci Tech.

Apart from that, Rofida participated as a co-organizer of the International Conference of Pharmaceutical Sciences (ICPS I) Conference, and in several webinars related to various scientific fields.

Conference Book & Publications Committee

Dr. Nehad Eldydamony is currently an assistant professor of pharmaceutical chemistry, college of pharmaceutical sciences and drug manufacturing, Misr University for Science and Technology.

She received her bachelor's degree with honors from the college of pharmaceutical sciences and drug manufacturing, MUST in 2007. Demonstrator at pharmaceutical chemistry department, college of pharmaceutical sciences and drug manufacturing, MUST (2008-2013) then assistant lecturer (2013-2017). She obtained her master's degree from Al-Azhar University, 2013. Additionally, she earned her Ph.D. degree from Cairo University, in 2017. She contributed to the design and establishment of theoretical and practical courses in the pharmaceutical chemistry department. Her current research area is the design and synthesis of novel substituted heterocyclic compounds with different biological activities, where she has several publications in reputable international journals. She has also supervised Master and PhD students in their research. Furthermore, she is the college coordinator for sustainable development and the head of the conference book committee in the 2nd International Conference of Pharmaceutical Sciences (ICPS-2).

Dr. Lina Amin is a lecturer in pharmaceutical chemistry department, college of pharmaceutical sciences and drug manufacturing in Misr University for Science and Technology, she is an expert in organic synthesis of novel compounds and excels in drug design using different molecular modeling programs, she has extensive experience in teaching many topics in pharmaceutical chemistry field.

Education: 2018, A Doctor of philosophy (PhD), Pharmaceutical chemistry and drug design, Cairo University.

2013, master's degree (MSC), Pharmaceutical chemistry and drug design, Cairo University.

2008, Bachelor in pharmaceutical Sciences, college of pharmaceutical sciences and drug manufacturing, Misr University for Science and Technology (1st in class 2008).

2003, Graduated from Child home Language School.

Workshops Committee

Dr. Reem Abd Elhameed, PhD; is the head of the pharmaceutics department at the college of pharmaceutical sciences and drug manufacturing, Misr University for Science and Technology.

She obtained a PhD degree in Pharmaceutics from the Faculty of Pharmacy, Cairo University.

Her research focuses on designing, developing, and evaluating pharmaceutical formulas for various applications.

She is also a certified international professional trainer and the head of the training committee at the College of Pharmacy and Drug Manufacturing, Misr University for Science and Technology.

Logistics, Registration Desk, & Hospitality Committee

Mohamed Abd El Gawad is an Associate Professor and Head of the Department of Microbiology and Immunology at the Faculty of Pharmaceutical Sciences and Drug Manufacturing at Misr University for Science and Technology (MUST) in Cairo, Egypt. He was appointed to this position in September 2021, after having served as a lecturer in the same department since 2015. Prior to this, he had three years of research experience at the Faculty of Medicine-Aix-Marseille-University in Marseille, France (2013-2015). In 2018, he travelled to China to pursue two years of research experience at the Zhongshan School of Medicine, Sun Yat-sen University in Guangzhou. Mohamed holds a Master and PhD in Microbiology and Immunology from the Faculty of Pharmacy at Cairo University and a Bachelor of Pharmaceutical Sciences degree from the Faculty of Pharmacy at Misr University for Science and Technology (Excellent with honour). His research interests include bacteriology, epidemiology, bacterial resistance, molecular genetics, and gene mutations. He has been teaching various courses since 2006, including General Microbiology and Immunology, Parasitology, Pharmaceutical Microbiology, Medical Microbiology, Biotechnology, and Pathology. He has also supervised Master and PhD students in their research. His publications have been featured in several international journals of high impact factors, such as Emerging Infectious Diseases, mSphere, Antimicrobial Agents and Chemotherapy, Frontiers in Microbiology, International Journal of Nanomedicine, Bmc genomics, International Journal of Medical Microbiology, Emerging Microbes & Infections, Gut Pathogens, Foodborne Pathogens and Disease, Infection and Drug Resistance, Lancet Microbe and Microbiology Spectrum.

Ghada Ali Abdelkader is an Assistant Lecturer at Science Park Department.

She is a member of the executive office of the dean in college of pharmaceutical sciences and drug manufacturing.

Ghada is a member of community service and environmental development agency committee in college of pharmaceutical sciences and drug manufacturing.

Sponsorship Committee

Akram Hifny Abd El-Haleem, Ph.D., is currently the lecturer of Pharmaceutical Chemistry at the Pharmaceutical Chemistry Department, College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science and Technology. Additionally, he is the Manager of the Alumni Follow-Up Unit, the Manager of the Career Guidance and Continuing Education Committee, and the Vice Head of the Pharmaceutical Chemistry Department.

He graduated from the Faculty of Pharmacy, Cairo University in 1998. He worked as a Demonstrator at the Pharmaceutical Chemistry Department until 2012 and as an Assistant Lecturer at the same department until 2015.

Hifny was the Head of the Academic Advising Committee from 2015 until 2017.

He contributed to the design and establishment of practical courses in the Pharmaceutical Chemistry Department. He is a supervisor of master's and Ph.D. theses. His areas of research interest include designing, synthesizing, and studying the different biological activities of novel drug candidates.

Undergraduate Posters Committee

Dr. Doaa Hussien Hassan is a distinguished academic and researcher in the field of Pharmaceutics, currently serving as an Associate Professor at the College of Pharmaceutical Sciences & Drug Manufacturing at Misr University for Science & Technology.

Dr. Doaa holds a Ph.D. in Pharmaceutical Science from the Faculty of Pharmacy at Cairo University, which she earned in 2008. Prior to that, she obtained a diploma in Industrial Pharmacy in 2003 and a diploma in Quality Control and Quality Assurance in 2000 from the same institution. Her extensive education and training have laid the foundation for her exceptional research and academic achievements.

Dr. Doaa's research interests encompass a broad range of pharmaceutical topics. She has several research papers in these areas, which have been highly influential and have garnered widespread recognition and appreciation from her peers in the field. She has supervised several Ph.D. and master's students.

Aside from her impressive research accomplishments, Dr. Doaa has also held several leadership positions at the College of Pharmaceutical Sciences & Drug Manufacturing. She is currently serving as the Vice-Dean for Education & Students Affairs and previously served as the Head of the Pharmaceutics Department. Dr. Doaa was also the Director of the Quality Assurance unit.

Her contributions have been invaluable in maintaining the college's reputation for excellence in education and research, as exemplified by her role in organizing the NAQAAE on-site visit.

Overall, Dr. Doaa's academic and research contributions, combined with her exceptional leadership and organizational skills, have made her a highly respected and influential figure in the field of Pharmaceutics. She continues to inspire and motivate her colleagues and students at Misr University for Science & Technology's College of Pharmaceutical Sciences & Drug Manufacturing, setting the standard for excellence in education and research.

Ass. Prof. Samah Shabana is currently associate professor of Pharmacognosy and natural products chemistry at Misr University for Science and Technology (MUST).

She received her bachelor's degree from Faculty of pharmacy, Helwan University in 1999. She spent two years (2002-2004) as research student in Pharmacognosy Department, Faculty of Pharmacy, Helwan University, Ain Helwan, Helwan, Cairo, Egypt, till she gained her master's degree from the same university in 2004. From October 2004 she became Assistant Lecturer of Pharmacognosy; Faculty of Pharmacy, Misr University for Science and Technology. She received her Ph.D. degree from Graduate School of Life and Environmental Sciences, Osaka Prefecture University, Osaka, Japan in 2010. From 2012-2018 she spent six years as Asst. Professor of Pharmacognosy, Head of Pharmacognosy Department; Batterjee Medical College for Science and Technology. North Obhour, Jeddah, Saudi Arabia. She was one of the organization members of the international Conference of Pharmaceutical Sciences, MUST, 2018.Assoc. Prof. Dr. Samah Shabana, Ph.D., is currently Deputy director of Quality Assurance unit, Vice head of pharmacognosy department, Faculty of pharmaceutical sciences and drug manufacturing, Misr University for Science and Technology (MUST), 6 October, Egypt. She is responsible for establishing and applying undergraduate research as she is head of the student 's research committee. She is currently responsible for promoting steps to achieve international accreditation for the faculty of pharmaceutical sciences and drug manufacturing. Her current research area is the area of drug discovery from marine natural products, marine algae, animals, medicinal plants, and Mushrooms in addition to characterization of metabolomics using LCMS, GCMS and NMR. She is coauthor of several manuscripts dealing with this field. She is currently member in collaborative projects with Purdue and Montpellier University, France.

Keynote Speakers and Conference Topics

Day 1

PLENARY SESSION

Chairperson: Prof. Dr. Ismail Hamid

Education.
B. Pharm. Pharm. Chem (Honor); 1961, Dip. Drug Analysis Biol. Standardization; 1963, Dip. Chem. Pathology (honor); 1965, Ph.D. pharmacology (Honor); 1968.

Positions Held.
Demonstrator in pharmacology (1962-1968), Assistant professor in pharmacology (1968-1973), Associate professor in pharmacology (1973-1978), Professor in pharmacology at Colleges of pharmacy and medicine (1979-1993), Antivenom scientist (1993-1997), Professor in Pharmacology and Clinical pharmacy (1998-present), Dean, College of pharmacy, October 6 university (1999-2001), Vice president for graduate studies and research and chairman of their scientific committees, October 6 university (2001-2003), President and chairman of the scientific committees, October 6th university (2003-2006), Distinguished professor of clinical pharmacy and academic consultant to the board of trustees Misr university for science and technology (2006-Present).

Current position
Distinguished Professor of Clinical Pharmacy and Academic Consultant to board of Trustees Misr University for science and technology (2006-Present), Supervisor, Clinical pharmacy department, College of pharmacy, Ain shams university (2001-2006).

Scientific Membership Thirteen International Scientific Committees and Associations

Editorial board of 3 international journals and a reviewer at 10 international and national journals

Honors and Awards The Univ. of Alexandria Award for Scientific Excellency (1976); The Distinction Award of King's Saud University (1980); The Distinction Award of king Saud university (1984); Ministry of Health Research Grant to establish treatment of protocols (1987-1997); Elected member of the New York Academy of Sciences (1994); Elected member by the association of American publishers in the list of "The Most Admired Men and Women for the year 1994" (1994); Elected by the International Biographical Center, Cambridge, England as "One of the international leaders in Achievement for year 1995" (1995); Marquis who's who in the world 14th edition (1997); The Silver Medal for Professional Achievements In pharmacy 1998); Marquis who's who in the world 15th edition (1998); Marquis who's who in medicine (1998); Marquis who's who in science and engineering (1998); Elected representative of Africa, Middle East and India in the board of International Society and Toxicology (1998); The Silver Medal for Professional Achievement in Pharmacy (1998); The Gold Medal for Professional Achievement in Pharmacy (1999); Elected Member for the National Committee of pharmacology (2000); The Prize of the International Symposium on Travel

Medicine, Riyadh, Saudi Arabia (2001); Elected Professor of the Year in Clinical Pharmacy (2016/2018); Prize of the Egyptian Society of Pharmacology and the Therapeutics for Life Carrere Achievement (2019).

International committees

The Expert Working Group on Biological and Toxin Weapon Verification, USA (1990-1992); The Expert Working Group on Implementation of Proposal for Verification Protocol to biological weapons, USA (1991-1992); The Review Group for a Verification Protocol to the Chemical Weapon Convention, USA (1992-present); The Advisory Committee for the International Meeting on the treatment of Envenomation's (1994-1995); WHO Expert group on "Envenomation's and their treatment (Paris)", "Treatment Protocols For Scorpion Envenoming (EMRO)" and "Biological Standardization (Geneva)" (1994-present); Scientific Expert, Human Rights Watch Arms Project, USA (1995-present); Member, The Scientific Committee for the Arab pharmacopeia (1998-present).

National Committees.

Member, The National Committee for Pharmacology (2000-present); Member, The National Committee for Toxicology (2004-present); Member, The National Committee for Development of Higher Education (2004-present).

Scientific Publications:

About 75 publications on venom research, About 15 publications on the regulation of body temperature and miscellaneous 25 scientific publications.

Prof. Dr. Medhat Al-Ghobashy

Professor of Bioanalytical Chemistry, Faculty of Pharmacy, Cairo University.

Biography

Biography Dr Medhat Al-Ghobashy, Professor of Bioanalytical Chemistry, Faculty of Pharmacy, Cairo University. Currently, the Chairman advisor for Regulatory & Reference Labs at the Egyptian Drug Authority (EDA). Dr Al-Ghobashy has been a "Titular Member" of the Analytical Chemistry Division of the International Union of Pure & Applied Chemistry (IUPAC) for two years after serving as the "National Representative" of Egypt for two more years in the same division. Currently, Dr AlGhobashy is serving as the EDA representative in the supreme committee of the Egyptian Pharmacopoeia. Dr Al-Ghobashy is the leader of the Bioanalysis Research Group. He has a solid background in the field of bio similarity assessment, biomolecular characterization, and biocompatibility studies of medical devices. He is currently involved in several research projects covering the development and characterization of biotechnology-derived drugs intended for the treatment of multiple sclerosis and breast cancer. The expertise of the Bioanalysis Research Group in tandem mass spectrometry has been lately extended to the analysis of pharmaceuticals in biological fluids and undesirable compounds / related substances in pharmaceutical raw materials and finished products.

Title

Egyptian Drug Authority: An Overview

Dr. Carsten Walbiner

Director regional office Cairo, Deutscher Akademischer Austauscdienst (DAAD)

Biography

Carsten Walbiner, the director of the DAAD's regional office in Cairo since December 1st, 2022, holds a PhD in Oriental Studies from Leipzig University. Through years of service at the DAAD headquarters and other institutions in Germany, Lebanon, and Palestine, he has gained a great experience in the field of academic cooperation between European and Arab counterparts. Prior to his arrival in Cairo, he directed on behalf of the DAAD the HOPES(-LEB) project, an EU-funded initiative that aimed/aims to improve the situation of Syrian refugees of post-secondary age and young people in host communities affected by the high influx of Syrian refugees by addressing their higher education needs.

Title

The DAAD's programs and services in support of Egyptian universities and academics - a short overview.

Dr. Mohey Hafez

Chief Commissioner for Care Services and Pharmaceutical Industries of the Federation of Eastern Countries Africa – COMESA.

Biography

PROF. DR. Mohey Hafez is currently the Chairperson of Healthcare Services and Pharmaceuticals Industry at COMESA. He is also Head of Medicine and Health Committee & member of the executive office of the Egyptian Federation of Investors Associations (EFIA).
He held several leaderships positions:

- Member of Egyptian senators 2020.
- Board member & Head of the Pharmaceutical Industries sector at Federation of Egyptian Industries (FEI).
- Deputy Chairman of Egyptian Export Council for Medical Industries (ECMI).
- President of pharmaceutical industries & health committee at Tenth of Ramadan Investors Association (TRIA).
- Board member of the pharmaceutical education planning sector at the Supreme Council of Universities.
- Council member & Member of clinical trials and advanced pharmaceutical research, in the Faculty of Pharmacy at Ain Shams University and Cairo University.
- Lecturer of current Good Manufacturing Practices (cGMP), faculty of Pharmacy, Zagazig & Ain Shams Universities.
- Chairman Of National Centre for Technological Dual Education –Ministry of Education.
- Member of the Advisory Council for Technical Education - Ministry of Education.
- Founder and Vice Chairman of the board of trustees at 10th of Ramadan University.
- Vice Chairman of Tenth of Ramadan Investor Association (TRIA).
- Member of Investment & Tax Committees at Federation of Egyptian Industries (FEI).
- Member of Arab & African Cooperation Committees at Federation of Egyptian Industries (FEI).
- Vice President of the board of directors at Syndicate of Industrial Investors (SII).
- Deputy General assistant for the board of trustees of industry and trade at the supreme committee of Mostaqubal Watan party.

Title

Pharmaceutical harmonization through Arab Medicens Agency (WAAD) and Comesa Medicens Agency (CMA)

Prof. Dr. Nadia Zakhary

Former Minister of Seientihc research, Professor of Medical Biochemistry, National Cancer Institute (NCI), Cairo University.

Biography

Professor of Medical Biochemistry, National Cancer Institute (NCI), Cairo Univ.

B.Sc. (Biochemistry), faculty of Science, Ain Shams Univ. Excellent with degree of honour. M.Sc. and Ph.D. (Medical Biochemistry) faculty of Medicine, Cairo Univ. Former chair of the Cancer Biology department, NCI, Cairo University. Visiting Professor at New York University, Manhattan, U.S.A.

Former Minister of Scientific Research. Some of my memberships:

- The National Council for Women and other committees.
- The Board of Trustees and Scientific Research Committee of BUE and El-Mansaura El-Gadida Univ.
- New York Academy of Science.
- Different Ethical committees.
- Committee of Community Service and Development of NCI and Cairo Univ.
- International Science Council.
- Council of Policies of Learning and Sci. Res.at ASRT
- Institute d'Egypte
- Offered the "Cairo University encouraging prize", "Ideal Mother", "International scientific publication prize" and "The best stuff member of CU prize". Besides, many other awards are offered by different scientific, social, and cultural organizations.
- Ranked by FORBES (2013) as the first most influential women in the Egyptian government, having positive impact in leadership and the 16th among the Arab worlds.
- Ranked by SCOPUS among the best 909 scientists worldwide.
- Auditor and examiner for scientific programs, courses, thesis, and projects.
- Supervised about 60 M.Sc., Ph.D., and M.D., and published 70 scientific papers.
- Among the editorial board and reviewer for many National and International scientific journals and conferences.
- Teaching courses of biochemistry, proteomics and cancer biology in Egyptian universities and biotechnology course joined between Cairo University and Georgia Univ., U.S.A.
- Organized several exhibitions for innovations and prototypes concerned with crucial needs of society.
- Establishing International scientific collaborations with African and European countries, USA, Russia, and other countries.
- Increasing the budget for scientific research and salaries of researchers.

Title

The Role of Universities in Drug Sustainability

Dr. Naoko Fukami

Director, Japan Society for the Promotion of Science (JSPS) in Cairo

Biography

Naoko FUKAMI is Director, Japan Society for the Promotion of Science Promotion Society (JSPS) Cairo since 2015 and engaged in a project of Revitalization and Sustainability of Communities in Historic Cairo supported by TOYOTA Fund from 2016 to 2018, and Project for Sustainable Conservation in the Historic Cairo/Community Development with the Participation of Local Residents (phase 1 and 2) supported by the Agency for Cultural Affaires Japan 2021 to 2023; International Exchange Program for Cooperation in Cultural Heritage. She obtained her M.Sc from Tokyo Metropolitan University in 1981 Islamic Architecture in Deccan from the 14th to 17th century, and Ph. D from Yokohama National University in 1998 Muqarnas, its origin and development. She was a Visiting Professor Institute of Oriental Culture, University of Tokyo from 1999 to 2001making the Digital Archive: by the Mission for Indian History and Archaeology, University of Tokyo in 1959-1962. She was a Professor, Organization for Islamic Area Studies, Waseda University from 2011 to 2014, she joined the project of Islam and Multiculturalism. Her articles are 'Bhadreshwar, from the Medieval Port City to Modern Village, Gujarat, India', Islam and Multiculturalism" JSPS Core-to-Core Program, pp.62-74, 2016 and 'The Use of Muqarnas in the Transitional Zone of Domes in Egyptian Islamic Architecture: From the Fatimid to the End of the Mamluk Era', ORIENT, Volume 52, pp.93–120, 2017, Chapter 5 Regional Diversity and Sustainability of Megacities in Global Historical Perspective, Living in the Megacity: Towards Sustainable Urban Environments pp.67-101 2021. Her books (in Japanese) are the World of Islamic Architecture, Kodansha Genndai-Shinsho, 2005, Global history in Islamic Architecture, Iwanami Shoten, 2013, and Beautiful Mosques from the World, X-Knowledge, 2016 etc.

Title

JSPS (Japan Society for the Promotion of Science) and its International Programs

Abstract

The Japan Society for the Promotion of Science (JSPS), or Gakushin for short, is an independent administrative institution, established by way of a national law for the purpose of contributing to the advancement of science in all fields of the natural and social sciences and the humanities. In this presentation, I will focus on the international programs, 1) supporting international joint research and seminars, 2) providing platforms for international training opportunities for young researchers, 3) inviting

researchers to Japan, 4) sending young Japanese researchers overseas, 5) support globalization of universities. JSPS is Japan's core research-funding agency established in 1932 for the purpose of promoting science. As part of its mission to build strong networks for advancing international joint research, JSPS has established ten overseas offices in nine countries around the world. These offices serve as Japan's "Science Embassies" in their host countries and regions. As such, they promote and facilitate scientific exchange, disseminate information on scientific activities and developments in Japan, support Japanese researchers labouring abroad, and coordinate with JSPS alumni associations, among various other functions.

Mohamed El Koossy

Deputy Director, The United Nations Information (UNIC) Centre in Cairo, Egypt

Biography

Mohamed El Koossy is an accomplished communication professional with over 20 years of experience in integrated marketing communication, strategic media/public relations planning, and team leadership. With a strong background in developing and executing communication campaigns, creating public awareness programs, and fostering relationships with government, private sector, and non-governmental organizations, Mohamed is widely recognized for his expertise and results-driven approach.

As a responsible parent and advocate for Children's Rights, Mohamed founded an initiative called "We Make Dreams Come True", which grants the wishes of children with cancer, granting hundreds of dreams per year on an ongoing basis since 2006.

Mohamed's extensive experience in Africa dates back when he managed marketing and communication activities for British Airways in the North Africa region. His involvement with Tetra Pak further expanded his knowledge and expertise, as he successfully led communication and business development projects across Algeria, Sudan, Uganda, Kenya, and Egypt. Additionally, he holds the distinction of being one of the founding members of the Centre of Developing Communication in Tunisia, highlighting his commitment to advancing communication practices and knowledge sharing.

Currently serving as the Deputy Director at the United Nations Information Centre in Cairo, Egypt (UNIC), Mohamed continues to utilize his influential platform and expertise to promote social causes and create a positive impact in his community.

Title

Shaping the Future: Uniting for Health and Education in Sustainable Development

Day 1

SESSION 1: Sustainable Development in Pharmacy

Chairperson: Prof. Dr. Mohamed El Nabarawi

Biography:

Prof. Dr. Mohamed A El-Nabarawi

Chairperson and Head of Department of Pharmaceutics and Industrial Pharmacy, Faculty of Pharmacy, Cairo University.

Dr. Nabarawi earned his Bachelor of Pharmacy in 1984 excellent with honors, his master's degree in Pharmaceutics in 1989 and his Doctor of Philosophy in pharmaceutics in 1996 from Faculty of Pharmacy Cairo University. His Postdoctoral fellowship in 2008 from Thomas J Long School of Pharmacy and Health Sciences University of The Pacific, Stockton, California, USA. Dr Nabarawi was Ex-vice dean for Community Service and Environmental Development, faculty of Pharmacy, Cairo University. Dr. Nabarawi published 130 international research articles with an h-index of 23 and 39 local articles. Dr. Nabarawi supervised and granted awards for 45 PhD theses and 60 Master theses. Dr Nabarawi had five Egyptian patents. Now he supervised 24 Master theses and 19 PhD theses. Dr Nabarawi cooperates with University of Pacific from 2008 until now, also he cooperates with faculty of pharmacy, King Saud University, Jordan University for Science and Technology and Kuwait University. His research is interested in design, development, modification, and characterization of advanced drug delivery systems for oral, buccal, nasal, and Transdermal drug delivery systems. Nano-vesicles technology and solubility enhancement of different APIs.

Dr Nabarawi is the head of the committee of promotion degrees of Professors and Assistant Professors (Pharmaceutics), Supreme Council of Universities, Egypt.

Prof. Dr. Josep M Guiu

Director of Pharmacy at the Consortium of Health and Social Care of Catalonia, Barcelona, Spain

Biography

Dr. Josep M Guiu is currently Director of pharmacy at the Consortium of Health and Social Care of Catalonia, Barcelona, Spain. He was coordinator of the Drug access and health outcomes at the Catalan Health Service. Dr. Guiu received his licensure in Pharmacy from the University of Barcelona and completed his hospital pharmacy training at Vall d'Hebron University Hospital in Barcelona, obtaining his hospital pharmacy specialty from the Ministry of Health of Spain. Currently, he is adjunct lecturer of clinical pharmacy and pharmacotherapy at the Faculty of Pharmacy and Food Sciences of the University of Barcelona. Since 2018, he serves as Vice president for the Euro region of the Hospital Pharmacy Section of the International Pharmaceutical Federation (FIP). He is also secretary of the Catalan Society of Clinical Pharmacy and member of the scientific committee of the Farmacia Hospitalaria Journal.

Title

The contribution of hospital pharmacy to sustainability: a global perspective

Abstract

Hospital pharmacy have a leadership role in promoting sustainability in healthcare, particularly in light of the global push for a green deal and achieving the Sustainable Development Goals (SDGs). Hospital pharmacy can contribute to the achievement of the SDGs through its various functions, such as waste reduction, energy efficiency, and sustainable procurement. In terms of waste reduction, hospital pharmacies can develop strategies to minimize the amount of pharmaceutical waste generated by hospitals, thus contributing to the SDG 12 on responsible consumption and production.

Dr. Islam Anan

Founder and CEO of Accsight L.L.C.

Biography

Dr Islam Anan is the Founder and CEO of Accsight L.L.C. He is a Lecturer of Health Policy, Health Economics and Pharmacoepidemiology (Faculty of Pharmacy - Ain Shams University and MIU), and a Lecturer of Medical Journalism (The American University in Cairo). He is Health Policy and Health Economics Consultant – UNICEF and Health Policy and Health Economics Consultant to the presidential initiatives dept. at the Egyptian Ministry of Health and Population.

With 20 years in healthcare industry with academic and professional experience in healthcare and research consultancy located in different affiliates in the Middle East and emerging markets as well as western Europe, he is currently the founder and CEO of Accsight (Healthcare Integrated Solutions), the leading research consultancy agency with presence in 15 countries and more than 50 employees. Throughout his career he participated in 500+ research projects with many publications in the field of Health Economics, health policy, market research, PRO and Epidemiology. He got 10,000+ consulting and instructing hours to different entities (pharmaceutical companies, universities, healthcare public bodies and public) and consultant to many public sector bodies (governmental bodies in Egypt and Middle East countries like Egyptian MOH, UPA, and HIO), and pharmaceutical companies. He expert matter guest at the BBC channel, DMC, MBC, SKYNEWS and many others in the field of COVID-19 policies and economics, his forecast models of the COVID-19 waves were the base of many political decisions in the Middle East since December 2019 with 90+% accuracy.

He is a reviewer to many medical journals like VIH, editor at AIJPMS journal and (ISO 20252) auditor for Health Care Research.

Title

Effective polices for healthcare services sustainability.

Abstract

In light of the migration process from the old healthcare system in Egypt to a new one based on 2030 vision, new entities were formed in addition to the MOHP, as EDA, UPA, GAHAR, UHIA, and EHA. However.

During systems migration, Policies are needed to ensure patient reachability in faster access as well as the sustainability of healthcare services with no disruption. A new policy framework was published in 2022 called Access Reach Integration Framework (ARIF). It aims to bridge between (Access-entities) that facilitate the existence of health technologies (HT) and (Reach-entities) that make sure HT is correctly, timely and conveniently utilized by patients, thus ensuring system sustainability.

ARIF is based on; 1-setting a unified timeline and turn-around time (TAT) from the point of HT registration till utilization. 2-Unified digitization and coding system in the reach entities that can help the access entities take informed access decisions. 3- automation. 4- Hierarchal structure that enables a smooth workflow between access and reach entities. 5- unified patient-driven key performance indicators (KPIs) for all access and reach entities to make sure the patient is at the heart of the process. And finally, 6- efficiency to ensure the system is sustainable.

Prof. Dr. Anthony P Mchale

Professor of Medical Biotechnology, School of Pharmacy & Pharmaceutical Sciences, Ulster University, United Kingdom

Biography:

Prof. McHale was educated in Ireland where he received a B.Sc. degree (1978) and Ph.D. (1981) in Biochemistry from University College Galway which was part of the National University of Ireland at the time. He then accepted a post as postdoctoral fellow at Baylor College of Medicine, Houston, Tx., USA, and subsequently returned to Ireland to take up a post as lecturer at Trinity College Dublin in 1985. During his time at Trinity, he became interested in photodynamic therapy and continued to develop that interest following a move to Ulster University in 1992. During his career at Ulster, he progressed from lecturer, through reader and finally to full professor in 2000 and from then, his research interests developed to include stimulus responsive drug/gene delivery systems for applications in oncology and tissue regeneration. Since his research is highly applied in nature, he was interested in the translation of their research to the clinic, and this has led to his involvement as founder in several commercial spinouts. In addition to serving Ulster as Professor of Medical Biotechnology, Prof. McHale is a co-founder of StimOxyGen Ltd., a company aimed at commercializing a nanoparticle preparation that can generate oxygen in hypoxic tumours to enhance therapeutic outcomes. He currently serves this company as a director and advisor. Additionally, he is a co-founder of SonoTarg Ltd., a company aimed at commercializing microbubble formulations for site-specific, ultrasound-mediated co-delivery of chemotherapeutic and sonodynamic functions for the treatment of cancer. Prof. McHale serves this company as a director and as Chief Technical Officer.

Title

Nanoparticle mediated sonodynamic therapy for treatment of pancreatic cancer.

Abstract

Pancreatic cancer is one of the most recalcitrant forms of cancer and 5-year survival statistics are extremely poor. Treatment options primarily include chemotherapy, surgery, or combinations of both. Although conventional chemotherapy plays a significant role in treatment, introduction of novel emerging therapeutics has had little impact on survival statistics, primarily because they exhibit limited therapeutic efficacy, or resistance to these precise targeting agents occurs. Successful treatment of pancreatic

cancer is hindered by the observation that the tumour microenvironment is extremely desmoplastic, consisting of extensive and extremely dense fibrotic tissue or tumour stroma, through which nests of cancer cells are dispersed. Essentially, in addition to providing a growth support function to cancer cells, this dense tumour stroma also provides a protective effect against therapeutic drugs. It can also mediate immune suppression by either physically excluding cells of the immune system or via crosstalk mechanisms. Sonodynamic therapy (SDT) represents a novel approach for the treatment of cancer. The approach employs a sonosensitizer that is taken up by the target tissue (e.g., tumour). The sensitizer remains inactive in the absence of ultrasound, however on exposure to ultrasound, the sensitizer mediates the generation of cytotoxic reactive oxygen species (ROS). Since ultrasound transmits efficiently through most soft tissues and can be focused to a single point, a site-specific targeting effect can be achieved if the target contains the sensitizer. One of the major challenges therefore in achieving an efficiently targeted effect with SDT is ensuring that the sensitizer tracks to the tumour. Unfortunately, many of the efficient sonosensitizers are either cleared rapidly from circulation or are taken up by non-target tissues. In this presentation, we will discuss how nanotechnology can be exploited to ensure the sensitizer gets to the target tumour, demonstrate efficacy in preclinical models of pancreatic cancer and explore some of our findings relating to the impact of SDT on tumour stroma and immune suppression.

Prof. Dr. Salwa Elsayed Mohamed Elmeligie

Professor of Organic Chemistry, Faculty of Pharmacy,
Cairo University, Egypt.

Biography:

Prof. Dr. Salwa Elsayed Mohamed Elmeligie is a Quality Consultant for Higher Education since 2011 till now. She is also a Member of the Pharmaceutical Studies Sector Committee, Supreme Council of Universities, since November 2017 till 2021, The Founder and the Former Dean of Faculty of Pharmacy, Sadat City University since the preparation of the faculty 2014 till October 14, 2017. Ex-head of Pharmaceutical Organic Chemistry Department, Faculty of Pharmacy, Cairo University, since November 2011 to August 2016. Member of preparation NARS 2017 (CBE) by NAQAAE, April 2016. Author of "Green Pharmacy Education Book", published by Lap Lambert Academic Publishing, Germany, April 2016, Deputized at the National Authority of Quality Assurance and Accreditation of Education (NAQAAE), Egypt, from 2014 till 2016. Head of the team of reviewers conducted by the National Authority of Quality Assurance and Accreditation of Education (NAQAAE) for Accreditation Teams since 2011. Evaluation member conducted from the Permanent Pharmaceutical Studies Committee of Professors and Assistant Professors, promotion since 2009. And finally, The Founder and the Former Director of Career Centre, Faculty of Pharmacy, Cairo University, from 2012 to September 2013.

Title

Sustainable Development in Pharmacy: Present & Future

Abstract

Sustainable development in pharmacy is to afford unmet needs for the patients. This started with my dream in 2016, through my book "Green Pharmacy Education". It provides a brief description of how GC concepts have been implemented in education. It also deals with the outcomes of models and applications of other educational scientists, which play a fundamental role in sustainable developmental education. Now, the purpose of the present study is to develop practical recommendations for sustainable management of the enterprises working in the pharmacy according to the stakeholders' interests as well as taking in the consideration of the United Nations 17 SDGs specially No 3: good health and well-being and No 4: quality education. The biggest challenge of green pharmacy education is to utilize the 17 SDGs in practice. Currently, our interest is

focused on adopting them as a new trend in pharmaceutical teaching, learning methods as well as research plans to afford Patient Centric Education. The efforts to integrate them into the curriculum are still consistent with the needs of making education focused on sustainable development, influenced by motivations and attitudes. The introduction of the 17 SDGs into the curriculum would be significantly beneficial to the students, scientific community, and the breakthrough development of our country. Also, our vision is to enrich the educational curriculum with the best allocation of current resources to keep up with the continuous needs of sustainable development in Pharmacy. Thus, Pharmacy graduates would enter the career world with competency and sustainability coupled with motivation to improve the quality of life of individuals and communities as well as actively participate as an essential member of the healthcare team.

Dr. Nagwa Hashim

Head of the Giza Pharmacists Syndicate, Egypt

Biography:

Head of the Giza Pharmacists Syndicate, Egypt, Executive member of the Union of Arab Pharmacists

Title

The Role of Pharmacy on Healthcare

Abstract

As We already know that Healthcare is a system that is supported by many disciplines that is important to its growth. Specifically, one of these disciplines is Pharmacy. Pharma is the root word of Pharmacy, which is the knowledge and procedure of manufacturing as well as administration of drugs. To be more specific Pharmacy is a clinical health science that links medical science with chemistry, and it is charged with the discovery, production, disposal, safe and effective use, and control of medications and drugs.

pharmacy holds a critical role in the Healthcare system. Pharmacy's existence is to support and sustain the healthcare system. Including clinical services, reviewing medications for safety and efficacy, and providing drug information

Dr. Sara Zaghloul

Account Manager at Springer Nature, Egypt.

Biography:

Sara Zaghloul Holds a Bsc Pharmacy & Biotechnology degree from German University in Cairo. She is the Account Manager Egypt for Springer Nature, and she supports the Egypt OA Agreement. She closely works with institutions in Egypt to grow awareness on how to best benefit from library resources aiming to enable the librarians and researchers with the needed tools to advance discovery.

Title

Springer Nature strategies towards sustainable development goals.

Abstract

Springer Nature is a strong advocate of the SDGs, and the presentation will be discussing how open science/research has a role in the societal impact tackling current grand challenges.

Also, an overview of 1 year of publishing with the Fully Open Access agreement in collaboration with EKB and STDF elaborating on how the agreement was benefited from among the Egyptian researchers. To clarify and explain the eligibility criteria to increase the chances of MUST researchers' participation.

Day 1

SESSION 2: Innovative Research and Technology

Chairperson: Prof. Dr. Abdelrehim Mourad

Biography

Dr. Abdelrehim Mourad is Professor of Clinical Pharmacy at Misr University for Science and Technology (MUST). Dr. Mourad obtained his BSc. In Pharmacy from Cairo University. Dr. Mourad obtained his PhD in Clinical Pharmacokinetics from the University of Minnesota, USA. He did teach Clinical Pharmacy and conducted research at several universities in USA, Saudi Arabia, and Egypt. In 1975, Professor Mourad joined Riyad university, Saudi Arabia, and established and chaired the first department of Clinical pharmacy outside USA. This department provided clinical pharmacy services and training including therapeutic drug monitoring. Professor Mourad had several publications in the area of curriculum development, clinical pharmacy services, and education. Professor Mourad has an interest in the area of interpersonal communication and its impact on the quality of the services.

Prof. Dr. Khaled Meselhy Ibrahim Meselhy

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

Biography:

Khaled is a professor (pharmacognosy & medicinal plants) at the Department of Pharmacognosy, Cairo University & Head of Faculty of pharmacy Career & Entrepreneurship Center (FOPCC). He has more than 32 years of research experience in a variety of transdisciplinary aspects of medicinal and phytochemistry research, with a particular focus on bioactive natural products and the evidence-based use of food and medicinal plants. In addition to his research, Khaled has also been actively involved in scientific conferences and workshops. He has served as the Scientific Committee Head and chairperson for over 20 international conferences and has participated in more than 60 scientific conferences, presenting more than 30 talks and 90 sessions in workshops. His areas of expertise include aromatherapy, misuse of herbal drugs, implementation of new versions of NARS, active learning in pharmacy education, soft skills for medical students, writing effective exam questions, helping students to learn, optimizing questions in a valid and reliable exam, shifting to competency-based NARS in pharmacy, quality assurance terminology, strategic planning, accreditation, academic standards, personal branding, ideal career, artificial intelligence and digital pharmacy, food as medicine, and external and internal auditing.

In addition to his work as a professor and researcher, Khaled has also been involved in various roles related to education and community service. He served as a member of the technical and academic committee to develop new bylaws and educational programs for national projects in the Ministry of Higher Education. He also held the position of Head of the Pharmacognosy Department at MIU and served as Assistant Vice Dean for Community Service and Environment Development Affairs in the Faculty of Pharmacy Career and Entrepreneurship Center (FOPCU). Khaled has also been a member of the Curriculum Development Committee in the Pharmacognosy Department at both FOPCU and MIU. Through these roles, he has contributed to developing new educational programs and promoting community service and environmental development initiatives.

Khaled published about 50 papers in international journals that are indexed in Scopus and Web of Science. He has also served as a reviewer for about eight scientific journals, lending his expertise to ensure the quality and accuracy of research published in these journals. In addition to his work as a researcher and reviewer, Khaled has also been involved in evaluating innovative and patented projects. He has served as a judge in the Cairo International Exhibition of Innovation at the Academy of Scientific Research and Technology, as well as an evaluator in the 100 Hospital Development project in EDA

(Egyptian Drug Authority). Khaled is also a member of permanent scientific committees in EDA and the Presidency of the Council of Ministers. Khaled's experience as a researcher, reviewer, and evaluator reflects his dedication to advancing scientific knowledge and promoting innovation in various fields.

Title

Leveraging technology to enhance the sustainability, efficacy, and safety of PUFAs natural sources.

Abstract

Chronic diseases like CVD, hypercholesteremia, diabetes and arteriosclerosis addition to Cancer-related sarcopenia & Cachexia which is a multifactorial syndrome characterized by inflammation, anorexia, weight loss, and muscle/adipose tissue loss mediated by proinflammatory cytokines, e.g., TNF-α and IL-6, resulting in increased chemotherapy toxicity, costs, morbidity, and mortality. EPA can reduce inflammation and has the potential to modulate nutritional status/body composition. So, the selection of PUFA type and modifying the source is critical for facing chronic diseases as long-term use may need fine adjustments in the selection of the PUFA product or related source in these critical cases. Map of selection presented by technology intervention & fine-tuning of PUFA selection be discussed in the session.

Prof. Dr. Stanley Mukanganyama

Professor of Biochemistry at the Department of Biotechnology and Biochemistry, University of Zimbabwe

Biography

Stanley Mukanganyama is a full Professor of Biochemistry at the Department of Biotechnology and Biochemistry, University of Zimbabwe. He is the principal investigator of the Research Group Biomolecular Interactions Analyses Research Group http://www. bia.org.zw. He served as Secretary General-Federation of the African Societies for Biochemistry and Molecular Biology (FASBMB) 2011-2021 and as the President of the Biochemistry and Molecular Biology Society of Zimbabwe (BMBSZ) since 2021. Since 2021, he has served as the Dean of the College of Life Sciences for the Zimbabwe Academy of Sciences (ZAS) and since 2007, he has been a fellow of the Zimbabwe Academy of Science (ZAS). He was the head of the Biochemistry Department Biochemistry from 2010 to 2020 and he is the former president of the Natural Products Research Network for Eastern and Central Africa (NAPRECA-ZIMBABWE). In 2021, he was appointed a member of the IUBMB Fellowships Committee. The overall objective of his research project is to identify and characterize safe and effective natural plant product extracts and compounds from Zimbabwean medicinal plants for the sustainable and affordable management of infectious diseases caused by fungal, bacterial infections, or malignant tumours. Indigenous heritable products in the form of topical creams, ointments, antiseptics, and biocides will be formulated from the active extracts or isolated chemicals. Prof. Mukanganyama obtained his BSc Honours in Biochemistry (1991) and a D.Phil. from the University of Zimbabwe (2000). He carried out postdoctoral studies at the University of Cape Town in 2004 on ATP Dependent cassette (ABC) transporters from *Mycobacterium tuberculosis.*

Title

Tricks to Survive: Biochemical Mechanisms of Drug Resistance: Implications for Treatment of Microbial and other infection.

Abstract

Antimicrobials have been widely used to treat infectious infections in people and animals since 1928.However, antimicrobial resistance has become a concern. Resistant pathogen infections are a major cause of morbidity and drug costs. Inappropriate use and poor supply and access to therapy in medical clinics and hospitals have selected resistant microbial strains. Microbial and pathogenic organisms have evolved medication resistance mechanisms. These species pump medications out of cells, modify targets by integrating point mutations in genes, modify important enzymes for biosynthetic processes, degrade drugs with enzymes they produce, and secrete virulence factors.

Resistance to anti-infective agents can be intrinsic, where microorganisms naturally do not have target sites for antimicrobials and the agent does not affect them, or acquired, where a naturally susceptible microorganism acquires the mechanism of resistance to not be affected. Phosphorylation, acetylation, and adenylation by pathogens inactivate aminoglycosides, a frequent resistance mechanism. Bacterial β-lactamases hydrolyze β-lactam antibiotics Bacteria have chromosomally encoded genes for efflux pumps which are expressed constitutively or under certain environmental stimuli. The efflux pumps eliminate cell toxins. In bacteria, mycobacteria, fungi, and cancer cells, natural plant compounds block ATP-dependent drug (ABC) efflux pumps. Natural compounds also inhibit biofilm formation in bacteria and fungi, re-sensitizing cells to antimicrobial medicines. Natural plant compounds can also block xenobiotic metabolizing enzymes overexpressed in cancer cells to mediate anticancer drug resistance and insect and protozoal enzymes involved in insecticide and antimalarial drug resistance. Screening natural products for metabolites that reverse microbial, anticancer, and insecticide resistance can still solve clinical medication resistance issues.

Prof. Dr. Gomaa Ali Sanad

Associate Professor, Chemistry Department, Faculty of Science, Al-Azhar University, Assiut

Biography

Dr. Gomaa A. M. Ali is an Associate Professor at the Chemistry Department, Faculty of Science, Al-Azhar University, Egypt. He has 15 years of experience working in the research areas of materials science, humidity sensing, graphene, supercapacitors, water treatment, and drug delivery. He was awarded his Ph.D. in Advanced Nanomaterials for Energy Storage from UMP, Malaysia. He is the recipient of some national and international prizes and awards such as TWAS-AREP (2018), ARSCO Award (2022), Obada International Prize (2021), Arab Water Council Award 2022, Gold Medal (Archimedes, Russia, 2014), Green Technology Award (CITREX, Malaysia, 2015), Gold Medal (British Invention Show, UK, 2015). Dr Gomaa has been included in Stanford University's List of World's Top 2% of Scientists, Egypt. Dr. Gomaa has published over 137 journal articles and 22 book chapters on a broad range of cross-disciplinary research fields, including multifunctional materials, nanotechnology, supercapacitor, water treatment, humidity sensing, biosensing, corrosion, and drug delivery. So far, he has more than 4697 citations and an h-index of 42. Dr. Gomaa is an Editor of many international journals and a reviewer for more than 80 WoS journals. Dr. Gomaa is a member of national and international scientific societies, such as TWAS Affiliate, AAS Affiliate, the American Chemical Society, the Royal Society of Chemistry, the National Committee of Pure and Applied Chemistry, and the Egyptian Young Academy of Sciences, ASRT. He is an Editor of many handbooks such as "Waste recycling technologies for nanomaterials manufacturing" Springer, 2021, and "Handbook of Biodegradable Materials" Springer, 2022.

Title

Waste Recycling Technologies for Nanomaterial Sustainability

Abstract

Waste accumulation is a serious environmental problem. Therefore, recycling waste into valuable nanomaterials is highly required, where it has environmental and economic benefits. In addition, nowadays, nanomaterials are used in many areas and applications, including medicine, energy, and the environment. The initial cost of the nanomaterials is high; thus, finding another cheap source is required. Electrochemical materials, including metal oxides (MnO2 and Co3O4), carbon-based materials (CNS), and their composites

(MnO2/rGO), have been prepared in diverse morphologies (nanoflowers and nanosheets) from waste precursors. These waste precursors include spent batteries (Zn-C and LiB) and agriculture waste (oil palm leaves, lablabs, palm kernel shells, and eggshells). Different physical and chemical characterizations were conducted to investigate the material structure and morphology. The electrochemical properties of these materials have been studied comprehensively using cyclic voltammetry, galvanostatic charge-discharge, and electrochemical impedance spectroscopy to evaluate their suitability for super capacitive energy storage. Therefore, an asymmetrical supercapacitor was fabricated and electrochemically evaluated. It shows a superb super capacitive performance.

Prof. Dr. Raffat Fahmy

Science Advisor Food and Drug Administration, USA

Biography

Raafat Fahmy, Ph.D., has over thirty-five years of experience in the pharmaceutical industry. Dr. Fahmy joined the FDA in 1999 serving as a science advisor and brings with him experience with collaborating on research in academic, government, and global platforms. He also serves as an expert in many United States Pharmacopeia committees.

Dr. Fahmy provides leadership in the areas of drug product formulation, manufacturing technology, including the evolving field of dissolution, formulations, manufacturing, and chemometrics. He also works with other experts from many government organizations to provide scientific expertise in the development of policy and guidance in the area of drug development and manufacturing processes. In addition, he communicates with and provides clear guidance to the regulated pharmaceutical industry for the reporting of specific technical issues relating to drug formulation and manufacturing.

Dr. Fahmy addresses important issues specifically related to the manufacturing of oral dosage forms and is often asked to assess technical matters associated with major and minor manufacturing or formulation changes. Dr. Fahmy is typically the spokesperson and authoritative source of information and advice on related topics.

Dr. Fahmy's critical path research supports innovation and efficiency in pharmaceutical development, manufacturing, and quality control. His collaborative research projects with the University of Maryland School of Pharmacy for 24 years had a profound impact in manufacturing science and improving the scientific basis for understanding the behavior of pharmaceutical materials and allows for the development of robust processes early in the development process using the concept of quality by design and online process control, which has had a positive impact on the regulated industry inside and outside the USA and the Agency.

His contributions are celebrated by the FDA, academia, and the pharmaceutical industry and enjoys attending conferences to present his findings on his critical path research.

Dr. Fahmy has authored 5 textbook chapters, and 45 scientific papers.

Title

Using Artificial Intelligence in Formulation and Manufacturing, current advantages, and future challenges

Abstract

With the high costs and low success rate associated with the traditional methods currently used in support of drug product development, the pharmaceutical industry is

exploring the use of artificial intelligence (AI) as a platform for transforming their current business practices. Based upon recent publications, the vision being promulgated is that AI will help to accelerate drug discovery and design processes, optimize drug product formulation, enhance the efficiency of clinical trials, and enable the delivery of personalized medicines, ultimately leading to safer and more effective therapies.

Another potential application of AI is in its use for optimizing manufacturing process and control strategies. By simultaneously analysing all process parameters and raw material attributes, AI can identify patterns and correlations between these variables and the resulting effect they have on in vitro and in vivo product performance. In so doing, these algorithms can be used to identify critical process parameters, predict equipment capabilities, and optimize manufacturing process and the formulations. The consequence of such efforts is that it provides a highly efficient and cost-effective mechanism for identifying product critical quality attributes, thereby leading to consistently high product quality and performance.

With these points in mind, it is predicted that AI will emerge as an integral component of drug design, product development, and optimization of manufacturing process. However, it is essential that proper validation, regulation, and ethical considerations are incorporated into the development and deployment of AI systems in all pharmaceutical applications.

The focus of this presentation will be on the use of current AI applications in formulations and manufacturing processes, as well as the future challenges.

Dr. Kristina Haslinger

Department of Chemical and Pharmaceutical Biology, University of Groningen, Groningen, Netherlands

Biography

Kristina Haslinger conducted her PhD research at the Max Planck Institute for Medical Research in Heidelberg, Germany (2014). After a postdoctoral period with Prof. Kris Prather at MIT (USA), she started her independent research group in 2020 as an Assistant Professor at the University of Groningen, The Netherlands. Her research revolves around the analysis and engineering of biosynthetic pathways with the goal to establish sustainable production routes towards pharmaceutically relevant natural products and their derivatives. Her group pursues in vitro biocatalytic approaches as well as fermentative routes with genetically engineered bacteria and filamentous fungi.

Title

Discovery and characterization of oxygen-directed methyltransferases acting on pharmaceutically relevant natural product scaffolds.

Abstract

Oxygen-directed methylation is a ubiquitous reaction in natural product pathways catalyzed by O-methyltransferases (OMTs). Methyl groups influence the bioactivity of the resulting products by altering their water solubility, membrane permeability, and stability, and by providing crucial structural features for cellular targeting. Therefore, methylation is frequently used by medicinal chemists in the design of bioactive molecules. Compared to enzymatic methylation, however, achieving regioselective methylation can be challenging with chemical methods. Thus, promiscuous OMTs are valuable biocatalytic tools for sustainable synthesis and optimization of known bioactive scaffolds in drug development. This work focuses on identifying and applying novel OMTs for diversifying various privileged natural product scaffolds. With the help of our recently developed rapid in vitro screening platform for OMTs, we identified two bacterial OMTs with intriguing properties: an OMT from Streptomyces avermitilis with robust and high catalytic activity both in vitro and in vivo, and an OMT from Desulforomonas acetoxidans with medium catalytic activity despite various sequence deviations from other known bacterial OMTs including absence of the canonical catalytic triad. I will show that these sequence features are conserved among homologues of the latter enzyme and that its crystal structure does not reveal how the absence of the catalytic triad is compensated for. Both OMTs methylated a wide range of catechol-like substrates, including flavonoids,

coumarins, hydroxybenzoic acids and their respective aldehydes, an anthraquinone and an indole. One enzyme also accepted steroids. Interestingly, certain non-catechol flavonoids and hydroxybenzoic acids were also methylated. This study expands the knowledge on substrate preference and structural diversity of bacterial catechol OMTs and paves the way for their use in biocatalytic synthesis routes.

Day 2

SESSION 1: Multiomics and Precision Medicine

Chairperson: Prof. Dr. Maha Ali Eissa

Dr. Wael Ali

General SECRETARY of EMRO pharm-FIP forum eastern Mediterranean region.
President of Egyptian organization of pharmacy, Development and Training
Executive consulting member of Faculty of pharmacy, Alsharja university- Emirate

Biography

- President of Egyptian organization of pharmacy. (EOP)
- General Secretary of EMROpharm forum-member of steering committee.
- Executive committee consultant in school of pharmacy-ALSharjah University-Emirates.
- Mentor in FIP-pharma Bridge project.
- Patron in live-well initiative organization in Nigeria.

Previous position:

- Executive committee member of Health and medicine information section (HAMIS) Representative for Middle East and Africa.
- Member in the committee -Abudhabi FIP-2019, United Emirates pharmacists' society (EPS).

I Wael worked in pharmacy and health systems for over 22 years. He served as CEO of American Pharmaceutical Industries, Based in USA, and the regional office in Egypt.
Wael Ali, has a bachelor's degree in pharmacy 1999 (BPharm) and Master of business administration (MBA), 2011.
He has worked as a community pharmacist, social and administrative pharmacy, medicine information pharmacy in Egypt, GCC and USA.
Then CEO of pharmaceutical company in USA.
Wael has actively combined his practice, experience and research throughout his career.
Wael has co-authored much research in clinical pharmacy, community pharmacy and public health. Many peer-reviewed, evaluate research and articles.
He has contributed in many publications and has given over 60 presentations on various topics in United state of America, Egypt,UAE,KSA,Bahrain,....etc
Wael has more than 23 years' experience in the Pharmacy profession; includes: 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.
In 2018 Wael has taken on the role of General Secretary of EMRO pharm forum (Middle East pharmacists forum)
Wael has much research in public health and medicine information.
He got award in The FIP Congress 2015 held in Duslsorf, Germany for his research in clinical pharmacy (in Egypt; wave of Painkiller a ddiction) And much research in hepatitis C in Egypt.
Wael got many awards for his works and activities from many universities and pharmacy schools over the world.
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.
Official consultant and official Mentor in Nigerian-FIP pharmabridge project.

Title

FIP: Shaping the Global Future of Pharmacy Specialization and Workforce in the Era of innovation Hackathon

Dr. Lars-Åke Söderlund

Vice President of International pharmaceutical federation (FIP), Swedish

Biography

holds a position as Vice President for the Business Area Healthcare & Enterprises, within Apoteket AB and works with strategic development of community- and hospital pharmacy. He is also Head of National Customers and New Businesses within Apoteket AB. He is an Executive Committee member within the Community Pharmacy Section/FIP, as well as a member of the Program Committee, FIP. He also serves as a Mentor and Abstract Reviewer for FIP. Dr. Söderlund is a frequent speaker in Sweden and Internationally at Congresses regarding clinical & pharmaceutical services, the future of pharmacy and the integration of the pharmacy function within the health care system. As such Lars-Åke Söderlund has been working with Health care authorities in Sweden, Spain, United Kingdom, Brazil and China regarding the development the of pharmacy services, and the integration of pharmacy pharmaceutical services within the health care system. Dr. Söderlund has been lecturing in China since 2010. Dr. Söderlund is a Board Member and Vice Chairman of the Swedish Pharmaceutical Society, and President for the National project.

Title

FIP: Shaping the Global Future of Pharmacy Specialization and Workforce in the Era of innovation Hackathon

Prof. Dr. George P. Patrinos

Professor of Pharmacogenomics and Pharmaceutical Biotechnology, Department of Pharmacy, University of Patras, Greece

Biography

George P. Patrinos is Professor of Pharmacogenomics and Pharmaceutical Biotechnology in the University of Patras (Greece), Department of Pharmacy and holds adjunct Professorships at Erasmus MC, Faculty of Medicine, Rotterdam (the Netherlands) and the United Arab Emirates University, College of Medicine, Department of Pathology, Al-Ain (UAE). Also, he served for 12.5 years (2010-2022) as Full Member and Greece's National representative in the CHMP Pharmacogenomics Working Party of the European Medicines Agency (EMA), since 2018 Co-Chair of the Global Genomic Medicine Collaborative (G2MC) and since 2020 Editor-In-Chief of the prestigious Pharmacogenomics Journal, published by Nature Publishing Group.

George has more than 310 publications in peer-reviewed scientific journals, some of them in leading scientific journals, such as *Lancet, Nature Genetics*, *Nature Rev Genet*, *Nucleic Acids Res*, *Genes Dev* and has co-edited the textbook "Molecular Diagnostics", published by Academic Press, now in its 3rd edition, and several other international textbooks, while he is the editor of "Translational and Applied Genomics" book series.

Apart from that, George is the main co-organizer of the Golden Helix Conferences, an international meeting series on Pharmacogenomics and Genomic Medicine.

Title

Genome-guided therapy: The Medicine of Tomorrow, today.

Abstract

Genome-guided treatment or pharmacogenomics is considered to be the cornerstone in modern medical practice. The PREPARE study is the central pillar of the "Ubiquitous Pharmacogenomics" project (U-PGx, www.upgx.eu), the 1st European study of the implementation of Pharmacogenomics in clinical practice. It started in 2016, within the Horizon 2020 program, and involves clinical centres seven European countries, including Greece, represented by the Laboratory of Pharmacogenomics and Personalized Therapy of the Department of Pharmacy of the University of Patras. The study aims to determine whether pre-emptive pharmacogenomic analysis of clinically important biomarkers will lead to a reduction in adverse drug reactions associated with each patient's genotype. The study results are expected to lead to safer and more economically and clinically effective treatments, helping to improve the quality of life of patients and their caregivers.

Similarly, the Em-HEART project is the first prospective pharmacogenomics clinical study in Middle East and Asia, envisaging to recruit more than 2000 cardiovascular disease patients in the UAE. These studies can contribute to bypass the obstacles that still hold back the field and would allow the smooth integration of genome-guided treatment in the clinical practice.

Dr. Mahmoud Nazih

BCPS, GAB, IRM, American Board Instructor, Scientific Office Member Egyptian Society of Pharmacogenomics and Personalized Medicine (ESPM).

Biography

Dr. Mahmoud Nazih obtained his B Pharm in 2012 from Cairo University,
American Board Instructor.
Scientific Office Member Egyptian Society of Pharmacogenomics and Personalized Medicine (ESPM).
Master's degree in Pharmaceutical Biotechnology. Clinical Pharmacogenomic Specialty 2020.
Certified American Board Pharmacotherapy Specialty – 2021.
Master's degree in clinical pharmacy.
Graduate in Harvard University fellowship of "Clinical Scholars Research Training CSRT" 2021.
Diploma of Genomic Analysis and Bioinformatics – 2022.
Head of Scientific Office in the Egyptian Society of Pharmacogenomics and Personalized Medicine (ESPM) since May 2019.
Head of MW-Pharm++ and Personalized Medicine Department in Scientific office of PGx Company "MW-Pharm++ is European PK-PD, and Genetic Software was awarded in 2013 as the world's best solution for TDM" 2020- 2022.
One of the editors of Pharmacogenomic and Personalized Medicine Book (Genomic Therapy Book)
One of the authors of Killing the Killer Book (Oncology Therapy Book).

Title

Catalyzing Breakthroughs: Pharmacogenomics for Safer, More Effective Drug Treatment

Abstract

Pharmacogenomics is a cutting-edge field that combines genetics and pharmacology to optimize drug treatment and improve patient outcomes. This abstract delves into the significance of pharmacogenomics by highlighting its importance from a statistical, pharmacoeconomic, and therapeutic perspective. It specifically focuses on cardiovascular disease, oncology, and the remarkable impact of pharmacogenomics on drug treatments such as clopidogrel, warfarin, and gamtizunab.
Statistics Clarifying the Importance of Pharmacogenomics:

This abstract provides statistical evidence to emphasize the vital role of pharmacogenomics in modern medicine. It presents data on the prevalence of adverse drug reactions and the economic burden of ineffective treatments. By incorporating pharmacogenomic information into clinical decision-making, healthcare providers can significantly reduce adverse events, enhance treatment efficacy, and optimize healthcare resource allocation.

Cardiovascular Disease and the Role of Pharmacogenomics:

The abstract examines the application of pharmacogenomics in cardiovascular disease, focusing on drugs like clopidogrel and warfarin. It highlights the genetic variations that influence the metabolism and response to these medications. By tailoring treatment strategies based on individual genetic profiles, pharmacogenomics enables safer and more effective use of these drugs, reducing the risk of adverse events and enhancing patient outcomes.

Oncology Disease and the Impact of Pharmacogenomics:

In the context of oncology, particularly hepatocellular carcinoma (HCC), this abstract explores the significant roles of pharmacogenomics in treatment. It discusses how genetic variations can affect drug metabolism and response in cancer patients. Pharmacogenomics-guided therapy allows personalized treatment plans, optimizing drug selection and dosage, and minimizing toxicities. Such precision medicine approaches can improve treatment outcomes and enhance patient survival rates.

The Remarkable Story of Gamtizunab and Pharmacogenomics:

This abstract sheds light on the remarkable journey of the drug gamtizunab and its strong connection to pharmacogenomics. It outlines how pharmacogenomics played a pivotal role in the development and successful application of gamtizunab. By identifying genetic markers that influence drug response, researchers were able to optimize treatment outcomes and minimize adverse events, demonstrating the power of pharmacogenomics in personalized medicine.

In conclusion, this abstract highlights the pivotal role of pharmacogenomics in catalyzing breakthroughs in safer and more effective drug treatments. Statistical evidence showcases the importance of integrating pharmacogenomic information into clinical decision-making to improve patient outcomes and optimize healthcare resource allocation. Focusing on cardiovascular disease, oncology (HCC), and the remarkable story of gamtizunab, it underscores the significant impact of pharmacogenomics in these therapeutic areas.

Keywords: pharmacogenomics, Pharmacoeconomics, cardiovascular disease, clopidogrel, warfarin, oncology, hepatocellular carcinoma (HCC), gamtizunab, personalized medicine, treatment optimization, adverse events, treatment outcomes drug safety, drug efficacy, adverse reactions, clinical practice.

Ass. Prof. Dr. Theodora Kastila

Head of the Biomarker Discovery & Translational Research Lab, Institute of Chemical Biology, National Hellenic Research Foundation, Greece

Biography

Dr. Theodora Katsila serves as a Research Assistant Professor - Head of the Biomarker Discovery & Translational Research laboratory at the Institute of Chemical Biology, National Hellenic Research Foundation, Greece. Her team applies a. mass spectrometry-based multi-omics and profiling of extracellular vesicles, b. 3D cell models and cheminformatics, c. ADME-Tox in 3D, and d. machine learning, deep learning and computational statistics to disrupt healthcare solutions and empower biomedical innovation.

Dr. Katsila is an expert in translational biomarkers upon the chemical biology prism, namely both molecular and digital biomarkers. She is actively involved in policymaking, standardization and open-science initiatives as a Global Genomic Medicine Initiative steering committee member and Family Health History flagship project co-chair, Human Proteome Organization committee member, Metabolomics Society member and Females in Mass Spectrometry mentor. She is a prolific author, editor, and speaker; a recipient of corporate, national and European grants; an award-winning scientist; and a co-inventor of a patent.

Title

Multi-omics of extracellular vesicles and AI in drug repurposing.

Abstract

Extracellular vesicles are highly informative based on their size, number, morphology, and molecular content of their cell of origin and cell-recipient. We are strongly interested in extracellular vesicles as circulating translational biomarkers of choice when inter-individual variability, drug resistance, and adverse drug reactions are considered. To us, seeing is believing. At the same time, by understanding the fundamental flaws in our perceptions, we become more aware via multi-omics and AI. For this, we are connecting the dots upon wet- and dry-lab pipelines to map “circulating” multi-omic networks to better inform drug repurposing.

Dr. Rainer Juhani Lehtonen

Senior researcher in the Systems Biology of Drug Resistance in Cancer (Hautaniemi Lab), Research program in Systems Oncology, Faculty of Medicine, University of Helsinki.

Biography

Dr. Lehtonen is a senior researcher in the Systems Biology of Drug Resistance in Cancer (Hautaniemi Lab) Research program in Systems Oncology at the Faculty of Medicine of the University of Helsinki. He received his Ph.D. in Medical Genetics from the University of Helsinki, Finland, Faculty of Medicine, Department of Medical Genetics. He earned his MSc. Degree in Genetics, Faculty of Biosciences, Department of Biological and Environmental Sciences University of Helsinki, Finland. The MSc degree incorporates studies in animal physiology, morphology, and ecology in addition to genetics. From 2009 to 2013, Dr. Lehtonen was a senior researcher with the Metapopulation Research Group (led by Professor Ilkka Hanski of the University of Helsinki's Department of Biological and Environmental Sciences). He was the leader of the genome and genetics project for the Glanville fritillary butterfly within the Metapopulations Research Group. During the project, the entire genome of the Glanville fritillary butterfly was sequenced using next-generation sequencing technologies, followed by large-scale population-based SNP detection. The influence of genetic variation was to be examined on the individual, population, and metapopulation levels. The initiative was funded for five years by the European Research Council (ERC) and the Academy of Finland. From 2006 to 2009, he was a Post-Doctoral Fellow with the Tumour Genomics Group (led by Lauri A. Aaltonen, Professor of Tumour Genomics at the University of Helsinki and Research Professor at the Academy of Finland), Genome Scale Biology Research Program, University of Helsinki, Department of Medical Genetics/ Biomedicum/ University of Helsinki. Dr. Lehtonen published numerous articles in prestigious scientific journals. In addition, he was the Representative of the Tumour Genomics Group in the Nordic Network of Excellence in Disease Genetics Consortium from 2005 to 2009 and a member of the University of Helsinki's Privacy Protection Board from 2006 to 2007.

Title

Toxicity and therapy outcome associations in candidate variants in high-grade serous ovarian cancer.

Abstract

To identify genetic associations in ovarian cancer chemotherapy-induced toxicities and therapy outcomes, we examined a cohort of 101 patients receiving carboplatin-paclitaxel treatment with advanced high-grade serous ovarian cancers. We selected 19 candidate

polymorphisms, designed a multiplex single nucleotide polymorphism-genotyping assay for the association analyses. We found multiple significant associations. Our results suggest that SLCO1B3 and LIG3 variants are associated with the risk of adverse effects in patients receiving carboplatin-paclitaxel treatment, the GSTP1 variant may affect the treatment response and ABCB1 and OPRM1 variants may influence the prognosis. The SLCO1B3 rs1052536 AA-genotype was associated with a reduced risk of any severe toxicity (Cox-regression test, hazard ratio = 0.35, p = 0.023). LIG3 rs1052536 T-allele was associated with an increased risk of neuropathy (odds ratio [OR] = 2.79, p = 0.031) and GSTP1 rs1695 G allele with a poorer response in the first-line chemotherapy (OR = 2.65, p = 0.026) (Chi-square allelic test). In Kaplan–Meier survival analysis, ABCB1 rs2032582 TT-genotype was associated with shorter overall survival (uncorrected p = 0.025) and OPRM1 rs544093 GG and GT genotypes with shorter platinum-free interval (uncorrected p = 0.027) and progression-free survival (uncorrected p = 0.012).

Day 2

SESSION 2: Good Health and Well-being

Chairperson: Dr. Hoda Shamloula

Dr. Islam Usama

Pharmacovigilance manager – MUP, Global Qualified person for Pharmacovigilance (QPPV)

Biography

Pharmacovigilance manager, Global Qualified Person for Pharmacovigilance (QPPV), 20 years of experience in the pharmaceutical field.

Title

White paper on allergy & anaphylaxis in Egypt: how to manage.

Abstract

Recently, an increase in the rates of publishing allergic cases of medication has been observed, some of which have died, which requires studying to identify the nature of the problem through the available data, so we conducted a literature screening of most of the reported and published cases.

After screening and assessment, we found that: The most important factors that harmed patients are undiagnosed & untreated anaphylaxis and the main cause of death was primarily Misdiagnosis, the HCP wasn't able to diagnose the case accurately, is it simple allergy or anaphylaxis. Secondly Wrong management of anaphylaxis as some of HCPs or the person's deal with the cases didn't apply the right protocol for managing anaphylaxis.

The clinical diagnosis of anaphylaxis is somewhat intricate, and it is generally agreed that the condition is under recognized and underreported. Therefore, we have written this paper to diagnose the problem to be discussed among the medical community and to serve as a guide for the diagnosis and management of anaphylaxis following the updated guidelines to increase knowledge and awareness among HCPs and thus save patients' lives.

In this paper we have focused on early use of epinephrine which we believe is the main issue because we monitored a remarkable fear among HCPs about its use.

Dr. Naveen Vankadari

Research Fellow, Monash University, Biomedicine Discovery wing, Australia.

Biography

Dr. Naveen is a Research Fellow at Monash University in Biomedicine Discovery wing in Australia. He received his PhD in biochemistry and molecular cell biology from Taiwan's National Defence Medical Centre. He also has extensive BioTech industry experience from his time as an R&D researcher at MerckMillipore. His research has been widely recognized around the world, and he has received numerous awards and prizes in academia and industrial research. His current research is primarily focused on events central to human infection, specifically different viral and bacterial proteins involved in infection, disease progression and its control. His key research technical areas include cryo-electron microscopy, X-ray crystallography, protein biochemistry, and computational biology approaches. Dr. Naveen's current research focuses include structural virology, unravelling the entry mechanics of the SARS-2 causing COVID-19, and clinical drug screening approaches.

Title

Structural landscape of SARS-CoV-2 entry and activation of spike glycoprotein by engaging unique host factors & potential interventions

Abstract

The ongoing COVID19 pandemic caused by SARS-CoV-2 with lower respiratory tract infections, is an enduring public health concern. Emergence of new immune evading variants are challenging the current effective vaccines and several antiviral treatments are being clinically evaluated to fill the "therapeutic gap" in treating infected people. Understanding the entire repertoire of diverse host factors engaged by SARS-CoV-2 for entry and pathogenicity is required for long-lasting potential therapeutics or vaccines. Here, using a structural and molecular approach, we show multistage processing of SARS-CoV-2 spike-protein for virion activation, infection, and how mutations influence it. We solved the structures of spike protein in complex with different host cell factors (TMPRSS2, Furin, CD26, and NRP1) with functional activity, and these insights into uncovering how viral spike-protein engages and primed with these multiple host factors, in addition to ACE2, to hijack host cell entry. Furthermore, our COVID19 patient genome sequencing reveals that allele in TMPRSS2 (V160M), and Furin provided protection from COVID19 infection, and its structural mechanism is further addressed and potential drug clinical trials. Additionally, our large-scale retrospective cohort studies proved Arbidol

and derivatives as potential therapies for COVID19. Using structural studies, we demonstrated the mechanism of action of Arbidol in disrupting spike function. These findings cognize the complete mechanism of viral spike-glycoprotein processing/priming that leads to cascading entry into the host cell, paving the door for future vaccine development and identifying key targets. Our comprehensive research reveals the complexity of the SARS-CoV-2 spike-protein and clinical studies aid in therapies.

Prof. Dr. Tomas L. Lindhal

Professor at Department of Biomedical and Clinical Sciences, Linköping University, Sweden

Biography

Tomas L. Lindhal is Professor of Clinical Chemistry at the Department of Biomedical and Clinical Sciences at Linköping University, Senior Consultant at the Department of Clinical Chemistry at the Linköping University Hospital, and Deputy Head for Research at the Department of Biomedical and Clinical Sciences. In 1978, he earned a Bachelor of Science in Chemistry and Biology from Uppsala University. In 1982, he received his medical degree from the Faculty of Medicine at Uppsala University. In 1989, Prof. Lindhal earned his Ph.D. in Clinical Chemistry from the Karolinska Institute in Stockholm. Since 1990, he has been a certified specialist in clinical chemistry. He is the primary tutor for two PhD candidates and has been the primary tutor for nine PhD candidates. According to Clarivate Web of Science, he had 160 publications (excluding abstracts and proceedings) and an h-index of 36 as of April 2023. Prof. Lindhal served as president of the 47th Nordic Coagulation meeting held in Visby in September 2014 and as a member of the organizing committee for the 54th meeting to be held in Tylosand in 2021. He was a member of the international scientific advisory committee of the European Platelet Network (EUPLAN) and has been its national representative since its founding in 2010. Since 2017, he has been the Swedish representative for the European Haemostasis and Thrombosis Alliance. Since 1994, he has been a member of the External Quality Assurance in Laboratory Medicine in Sweden (EQUALIS) expert group for coagulation, and since 2019-23, he has served as its chairman. From 2005 to 2011, Prof. Lindhal served on the board of the Swedish Association for Clinical Chemistry. Since 2007, he has been a council member of the Swedish Society on Thrombosis and Haemostasis (SSTH) and the scientific secretary of both organizations. He has been a member of the Swedish Heart-Lung Foundation's scientific council since 2021 and the International Society on Thrombosis and Haemostasis Nominating Committee since 2020. From 2020 to 2022, he served as the Editor of the Scandinavian Journal of Clinical and Laboratory Investigation. Prof. Lindhal serves on advisory committees and/or consultancies for numerous pharmaceutical and diagnostic firms, including Abbott, Alexion, AstraZeneca, Bayer, Boehringer-Ingelheim, Bristol-Myers Squibb, KaroBio, Medirox, Nordic Biomarker, Portola, Radiometer, Roche Diagnostics, Siemens, and Zafena. Member of Medirox AB's Board of Directors from 2011 to 2018. He was co-founder and chairman of the board of Nordic Haemostasis AB until late 2022, when the company was acquired by another company.

Title

Associations between hemostatic markers and mortality in COVID-19 with focus on fibrinolysis

Abstract

In the 217 consecutive patients who underwent COVID-19 testing upon admission to the Linköping University Hospital between April and June 2020, laboratory markers describing hemostatic function were measured. The cumulative incidences of death and venous thromboembolism were 24.0% and 19.8% in the 96 patients who tested positive for SARS-CoV-2 (COVID-19+) compared to 12.4% (p=0.031) and 11.8% (p=0.13) in the 121 patients who tested negative (COVID-19-). Plasma levels of von Willebrand factor (vWF) and fibrinogen were significantly elevated in COVID-19+ patients. Excess mortality was observed in COVID-19+ patients with high D-dimer, low antithrombin, or low plasmin-antiplasmin complex (PAP) formation, with Odds Ratios (OR) for death of 4.7 for D-dimer >0.5 mg/L, 5.9 for antithrombin (AT) <0.85 kIU/l, and 4.9 for PAP<1000 g/L, respectively. The odds ratios for death were 15.7 for patients with PAP <1000 g/L and D-dimer >0.5 mg/L and 15.5 for patients with PAP <1000 g/L and AT <0.85 kIU/L among COVID-19+ patients with combined defects in markers of fibrinolysis and coagulation. We observed an increased fraction of incompletely degraded D-dimer fragments in COVID-19+ patients with low PAP, indicating impaired fibrinolytic degradation of cross-linked fibrin, which we hypothesize may be indirectly related to the poor prognosis.

Ass. Prof. Gihan Elsisi

Managing Director, HTA office Middle East and North Africa.

Biography

Gihan Hamdy Elsisi, Msc, PhD is Assistant Prof, American University in Cairo. She is the founder and former Head of Pharmacoeconomic 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 Pharmacoeconomics /pharmaceutical sciences from Ain Shams University and certified in Health Economics (HE) and Outcomes Research, University of Washington. Through the CAPA, Elsisi was able to successfully incorporate Pharmacoeconomics 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 Pharmacoeconomic Guidelines for Egypt, International Society for Pharmacoeconomics and Outcomes Research (ISPOR). She is an executive member in HE Diploma Committee, American University in Cairo. 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 in HE 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.

Title

Job opportunities in Pharmacoeconomics: one journey and many destinations

Abstract

Following questions that we ask within 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. So certain **Steps towards the implementation are undertaken including** Effective pharmaceutical pricing and reimbursement systems, based on health technology assessment (HTA) that encompasses economic evaluations, are essential to an efficient sustainable health care system. All Egyptian Health authorities were encouraged to establish HTA unit, as an initial step, for the support of pricing and reimbursement decisions. We anticipate that standardization of reporting would lead to progressive improvement in the quality of submissions over time and provide Egyptian healthcare system with health economic evidence often unavailable in the past. Recommendations for pharmacoeconomic evaluations provide an essential tool for the support of a transparent and uniform process in evaluation of the clinical benefit and costs of drugs that do not rely on the use of low acquisition cost as the primary basis for selection.

Prof. Dr. Nikolitsa Nomikou

Professor of Advanced Therapeutics, Department of Surgical Biotechnology, University College London (ULC), United Kingdom

Biography:

Professor Nomikou completed her doctorate in Biomedical Sciences at Ulster University in 2008. She was appointed as Lecturer in Targeted Therapeutics at UCL in September 2013, she was then promoted to Associate Professor in October 2019 and to Professor of Advanced Therapeutics in October 2021. Her current research focuses on the development of translational drug delivery approaches based on formulations/carriers that are responsive to different forms of energy (electromagnetic fields, ultrasound), as well as responsive to the cancerous microenvironment. Her recently published and current funded research has demonstrated the potential of site-specific and minimally invasive treatments based on low-intensity ultrasound and light, named sonodynamic and photodynamic/photothermal therapy, respectively. The potential of these therapeutic approaches to efficiently manage aggressive and advanced-stage cancers has been strongly augmented by novel therapeutic formulations that respond to either externally applied or tumour-specific stimuli. Professor Nomikou's team aims to optimize these therapeutic modalities using nanotechnology for maximizing their potential in the clinic.

Title

Exploiting the tumour microenvironment in order to optimise sonodynamic therapy for cancer.

Abstract

Sonodynamic therapy (SDT) is a therapeutic approach that uses ultrasound and sensitizers such as porphyrins to produce cytotoxic reactive oxygen species (ROS) and confined ablation of tumours. It does not require highly toxic agents and the cytotoxic effect only occurs upon ultrasound exposure, at the site of the lesion. SDT has been shown to be effective and targeting, but has yet to be fully characterised, optimised and exploited for the treatment of cancer. This study developed a formulation based on multistimulus-responsive sensitizer-containing nanoparticles that can accumulate in advanced prostate tumours and increase the therapeutic efficacy of SDT. The formulation is based on a polyglutamate-tyrosine (PGATyr) co-polymer carrying hematoporphyrin. The efficacy of

SDT was demonstrated using prostate cancer as the translational exemplar. The formulation was designed to respond to the microenvironment of advanced prostate tumours, such as the overexpression of proteolytic enzymes, cathepsin-B and prostate-specific membrane antigen (PSMA). The therapeutic modality was tested in vitro using prostate cancer cell lines and in vivo, using male SCID mice bearing LNCaP subcutaneous tumours. We have demonstrated that the PGATyr co-polymer is digested by cathepsin B, leading to decreased nanoparticle size and increased cellular uptake. Sonodynamic treatment at both normoxic and hypoxic conditions showed ultrasound-induced cytotoxic effects only for the nanoparticle-treated prostate cancer cells, while toxicity of the formulation in the absence of ultrasound was minimal. In vivo studies in immunodeficient mice showed a 50% decrease in LNCaP tumour volumes within 24h, following IV administration of a single dose. No adverse effects were recorded, and my body weight was stable. This study demonstrates the potential of SDT as a fist line or combination treatment for the elimination or downstaging of difficult to treat cancers, such as prostate, pancreatic, and advanced colorectal cancer.

Dr. Hafiz Arshad

Researcher in the Lamberton lab, School of Biodiversity, One Health & Veterinary Medicine, University of Glasgow, Scotland, UK.

Biography

Dr. Hafiz Arshad currently works as an affiliate researcher in the Lamberton lab, School of Biodiversity, One Health & Veterinary Medicine, University of Glasgow, which he joined soon after completing his PhD in the parasitic infection metabolism funded by the Student Excellence Award at the University of Strathclyde in 2022. He holds a basic degree of DVM, master's in animal Reproduction and worked as an Assistant Professor of clinical sciences in the Faculty of Veterinary Sciences, BZ University, Pakistan. His research focused on two main areas: Pregnancy/endocrinology and parasitic infections. In the Lamberton lab, he is assisting to conduct a population genetic analysis on S. mansoni larvae collected from the infected individuals. Before PhD, Dr. Arshad research relied heavily on classical biochemical and endocrinological techniques. However, biochemistry has been recently revolutionized by the invention of modern liquid chromatography mass spectrometry (LCMS) that allows a holistic view of hundreds to thousands of chemicals in biological samples, often termed metabolites. During his PhD, he made the switch and learned the use of this technology which required additional skill sets such as handling large datasets and using complex computer 'pipelines' to gain insight into how these metabolites relate to and interact with each other during various infections. Owing to his multidisciplinary experience, he intends to further extend his skills in metabolomics. In the long run, he aims to use his metabolomics expertise to identify morbidity biomarkers of Schistosomiasis by designing a project in line with the future directions of the Lamberton lab. In his spare time, he likes to learn some acting techniques and he has already done character acting in a short movie by the GMAC film production company, Scotland.

Title

Metabolomic profiling of the maternal foetal interface and the developing foetus during toxoplasma gondii infection.

Abstract

T. gondii infection during pregnancy can cause abortion or congenital disease. Events in the maternal-foetal interface, where immunological changes occur, are critical in determining the pregnancy outcome. Several studies cover the serum biochemical/metabolic changes following *T. gondii* infection, but limited information

exists concerning changes to the placental metabolome or the foetus while in utero. For the first time, this study covers the metabolomic profile and potential underlying mechanisms in the maternal-foetal interface, the developing foetus and maternal serum in BALB/c mice in a *T. gondii* congenital infection model. Results demonstrate the highest number of metabolite changes in the maternal serum, however a subset of these changes to tryptophan degradation pathway, arginine metabolic pathway was also found in the maternal-foetal interface and the developing foetus. In addition, some metabolites from microbiome origin including indoxylsulfate and 4-guanidinobutanoate were changed compared with the controls, suggesting the potential of *T. gondii* to change the host microbiome. However, preliminary metagenomics analysis did not demonstrate such changes, albeit in a different model of *T. gondii* infection. Comparison of alterations of metabolites between the developing foetus and the brain from adult mice born to infected mothers was carried out to determine whether the changes observed in early foetal life were still evident in later life. The most significant finding of this study is that increased kynurenine levels are found in early foetal life. This metabolite was found to be increased in the brains of adult mice with congenital *T. gondii* infection, but not in uninfected litter mates exposed to maternal-immune activation. This suggests that raised kynurenine levels in foetuses in utero might be maternally derived and short lived, but ultimately endogenously produced in congenitally infected mice. This metabolite has been implicated in psychoneurological diseases, but the consequences of kynurenine exposure in these circumstances remain to be determined.

Ass. Prof. Ahmed I. Elbarbary

Head of Cardiology Department in Faculty of Medicine & Souad Kafafi University Hospital, Misr University for Science and Technology (MUST), Egypt.

Biography

Ahmed I. Elbarbary is Associate Professor and Head of Cardiology Department in Faculty of Medicine and Souad Kafafi University Hospital, Misr University for Science and Technology (MUST), Egypt.
Vice President of Cardiac Medical Therapy Working Group of the Egyptian Society of Cardiology.
Member of the European Society of Cardiology. Member of the Egyptian Society of Cardiology.
X- Director of Cardiology Department -MUST University. X- Vice President of valvular working group of the Egyptian Society of Cardiology.

Title

2023- ESH Guidelines for the Management of Arterial Hypertension

Abstract

Clinical practice guidelines are ideally suited to the provision of advice on the prevention, diagnosis, evaluation, and management of high blood pressure (BP). The recently published European Society of Hypertension (ESH) 2023 ESH Guidelines for the management of arterial hypertension is the latest in a long series of high BP clinical practice guidelines. It closely resembles the 2018 European Society of Cardiology/ESH guidelines, with incremental rather than major changes. Although the ESH guidelines are primarily written for European clinicians and public health workers, there is a high degree of concordance between its recommendations and those in the other major BP guidelines. Despite the large number of national and international BP guidelines around the world, general population surveys demonstrate that BP guidelines are not being well implemented in any part of the world. The level of BP, which is the basis for diagnosis and management, continues to be poorly measured in routine clinical practice and control of hypertension remains sub-optimal, even to a conservative blood pressure target such as a systolic/diastolic BP <140/90 mm Hg. BP guidelines need to focus much more on implementation of recommendations for accurate diagnosis and strategies for improved control in those being treated for hypertension. An evolving body of implementation science can assist in meeting this goal. Given the enormous health, social, and financial burden of high BP better diagnosis and management should be an imperative for clinicians, government, and others responsible for the provision of healthcare services. Hopefully, the 2023 ESH will help enable this.

Workshops

WORKSHOP I

Magnetite nanoparticles Preparation, Characterization and applications

Target audience with specialties:

• Academic researchers

•Postgraduate research students.

The workshop will discuss:

- The origin of superparamagnetic behaviour.
- Massart method for magnetite superparamagnetic nanoparticles preparation (Optional practical session).
- Modification of magnetite nanoparticles surface.
- Required characterization tests and their interpretation.
- " Applications of magnetite nanoparticles in research." It is optional according to the available facilities to deliver the workshop either practically or by Video illustrations.

Workshop Lecturer

Dr. Hatem Ibrahim Hassan Mokhtar

PhD, Pharmaceutical Sciences (Analytical Chemistry), 2020 Lecturer of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Sinai University.

Biography

Dr. Hatem Ibrahim Mokhtar, PhD; is a former manager of Analytical Research and Development in Medical union Pharmaceuticals (MUP) Co. - R&D department. He had more than 15 years of experience in the field of analytical research, method development, validation and stability testing. He participated in many research projects for pharmaceutical products development, optimization and troubleshooting. He obtained PhD of analytical chemistry in faculty of pharmacy, Suez Canal University in 2020. Now he is a lecturer of pharmaceutical analytical chemistry in faculty of pharmacy, Sinai University. His research interests include, HPLC computer aided method development and optimization, application of Quality by Design concepts in analysis, preparation and characterization of different types of nanomaterials and microextraction techniques. His publications include in analytical chemistry articles as well as multidisciplinary research articles.

WORKSHOP II

Know strategy fight allergy (Risk management of drug allergy) tools and implementation

Target audience with specialties: graduate, undergraduate.

Topics to be covered by the workshop:

- pharmacovigilance Scope & tools.
- Counterfeit prevention.
- Pharmacovigilance History and awareness.
- Drug safety.

Workshop Lecturers

Dr. Islam Usama

Pharmacovigilance manager, QPPV.

Biography:

Pharmacovigilance manager, Global Qualified Person for Pharmacovigilance (QPPV), 20 years of experience in the pharmaceutical field.

Dr. Gehan El-Hefny

Medical affairs General manager at MUP.

Biography: ISOP Egypt Chapter board member ESPEN Diploma in clinical nutrition (European society of enteral and parenteral nutrition). Clinical nutrition specialist registry in Egyptian Medical syndicate 2012. Certified trainer TOT from Missouri University USA IBDL "International Business Driving license" certificate from Missouri University USA. Pharmacovigilance certificate from North Carolina University USA. MBBCh, Ain Shams University 1998.

WORKSHOP III

Designing More Efficient and Effective Experiments for Researchers

Target audience with specialties:

Pharmaceutics, Pharmaceutical Analytical Chemistry, Formulators and experimenters from different specialties.

Topics to be covered by the workshop:

- Implement the DOE planning process.
- Understand the motivation for factorial designs.
- Interpret analysis of variance (ANOVA).
- Discover hidden interactions.
- Capitalize on efficient small-run fractional designs for screening or characterization.
- Use power to properly size designs.

1. Follow the strategy of experimentation from screening to response surface methods
2. Set up central composite (CCD) and optimal designs.
3. Select appropriate regression models with model reduction
4. Optimize multiple responses."

Workshop Lecturer

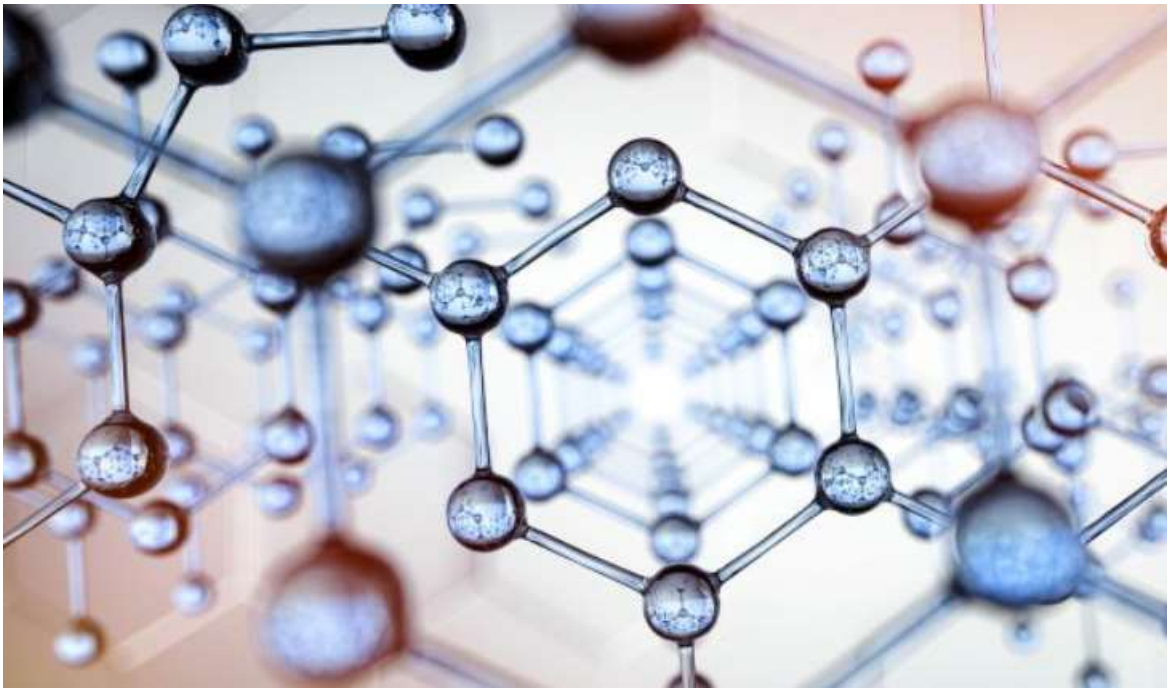
Dr. Mahmoud Medhat Ibrahim Elkhoudary

Associate professor of pharmaceutical analytical chemistry – Faculty of pharmacy – Galala University
Mobile: +2 111 0777 922
Date of birth: November5th, 1987. Marital status: Married.

Education: Ph.D. degree in Pharmaceutical Sciences (Analytical chemistry) - Suez Canal University. September 2017 master's degree in Pharmaceutical Sciences (Analytical chemistry) - Suez Canal University.

July 2011- May 2014 B.Sc. in Pharmaceutical sciences at Faculty of Pharmacy – Cairo University with the Grade Excellent with honor.

POSTER ABSTRACTS



DAY 1

POSTGRADUATES POSTERS

Topic	Code
Pharmaceutical Analytical Chemistry	PA
Biochemistry	PB
Pharmaceutical Chemistry	PC
Pharmacognosy	PG
Industrial Pharmacy	PI
Pharmacology and Toxicology	PL
Microbiology and Immunology	PM
Pharmaceutical Organic Chemistry	PO
Clinical Pharmacy Practice	PP
Pharmaceutics	PT

Pharmaceutical Analytical Chemistry

PA-01

Stability-Indicating Chromatographic Methods for the Simultaneous Determination of Probenecid and Colchicine in their Combined Tablet

Mahmoud A. Tantawy[1], **Israa A. Wahba [2]**, Samah S. Saad [2], Nesrin K. Ramadan [1]

[1] *Analytical Chemistry Department, Faculty of Pharmacy, Cairo University, Kasr el Aini Street, 11562, Cairo, Egypt.*

[2] *Pharmaceutical Analytical Chemistry Department, College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science & Technology, 6th of October City, Giza, Egypt.*

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Background: Two stability-indicating chromatographic methods have been established and validated for concurrent determination of probenecid (PRO), colchicine (COL)along with the degradation product of colchicine (COL deg).

Methods: PRO and COL were exposed to a stress stability study which includes acidic, alkaline, oxidative, photolytic, and thermal degradations. Chromatographic methods included the use of thin layer chromatography (TLC-densitometry) and High-Performance Liquid Chromatography (HPLC). In the first method, separation was achieved using TLC plates precoated with silica gel $G.F_{254}$ and ethyl acetate-methanol-33%ammonia (8:1:1, by volume) as a mobile phase. The chromatograms were scanned at 254 nm. The second method was based on HPLC using a RP- C18 column and a mobile phase comprised of phosphate buffer pH 5–acetonitrile (70:30, v/v) at a flow rate of 1.0 $mLmin^{-1}$ and UV detection at 254 nm.

Results: The stability study reveals that PRO was stable to all stress degradation conditions whereas COL is only labile to acidic and alkaline degradations conditions giving rise to one degradation product. Detection of degradation product was confirmed by subjecting COL deg to IR and mass analysis. The adopted methods have the advantage of being applicable for determination of the two cited drugs in the presence of COL deg.

Conclusion: The suggested methods are applicable in quality control laboratories as stability-indicating ones for simultaneous analysis of PRO and COL in the presence of their probable degradation products. The proposed methods could be applied for the routine analysis of the studied drug in pure bulk powder and its dosage form.

PA-02

A Reliable Electrochemical Sensor Based on Functionalized Magnetite Nanoparticles for Over-the-counter Allergy Medication Abuse Sensing in Biological Fluids

Hoda M. Marzouk*[1], **Engy A. Ibrahim**[2], Maha A. Hegazy [1], and Samah S. Saad[2]

[1] Analytical Chemistry Department, Faculty of Pharmacy, Cairo University, Cairo, Egypt

[2] Pharmaceutical Analytical Chemistry Department, College of Pharmaceutical Sciences and Drug Manufacturing, Misr University for Science & Technology, 6th of October City, Giza, Egypt

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Background: Diphenhydramine (DIPH) has become one of the world's most widely abused over-the-counter medications. In addition to relieving allergy symptoms, it is also recognized for causing elevated energy and mild euphoric effects. The U.S. Food and Drug Administration (FDA) has recently warned about serious problems at high doses including heart problems, seizures, coma or even death among addicted teenagers.

Methods: Herein, a nanocomposite based electrochemical sensor was designed for DIPH quantification in biological fluids. Introducing the functionalized Fe_3O_4 nanoparticles (NPs) into the inner-filling solution and the PVC-based ion sensing membrane has been employed and compared to the classical potentiometric approach.

Results: The nanoparticles were incorporated to endorse in situ cooperative ion-pairing interaction between the ionophore and DIPH, and to improve the selectivity and detection limit (9.5×10^{-8} M). Nernstian potentiometric response was achieved for DIPH over the concentration range of 1.0×10^{-7} to 1.0×10^{-2} M with a slope of 59.0±0.2 mV/decade. Inherent merits of the proposed sensor include fast response time (6 s), superior stability (60 days) with higher sensitivity and selectivity towards DIPH without interference from co-formulated drugs and several ions commonly found in biological matrices. The proposed sensor was successfully applied to the potentiometric determination of DIPH in different biological fluids (plasma and human milk) with an average recovery of 99.06±1.95 % and 100.34±1.92 %, respectively.

Conclusion: The proposed sensor responds selectively to DIPH enabling its sensitive sensing in biological fluids, as well as in complex pharmaceutical formulation. Furthermore, the proposed method's low cost, direct, time saving, real-time analytical properties allowed it to be used as a better eco-friendly alternative for drug abuse testing.

Selective Determination of Nicorandil with a Single Planar Solid-state Potentiometric Ion Selective Electrode

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Background: Novel screen-printed electrodes (SPEs) were constructed for the quantitation of nicorandil (NIC) in its pharmaceutical formulations.

Methods: Different ion-exchangers and plasticizers were investigated, but the optimal potentiometric response was obtained using nicorandil- phosphotungstate (NIC-PTA) ion associate and tricresyl phosphate as a plasticizer.

Results: A Nernstian response of 58.80 ± 1 mV/decade was obtained over a concentration range of 1×10^{-6} - 1×10^{-2} M with 1×10^{-5} M as a detection limit. Sensor morphology was characterized using scanning electron microscopy (SEM). The method was validated for the assay of NIC with high selectivity, accuracy (average recovery=100.54%), and precision (% RSD≤2).

Conclusion: The proposed method is simple, economic, rapid, and selective for the determination of NIC in the pharmaceutical formulations without interference.

PA-04

Developing new routes for functionalizing gold nanorods with DNA to perform single nanoparticle imaging bioaffinity sensing

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Background: Gold nanorods (NRs) have attracted a great deal of interest for a variety of biomedical and sensing applications. This is due to their highly tuneable optical properties in combination with high-yield approaches for their synthesis enabling their localized surface plasmon resonance (LSPR) to be controlled over a wide visible-NIR range. However, developing robust methods for biofunctionalizing nanorods has continued to be a challenge due to the initial presence of a surface bilayer of the surfactant, cetyl trimethylammonium bromide (CTAB), which has an essential role in the anisotropic particle growth. In particular, compared to proteins (*e.g.* antibodies, peptides), there have been very few reports in the literature of the controlled coupling of single-stranded DNA onto the surface of a colloidal suspension of nanorods that don't involve thiol chemistry or basic electrostatic interactions.

Methods: We have used set of extinction measurements to ensure the stability of the produced substrates, fluorescence measurements to ensure the success and bioactivity of the developed conjugates besides correlated dark field and fluorescence images. In this poster, we will highlight our efforts to explore new options for the surface attachment of bioactive DNA and to verify this at the single nanoparticle level.

Results: Achieving this opens up the possibility of incorporating nanorods into a variety of bioaffinity sensing and imaging applications for both nucleic acid and protein detection incorporating into sandwich assays and via aptamer-protein interactions.

Conclusion: The subsequent applications of these nanotags for ultrasensitive detection and single particle tracking will be challenging.

PA-05

Sustainable liquid chromatographic determination and purity assessment of a possible add-on triple-action over-the-counter pharmaceutical combination in COVID-19

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Background: Nowadays, all researchers are focused on combating the pandemic COVID-19. According to recent statistics, most patients are managed at home. An over-the-counter (OTC) triple action formula containing paracetamol (PAR), aspirin (ASP), and diphenhydramine (DIPH) is widely prescribed for pain, fever and as night-time sleep aid. For COVID-19 patients, this combination is now suggested as part of symptomatic therapy and prophylaxis.

Methods: In this work, two simple liquid chromatographic approaches were designed for simultaneous determination of PAR, ASP, and DIPH in Excedrin® PM caplets, beside three specified official toxic impurities, namely, *p*-aminophenol, *p*-nitrophenol, and salicylic acid. The first method comprised high-performance thin-layer chromatographic separation coupled with densitometric quantification, on silica gel HPTLC 60 F_{254} aluminium sheets as the stationary phase. The second one is a high-performance liquid chromatography coupled with diode array detector. Successful separation of the six components was performed on XTerra C_{18} column with isocratic elution of mobile phase.

Results: Both methods were successfully used for quality control of the cited drugs in their marketed formulation.

Conclusion: Sustainable chromatographic methods were developed and validated for separation and estimation of the three cited drugs together with three of their potential official impurities. The greenness profile was evaluated via four common assessment metrics; analytical eco-scale system, NEMI, GAPI and AGREE tools. Additionally, in-vitro dissolution profiles were successfully monitored for the cited drugs from caplet dosage form using the proposed HPLC method. The proposed methods' capacity to detect trace quantities of potential impurities also makes it a good choice for impurity profiling of the cited pharmaceutical formulation.

PA-06

Selective Determination of Entecavir in the Presence of its Oxidative Degradate by Spectrophotometric and Chromatographic Methods

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Background: Entecavir (ENT) is an antiretroviral agent prescribed for the treatment of the hepatitis B virus (HBV) and human immunodeficiency virus (HIV). Development and validation of three simple, sensitive, selective, and precise methods for determination of ENT in the presence of its oxidative degradation product (ENT deg.).

Method: The first method was based on second derivative (D2) spectrophotometry through measuring the peak amplitude of D2 spectra at 293.6 nm. The second one is mean centering of the ratio spectra (MCR), which enabled measurement of the peak amplitude at 280.0 nm. The third method was HPLC, where ENT was separated from ENT deg. using a Zobrax C18 column and methanol: water (30:70, v/v) with pH 3 as a mobile phase. The three developed methods were validated according to the International Conference on Harmonization guidelines.

Results: Linearity range of ENT was 5.00-50.00 µg/mL for both D2 and MCR. However, higher sensitivity was achieved using HPLC (1.00-50.00 µg/mL). Accuracy of ENT were 100.60 ± 0.547%, 101.55 ± 1.2071%, and 100.61 ± 1.207% for D2, MCR, and HPLC methods, respectively, and precision was within 1.280.

Conclusions: The developed methods were successfully applied for the determination of ENT in Tecavir® tablets without interference from ENT deg. They showed no significant difference in comparison with the official method, and they can be applied in the quality analysis of ENT with high selectivity, accuracy, and precision. ENT was quantified using two spectrophotometric (D2 and MCR) methods and an HPLC method in presence of ENT deg. The proposed methods were applied to analysis of ENT tablets with high selectivity, sensitivity, and accuracy.

PA-07

Two Validated Chromatographic Methods for Determination Of Ciprofloxacin HCl, One of Its Specified Impurities and Fluocinolone Acetonide in Newly Approved Otic Solution

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Background: Two sensitive, selective, and precise chromatographic methods have been established for concomitant quantification of ciprofloxacin HCl (CIP), fluocinolone acetonide (FLU) along with ciprofloxacin impurity A (CIP-imp A).

Methods: The first method was thin layer chromatography (TLC-densitometry), separation was accomplished using TLC silica plates 60 $G.F_{254}$ as a stationary phase and chloroform-methanol-33%ammonia (4.6:4.4:1, by volume) as a developing system. The second method was based on High-Performance Liquid Chromatography (HPLC) using a Zorbax ODS column (5 um, 150×4.6 mm i.d.) where adequate separation was achieved through a mobile phase composed of phosphate buffer pH 3.6–acetonitrile (45:55, v/v) at flow rate 1.0 mL min^{-1} with ultraviolet detection at 254 nm.

Results: Two novel chromatographic methods, TLC-densitometry and HPLC were developed for the simultaneous determination of CIP, FLU and CIP-imp A in their newly released pharmaceutical otic solution.

Conclusion: The two proposed methods were validated as per ICH guidelines. They were also exploited by their applicability not only for assaying the two drugs in their challengeable dosage form ratio but also for determination of ciprofloxacin impurity A, as one of specified ciprofloxacin impurities.

Biochemistry

PB-01

Epigenetic Inactivation of DNA repair genes *RBBP8* and *MSH4* as Prognostic and Predictive Biomarkers for Enhanced Chemotherapy Response in Urothelial Bladder Cancer

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Background. The current lack of reliable prognostic biomarkers makes it challenging to identify UBC patients who would benefit from chemotherapy. This study aimed to investigate epigenetic inactivation of DNA damage repair (DDR) genes as prognostic and predictive biomarkers for urothelial bladder cancer (UBC).

Methods. We analyzed the genome-wide DNA methylome of 374 primary tumors and 37 normal tissues from the TCGA-BLCA dataset, focusing on 154 DDR genes. We validated the two most significant differentially methylated genes, Retinoblastoma binding protein 8 (RBBP8) and MutS homologue 4 (MSH4), between primary tumors and normal tissues of TCGA-BLCA by performing methylation-specific PCR (MSP) on UBC (n = 70) versus normal tissues (n = 30). The expression levels of *RBBP8* and *MSH4* were measured using qRT-PCR. We developed a predictive model for therapeutic response by combining *RBBP8* and *MSH4* methylation status with clinical features of the patients. Furthermore, the prognostic significance of RBBP8 and MSH4 was assessed.

Results. Promoter methylation and downregulation of *RBBP8* and *MSH4* were significantly associated with the muscle-invasive phenotype of UBC, prolonged progression-free survival (PFS), and increased susceptibility to cisplatin chemotherapy. *RBBP8* and *MSH4* methylation were positively correlated with each other and with respective their gene repression. A machine-learning model accurately predicted UBC patients' response to cisplatin-based chemotherapy with 90.05% accuracy.

Conclusion. Epigenetic inactivation of *RBBP8* and *MSH4* sensitizes UBC patients to DNA-damaging agents. The combination of clinical features and *RBBP8*- and *MSH4*-methylation in a machine-learning model shows promise for stratifying UBC responders from non-responders to chemotherapy.

PB-02

In Silico Identification and Clinical Validation of a Novel Long Non-Coding RNA/mRNA/miRNA Molecular Network for Potential Biomarkers for Discriminating SARS CoV-2 Infection Severity

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Background: The coronavirus (COVID-19) pandemic is still a major global health problem, despite the development of several vaccines and diagnostic assays. Moreover, the broad symptoms, from none to severe pneumonia, and the various responses to vaccines and the assays, make infection control challenging. Therefore, there is an urgent need to develop non-invasive biomarkers to quickly determine the infection severity. Circulating RNAs have been proven to be potential biomarkers for a variety of diseases, including infectious ones. This study aimed to develop a genetic network related to cytokines, with clinical validation for early infection severity prediction.
Methods: Extensive analyses of in silico data have established a novel IL11RA molecular network (IL11RNA mRNA, LncRNAs RP11-773H22.4 and hsa-miR-4257). We used different databases to confirm its validity. The differential expression within the retrieved network was clinically validated using quantitative RT-PCR, along with routine assessment diagnostic markers (CRP, LDH, D-dimmer, procalcitonin, Ferritin), in100 infected subjects (mild and severe cases) and 100 healthy volunteers.
Results: IL11RNA mRNA and LncRNA RP11-773H22.4, and the IL11RA protein, were significantly upregulated, and there was concomitant downregulation of hsa-miR-4257, in infected patients, compared to the healthy controls, in concordance with the infection severity. **Conclusion:** The in-silico data and clinical validation led to the identification of a potential RNA/protein signature network for novel predictive biomarkers, which is in agreement with ferritin and procalcitonin for determination of COVID-19 severity.

PB-03

Hepatic ABCC10 and SLC17A5 Drug Transporters in a Hypercholesterolemic Rat Model

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Introduction: The liver x receptor a (LXRa) is a nuclear receptor superfamily ligand-activated transcription factor. The most powerful endogenous LXRa-agonists are oxysterols (endogenous oxidized cholesterol derivatives). LXRa affects various drug transporter superfamilies, including ATP-binding cassette (ABC) and solute linked carrier (SLC).

Methodology: 48 male rats were divided randomly into four groups (n ¼ 12); control group rats received vehicle; hypercholesterolemic group (HCH group) rats received diet contain 2.5% cholesterol & deoxycholic acid for 8 weeks; (LXRa group) rats were fed standard pellet chow for 8 weeks, then a single dose of LXRa was administered (IP) at a dose of 10 mg/kg; (HCH þ LXRa group) rats received diet contain 2.5% cholesterol &deoxycholic acid for 8 weeks, then a single dose of LXRa was administered (IP) at a dose of 10 mg/kg.

Results: hypercholesterolemia and LXRa significantly activated LXRa to varying degrees in both hepatic and cardiac tissues with subsequent alteration of LXRa and ABCC10 gene expression. Whereas, SLC17A5 gene expression was primarily affected by elevated serum cholesterol level and unmediated via LXRa-activation.

Conclusion: ABCC10 is a specific LXRa-target gene and that LXRa autoregulates its own expression in rats.

Pharmaceutical Chemistry

PC-01

In Silico and Biological Evaluation of Novel Fused Pyrimidine Derivatives as CDK2 Inhibitors and Apoptosis Inducers

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Background: Quinazolinone is a promising class of fused heterocyclic pyrimidine scaffold that exhibits broad biological activities.

Methods: In the present work new sets of 2,3-disubstituted quinazolin-4(3*H*)-one derivatives were designed, synthesized, and screened for their cytotoxic activity against a panel of sixty cancer cell lines. Moreover, cell cycle analysis and annexin V-FITC staining were done. Finally, CDK2 enzyme inhibition assay was performed.

Results: This screening indicated that compounds **4c**, **6a**, **6b**, **6d**, and **6g** revealed promising cytotoxicity with significant GI% in the range of 81.98 - 96.45% against different cell lines (CNS, melanoma, and non- small cell lung cancer). The *in-vitro* cytotoxic IC_{50} values for the most potent compounds **4c**, **6a**, **6b**, **6d**, and **6g** against most active cell lines were tested. Regarding non-small cell lung cancer, compound **6g** revealed excellent decrease in IC_{50} = 1.84 µM relative to reference drug Roscovitine (IC_{50} = 7.68 µM). While compound **6a**, **6b**, and **6d** showed significant IC_{50} = 2.6, 2.3 and 1.8µM, respectively compared to Roscovitine (IC_{50} = 4.08µM) for CNS cancer. CDK2 enzyme inhibition assay showed that compound **6b** was the most potent one with IC_{50} = 0.67 µM relative to Roscovitine (IC_{50} = 0.64 µM). They have also arrested the cell cycle at G1, S phases or both lead to cell death and induced apoptosis. The resulting outcomes were much explained by the molecular docking study for the most active compounds into CDK2 active site.

Conclusion: According to the obtained results, the newly designed compounds are regarded as promising scaffolds for the continued development of novel CDK2 inhibitors.

PC-02

Discovery of New Quinazolin-4(3*H*)-ones Possessing Promising Antiproliferative Activities *via* CDK2 inhibition, Cell Cycle Arrest and Apoptosis

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Background: Cancer rapidly emerges to be the principal cause of death worldwide. Cyclin-dependent kinase 2 (CDK2) performs a critical role in controlling various events of the cell cycle such as DNA repair, gene transcription, G1-S transition, and modulation of G2 progression. Thus, CDK2 inhibition may confer a therapeutic benefit against many cancers. In this investigation, three series of quinazolin-4(*3H*)-one derivatives were developed as CDK2 inhibitors.

Methods: The structures of the newly synthesized compounds have been confirmed using analytical and spectral data. A panel of sixty cancer cell lines was used to test all the new chemotypes for their ability to inhibit cancer cell growth.

Results: The quinazolinones **5c** and **8a** showed excellent antiproliferative activity against the melanoma cell line MDA-MB-435 with GI% of 94.53 and 94.15, respectively. Cell cycle analysis showed that compound **5c** led to cell cycle cessation in the S phase in MDA-MB-435 cells and in the G2/M phase in SNB-75 cells signifying that CDK2 could be the plausible biological target. Thus, the most cytotoxic counterparts **5c** and **8a** were evaluated *in vitro* for their CDK2 inhibitory activity and were able to exhibit noteworthy activity. Furthermore, compound **5c** induced apoptosis in MDA-MB-435 (28.65%) and SNB-75 (44.22%) cell lines. The molecular docking study affirmed the attained results by demonstrating the ability of **5c** to form a pair of crucial hydrogen bonds with the CDK2 hinge region (Leu83 and Glu81).

Conclusion: These outcomes endorse a rationale for further development and optimization of novel antiproliferative congeners acting *via* CDK2 inhibition.

PC-03

A Quantum Mechanical Study of Preferability of Molnupiravir, an Anti-COVID-19 Drug, towards Purine Nucleosides

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Background*:* Structural aspects of molnupiravir complexed with the RNA of the SARS-CoV-2 virus have been recently resolved inside the RNA-dependent RNA polymerase (RdRp), demonstrating the interactions of molnupiravir with purine nucleosides. However, the preference of molnupiravir to interact with one purine nucleoside over another has not been cleary investigated.

Methods*:* Herein, the complexation of molnupiravir in its active form with guanosine and adenosine was compared, using sundry DFT calculations. The plausible tautomeric structures of molnupiravir drug in complex with guanosine/adenosine were minutely scrutinized.

Results: The relative energy findings outlined the favorability of amino-molnupiravir···keto-amino-guanosine and imino-molnupiravir···amino-adenosine optimized complexes. According to the interaction (E_{int}) and binding (E_{bind}l values of –31.16/–21.81 and –13.93/–12.83 kcal/mol, respectively. This could be interpreted by the presence of three and two hydrogen bonds within the former and latter complexes, respectively. Observable changes in the electronic properties and global indices of reactivity of the studied complexes also confirmed the preferential binding within the studied complexes. The findings from the quantum theory of atoms in molecules and the noncovalent interaction index also support the partially covalent nature of the investigated interactions. For both complexes, changes in thermodynamic parameters outlined the spontaneous, exothermic, and nonrandom states of the inspected interactions. Inspecting the solvent effect on the studied interactions outlined more observable amelioration within the water medium compared with the gas one.

Conclusion*:* These results would be durable grounds for the forthcoming studies concerned with the interactions of the molnupiravir drug with purine nucleosides.

PC-04

Design and Synthesis of Some Furan, Furopyrimidine and Furotriazolopyrimidine Derivatives as Braf Kinase Inhibitor

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Background: Novel furan and furopyrimidine derivatives have recently been reported for their potential antitumor activity through various mechanisms of action.

Methods: Novel series of substituted furan **(7b-d, 8b-d)**, furo[2,3-d]pyrimidine **(14a-d)**, and furo[3,2-e][1,2,4] triazolo[1,5-c]pyrimidine **(15a-d)** were synthesized and evaluated for their in vitro anticancer activity in the full NCI 60 cell lines panel assay.

Results: Six compounds showed promising growth inhibitory activity (55.73-174.62%). Compound **8d** displayed the highest growth inhibitory activity toward numerous cell lines with a superior growth inhibitory activity (174.62%) against LOXIMVI melanoma cell line in which BRAF kinase is highly expressed.

Conclusion: compound **8d** was further screened for BRAF kinase inhibitory activity and revealed IC_{50}=47.61 ng/ml compared to vemurafenib (IC_{50}= 18.41ng/ml). Interestingly, in vitro cytotoxicity of **8d** against LOXIMVI cells showed comparable IC_{50}=10.19 ug/ml with vemurafenib (IC_{50}= 5.44 ug/ml). Furthermore, the cell cycle analysis of **8d** at LOXIMVI cells revealed cell cycle arrest at pre-G1 and S phases. The flow cytometry analysis showed that **8d** induced apoptosis and necrosis on LOXIMVI cells with significant higher percentage than the control.

PC-05

In-Silico Mining of the NPAtlas Database Towards Hunting Prospective Candidates as SIRT2 Inhibitors: Database Mining, Molecular Dynamics, and Binding Energy Computations

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Background: Sirtuin 2 (SIRT2) is a member of the sirtuin protein family, which includes lysine deacylases that are NAD^+-dependent and organize several biological processes. Different forms of cancer have been associated with dysregulation of SIRT2 activity. Hence, identifying potent inhibitors for SIRT2 has piqued considerable attention in the drug discovery community.

Methods: In the current study, the Natural Products Atlas (NPAtlas) database was mined to hunt potential SIRT2 inhibitors utilizing in silico techniques. Initially, the performance of the employed docking protocol to anticipate ligand-SIRT2 binding mode was assessed according to the accessible experimental data. Based on the predicted docking scores, the most promising NPAtlas molecules were selected and submitted to molecular dynamics (MD) simulations, followed by binding energy computations.

Results: Based on the MM-GBSA binding energy estimations over a 200 ns MD course, three NPAtlas compounds, namely NPA009578, NPA006805, and NPA001884, were identified with better $\Delta G_{binding}$ towards SIRT2 protein than the native ligand (SirReal2) with values of −59.9, −57.4, −53.5, and −49.7 kcal/mol, respectively. On the basis of structural and energetic assessments, the identified NPAtlas compounds were confirmed to be steady over a 200 ns MD course. The drug-likeness and pharmacokinetic characteristics of the identified NPAtlas molecules were anticipated, and robust bioavailability was predicted.

Conclusion: The current results propose potent inhibitors for SIRT2 deserving more *in vitro/in vivo* investigation.

PC-06

In Silico Evaluation of Prospective Nucleotide-based Drugs as Potential RNA-Blockers: Molecular Dynamics and Quantum Mechanics Study

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Introduction*:* Based on WHO (World Health Organization), COVID-19 is in charge of more than 6.9 million deaths and 767 million confirmed cases. Although the present vaccination momentum, thousands of cases die every day from COVID-19 disease. The RdRp (RNA-dependent RNA polymerase) enzyme plays a vital function in viral replication. Remdesivir is the first antiviral drug authorized by the FDA for COVID-19 medication for contingency utilization, inhibiting RNA of SARS-CoV-2 RdRp enzyme. Nucleotide analogs have enticed great attention as alternative sources of antiviral drug candidates.

Methods*:* In this work, eleven investigational and FDA-approved nucleotide analogs were scrutinized as prospective RNA inhibitors using molecular dynamics (MD) simulations over 100 ns. The corresponding binding energy computations were estimated utilizing the MM-GBSA approach. Additionally, MD simulations over 100 ns were executed for the nucleotide analogs complexed with RNA in the presence of RdRp enzyme to study the impact of the presence of enzyme. To confirm the MD data, quantum mechanics calculations were performed.

Results*:* According to binding energy computations, molnupiravir, sofosbuvir, and zalcitabine with guanosine exposed promising binding affinity with $\Delta G_{\text{binding}}$ values of −62.0, −55.0, and −65.6 kcal/mol, respectively. As well, stavudine with adenosine and entecavir with cytidine also demonstrated superior binding affinities with $\Delta G_{\text{binding}}$ values of −61.3 and −54.5 kcal/mol, respectively, compared to remdesivir with uridine (calc. −60.3 kcal/mol). Furthermore, these nucleotide analogs complexed with RNA demonstrated high stability over the MD course.

Conclusion*:* Consequently, the identified nucleotide analogs are promising RNA blockers and deserve further experimental assays.

PC-07

In-Silico Targeting Spike Glycoprotein RBD Domain of SARS-CoV-2 by Bioactive Peptides from Shrimp: AlphaFold Modelling, Molecular Docking, and Molecular Dynamics Simulations

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Background*:* The universe is under the toll of the COVID-19 epidemic originating from SARS-CoV-2 virus. The deficiency of efficient drugs has compressed the scientific society for exploring novel drugs able to alleviate and stop this outbreak. Receptor-binding domain (RBD) is a charming druggable target for exploring curative drug candidates because of its vital role in virus binding, fusion, and entry into the host cell.

Methods*:* In the current study, shrimp bioactive peptides retrieved from the BioPep database were selected and predicted using AlphaFold2 software as prospective RBD inhibitors. Notably, the investigated peptides were virtually screened based on the sequence length. Only sequences ranging from 5 to 35 amino acids were selected. All molecular docking computations were conducted using the HADDOCKv2.4 server. The performance of the utilized docking software was first validated to anticipate peptide-BRD4 binding mode on the basis of the available experimental data. According to docking poses, the most potent peptides were subjected to MD simulations over 200 ns, followed by binding energy estimation using the MM-GBSA approach.

Results: Based on binding energy computations, biopep03200, biopep04066, and biopep03361 showed a superior binding affinity against the RBD domain with $\Delta G_{binding}$ values of –70.8, –53.1, and –49.5 kcal/mol, respectively, compared to ACE2 (21:53 AA; calc. –45.8 kcal/mol). According to post-MD analyses, the identified peptides were assured to be stationary throughout MD simulations.
Conclusion*:* Conclusively, these findings suggested that the identified peptides are promising BRD inhibitors and warrant further investigations as anti-COVID-19 drug candidates.

PC-08

Coumarin-acetohydrazide derivatives as novel Antiproliferative agents via VEGFR-2/AKT axis inhibition and apoptosis triggering

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Background: Tumor cell survival is a very complicated process involving. sustaining proliferation, angiogenesis, evading apoptosis, developing resistance towards chemotherapy, and many other mechanisms. One of the major players known to critically control apoptosis is the enzyme AKT/PKB. One of the essential growth factors affecting the AKT pathway is the VEGFR superfamily, a key player in angiogenesis.
Also, the VEGFR-2/AKT pathway is a crucial axis in tumor survival where it is highly dysregulated in many cancer types.
Method: To develop a promising anticancer therapy inhibiting the significant signal transduction axis of VEGFR-2/AKT, novel small molecules were designed to have the naturally abundant coumarin ring. These molecules were designed based on a comprehensive study of the reported essential binding features for VEGFR-2/AKT-1inhibition. These novel coumarin-acid hydrazides were synthesized and assayed for their anticancer activity in MCF-7 and Panc-1 cells via MTT assay. Afterwards, elucidation of the mechanism of action of the most active entities were carried out where their IC50 values were determined against VEGFR-2/AKT-1 proteins and these findings were assisted by docking simulation. Finally, apoptosis triggering was evaluated.
Results: The MTT assay of most compounds, especially **4f** and **4k** showed promising antiproliferative activity with an IC50 of 0.73, 1.19 and 0.84, 3.61 mM against both cell lines, respectively. Their inhibitory activity on VEGFR-2/AKT-1 proteins was very promising with IC50 values of 0.18 and 0.12 mM onVEGFR-2and 5.7 and 8.1 mM on AKT by **4f** and **4k**, respectively. Also, flow cytometry revealed cell cycle arrest with elevated caspase 8 and 9 levels leading to apoptosis by both compounds. Furthermore, docking studies revealed binding patterns similar to the reference ligands in VEGFR-2 and AKT-1 binding sites.
Conclusion: These novel coumarin derivatives are promising anticancer leads via inhibiting theVEGFR-2/AKT axis and apoptosis induction.

Pharmacognosy

PG-01

Activation of the Cryptic Secondary Metabolite Gene Clusters in The Actinomycete Genome

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Background: Actinomycetes are well-known for their ability to generate a broad variety of natural products with diverse biological functions and structurally distinct specialized metabolites. Most secondary metabolites encoded in actinomycete genomes remain undiscovered since these genes are not transcribed under standard laboratory conditions, and these approaches tend to rediscover known secondary metabolites.

Methods: De-salinization and elicitation of the underlying gene clusters have received significant attention in order to find and isolate novel lead natural products and molecular scaffolds. Modulation of the fermentation conditions, known as "one strain many compounds," and stimulating the bacterial cells with external cues, either chemically or physiologically, are examples of co-cultivation or mixed fermentation.

Results: This review summarizes notable and successful examples of elicitation method based on an encyclopedic literature search from 2015 untill 2021, including changing culture conditions, modifying the medium, co-cultivating with different strains, and adding a biosynthetic precursors or epigenetic modifiers.

Conclusion: Several methods for triggering silent BGC have been devised. These strategies allow for the development of new metabolite scaffolds as well as the improvement of the production of minor secondary metabolites. In recent years, successful strategies for the biosynthesis of novel natural compounds have included cross-species co-cultures, molecular and chemical elicitation.

PG-02

Promising Cytotoxic Butenolides From The Soybean Endophytic Fungus *Aspergillus Terreus:* A Combined Molecular Docking And *In-Vitro* Studies

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Background: Cancer is a complex disease characterized by abnormal cellular growth and is the major cause of death worldwide.

Methods: Herein, fermentation of the isolated strain, *Aspergillus terreus*, associated with soybean was done on five media. The derived extracts were investigated for their inhibitory activities against three human cancer cell lines; mammary gland breast cancer (MCF-7), colorectal adenocarcinoma (Caco-2) and hepatocellular carcinoma (HepG2) using MTT Assay. The most active extract was subjected to further chromatographic studies. The isolated compounds were screened through a molecular docking approach for their binding aptitude to various cancer active sites.

Results: The fungal mycelia fermented in Modified Potato Dextrose Broth (MPDB) was the most cytotoxic extract against HepG2, MCF-7 and Caco-2 cell lines with IC_{50} 4.2 ±0.13, 5.9 ±0.013 and 7.3 ±0.004 $\mu g.mL^{-1}$, respectively. MPDB extract was scaled up resulting in the isolation of six metabolites; three fatty acids (**1, 2** and **4**), one sterol (**3**) and two butenolides (**5** and **6**) by column chromatography. Docking studies revealed that butyrolactone-I **(5)** showed significant interaction within the Cdk2 active site, while aspulvinone E **(6)** showed promising binding affinity to FLT3 and EGFR active sites that was confirmed by *in vitro* CDK2, FLT3 and EGFR inhibitory activity.

Conclusion: Molecular docking analysis and in vitro assays suggested the CDK2/A2 inhibitory potential of butyrolactone-I (5) in addition to the promising interaction abilities of aspulvinone E (6) with EGFR and FLT3 active sites as a possible mechanism of their biological activities.

PG-03

Plectrabarbene, a New Abietane Diterpene from Plectranthus barbatus Aerial Parts

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Background: *Plectranthus barbatus* Andr. is one of the most popular medicinal plant in the genus *Plectranthus* and possesses various potential biological activities.

Methods: Two kilograms of the air-dried powder of P. barbatus aerial parts were extracted four times with 70% of EtOH (4 _ 2.5 L) at room temperature. The resulting organic extracts were concentrated under reduced pressure to yield 58.4 g of the dark brown residue which subjected to several chromatographic techniques. The structures of these compounds were determined by various spectral techniques (e.g., UV, IR, NMR, and FAB) and by comparison with the literature data. A molecular docking study of the isolated diterpenes (**1**–**3**) was performed with AChE to gain an insight into their AChE inhibition mechanism.

Results: A new abietane diterpene namely plectrabarbene (**2**), together with two known compounds: sugiol (**1**) and 11,14-dihydroxy-8,11,13-abietatrien-7-one (**3**) have been isolated from the aerial parts of Plectranthus barbatus Andr. (Labiatae). The results of docking experiments revealed that the all tested compounds showed binding a_nity at the active site of AchE in comparison to donepezil.

Conclusion: Three pure compounds (**1**–**3**) were isolated and identified fromthe aerial parts of P. barbatus; one of them is a new natural chemical entity (**2**). Structures of the isolated compounds were characterized on the basis of various spectroscopic analyses. In addition, molecular docking of these isolated compounds was carried out with AChE and all the compounds showed strong binding a_nity at the active site of AchE.

Industrial Pharmacy

PI-01

Itopride HCl Taste Masked Oro-Disintegrating Tablets Using Different Co-Processed Excipients: Pharmacokinetics Study on Rabbits

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Background: Itopride HCl is a prokinetic on the upper and lower GIT which is mediated by its dual mechanism of action as a D2 receptor antagonist and cholinesterase inhibitory action. Itopride can relieve the clinical symptoms and mental health status of patients with Irritable Bowel Syndrome, GERD, and FD accompanied by abdominal distension, so it is worthy of clinical promotion.

Methodology: Nine formulae of solid dispersion were prepared to mask the bitter taste of Itopride HCl using Eudragit EPO® and mannitol at different ratios after compatibility studies using IR. The prepared formulae were subjected to different physicochemical characterization, in vivo taste evaluation, and drug content. The best-selected formulae were used to formulate ten different ODTs and were evaluated among different parameters.

Results: F5 and F8 formulae were selected as the best taste-masked formulae based on in vivo taste evaluation, which were used to formulate ten ODTs. T10 had friability of 0.15, wetting time of 4±0.35 sec, and in vitro dissolution of 100.08±0.028% just after 2 min, where the in vitro disintegration time and in vivo disintegration time were 4±0.12 sec and 12±0.049 sec respectively.

Conclusion: The obtained results successfully confirmed the potential of the promising formula (T10) to produce rapid onset action and in-time drug release instead of ordinary tablets containing itopride HCl and that provide by-passing the excessive degradation of drug by first-pass metabolism increasing the oral bioavailability from 60% of marketed drug Ganaton® to 88% for T10.

PI-02

Fabrication of Nanostructured Lipid Carriers Ocugel for Enhancing Loratadine Used in Treatment Of COVID-19 Related Symptoms: Statistical Optimization, *in-vitro, ex-vivo,* and *in-vivo* studies evaluation

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Introduction: Loratadine (LORA), is a topical antihistamine utilized in the treatment of ocular symptoms of COVID-19. The study aimed to develop a Loratadine Nanostructured Lipid Carriers Ocugel (LORA-NLCs Ocugel), enhance its solubility, trans-corneal penetrability, and bioavailability.

Methods: full-factorial design was established with 2^4 trials to investigate the impact of several variables upon NLCs properties. LORA-NLCs were fabricated by using hot melt emulsification All formulae were assessed in terms of entrapment efficiency (EE%), size of the particle (PS), zeta potential (ZP), and in-vitro release. Via using Design Expert® software the optimum formula was selected, characterized using FTIR, Raman spectroscopy, and stability studies. Gel-based of optimized LORA-NLCs was prepared using 4% HPMC k100m which was further evaluated.

Results: The optimized LORA-NLCs, comprising Compritol 888 ATO® , Labrasol® , and Span® 60 showed EE% of 95.78±0.67%, PS of 156.11±0.54nm, ZP of −40.10±0.55Mv, and Qh6% of 99.67±1.09%, respectively. It illustrated a spherical morphology and compatibility of LORA with other excipients. Consequently, gel-based on optimized LORA-NLCs showed acceptable pH, drug content, viscosity, and Q12%. LORA-NLCs and LORA-NLCs Ocugel exhibited higher ex-vivo trans-corneal penetrability compared with the aqueous drug dispersion. Confocal laser scanning showed valuable penetration of fluoro-labeled optimized formula through corneal. The Draize Test showed no signs of inflammation in rabbits, and histological analysis showed no effect or damage to rabbit eyeballs. C_{max} and the AUC_{0-24} were higher in LORA-NLCs Ocugel compared with pure Lora dispersion-loaded gel

Conclusion: The research findings confirmed that NLCs could enhance solubility, trans-corneal penetrability, and the bioavailability of LORA.

PI-03

Formulation and Characterization of Cinnarizine Targeted Aural Transfersomal Gel for Vertigo Treatment: A Pharmacokinetic Study on Rabbits

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Introduction: Cinnarizine is indicated orally to treat vertigo associated with Ménière's syndrome and has a local anesthetic effect as well. The present study aims to develop an aural Cinnarizine mucoadhesive transfersomal gel to overcome the first-pass metabolism.

Methods: Eighteen Cinnarizine transfersomes were prepared by the thin-film hydration technique using different types of phosphatidylcholine and edge activators in different ratios. Formulae were tested for their appearance, entrapment efficiency, and in-vitro drug release after eight hours. The best formulae were selected to be examined for particle size, polydispersity index, and zeta potential. According to the previous parameters, F1and F10 were incorporated into gels using different polymers according to factorial design 2^3. The gels were tested for appearance, pH, mucoadhesion, spreadability, drug content, eight hours in-vitro drug release, and rheology. The transfersomal gel F1A was subjected to FTIR analysis and in-vivo pharmacokinetic study.

Results: The transfersomes EE% ranged from 64.36±1.985% to 94.09±1.74%, and their in-vitro release was between 61.82±1.92% and 95.92±1.18%, PS ranged from 212.3±30.05nm to 2150±35.35nm, DI from 0.238±0.134 to 1±0.00 and zeta potential from −57.5 ±2.54 to +4.73±1.57 mV. The transfersomal gels showed pseudoplastic behavior, pH range of 5.5 to 8, and accepted mucoadhesive force, spreadability, and in-vitro drug release. The IR spectra revealed no shifts of incompatibility. The in-vivo pharmacokinetic study illustrated that $[AUC]_{0-24}$ of F1A was significantly higher than that of market tablets at ($P< 0.05$).

Conclusion: The study revealed that Cinnarizine aural mucoadhesive targeted delivery provides an improved systemic bioavailability over the conventional oral route.

PI-04

Formulation and Characterization of Clotrimazole Transethosomal Gel: A topical Treatment of skin Taeniasis

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Introduction: Clotrimazole is a broad-spectrum topical antifungal drug used for the treatment of tinea parasitic infections. The present study aims to develop a topical Clotrimazole mucoadhesive transethosomal gel to improve its local antifungal efficacy.

Methods: Eight clotrimazole transethosomes were prepared by the thin-film hydration technique using phosphatidylcholine and edge activators and ethanol in different ratios according to factorial design 2^3. Formulae were tested for their appearance, entrapment efficiency, and in-vitro drug release after eight hours, particle size, polydispersity index, and zeta potential. According to the previous parameters, F3 was incorporated into four different gel formulae using different polymers according to factorial design 2^2. The prepared gels were examined for appearance, pH, spreadability, drug content, in-vitro drug release after eight hours, and rheology. The transethosomal gel F3D was selected as the optimum preparation.

Results: The EE% of the transethosomal dispersions ranged from 58.36±0.882% to 93.92±1.35%, the in-vitro release percentages were between 78.68±1.45% and 98.92±0.99%. Also, the vesicles PS ranged from 210.5±52.11nm to 620±14.22nm, dispersity index from 0.208±0.11 to 0.512 ±0.61 and zeta potential from −55.9±1.43 to +2.33±0.72 mV. The transethosomal gels showed pseudoplastic behavior, pH range of 5.5 to 6.4, spreadability of 32 ±3.21mm to 59 ±1.47 mm, and in-vitro drug release of 65.46±1.19% to 93.10±0.22%.

Conclusion: The study revealed that F3D clotrimazole transethosomal gel has an acceptable result in all the performed evaluations and will be subjected to an in-vitro and in-vivo microbiological investigation to compare it with the marketed topical cream candistan®.

PI-05

Propranolol Hydrochloride Loaded Invasomal Mucoadhesive Gel As A Locally Acting Contraceptive

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Background: It was found that propranolol hydrochloride (PNL), which is a beta-blocker used for hypertension treatment, has a potent spermicidal activity subsequently it could be used as a contraceptive remedy.

Methodology: PNL-loaded mucoadhesive invasomes (INVs) were prepared via the thin-film hydration technique. The prepared INVs were characterized via entrapment efficiency percent (EE%), particle size (PS), zeta potential (ZP), and amount of drug released after 6 h (Q6h). Design Expert® was bestowed to nominate the desired formula. The selected INV was subjected to further studies and formulated into a mucoadhesive gel for ex-vivo and in-vivo investigations.

Results: The optimum INV showed a spherical shape with EE% of 65.01 ± 1.24%, PS of 243.75 ± 8.13 nm, PDI of 0.203 ± 0.01, ZP of 49.80 ± 0.42 mV, and Q6h of 53.16 ± 0.73%. Permeation studies confirmed the desired sustained effect of PNL-loaded INVs-gel compared to PNL-gel, INVs, and PNL solution. Sperm motility assay proved the potency of INVs-gel to inhibit sperm motility. Besides, the histopathological investigation verified the tolerability of the prepared INVs-gel.

Conclusion: The gained data explained the efficacy and the safety of PNL-loaded INVs-gel as a potential locally acting contraceptive.

PI-06

Optimization Using D-Optimal Design and *in vitro, ex vivo,* and *in vivo* Studies

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Aim: This study aims to develop efficient topical therapy for keratomycosis using sertacona- zolenitrate (STZN)-loaded leciplex (LP).

Method: The D-optimal design was used to optimize STZN-loaded LP by utilizing soy phosphatidylcholine (SPC) molar ratio (X_1), cationic surfactant molar ratio (X_2), and cationic surfactant type (X_3) as the independent variables, whereas their impact was studied for entrapment efficiency percent (EE; Y_1), particle size (PS; Y_2), polydispersity index (PDI; Y_3), zeta potential (ZP; Y_4), and permeability coefficient (Kp; Y_5). The optimized formula was evaluated regarding morphology, ex vivo permeation, mucoadhesion, stability, and in vivo studies.

Results: The optimized formula was spherical and showed EE of 84.87 ± 1.71%, PS of 39.70 ± 1.35 nm, PDI of 0.242 ± 0.006, ZP of +54.60 ± 0.24 mV, and Kp of 0.0577 ± 0.0001 cm/h. The ex vivo permeation study revealed that the optimized formula enhanced the Kp and corneal deposition by 2.78 and 12.49 folds, respectively, compared to the aqueous drug dispersion. Furthermore, the optimized formula was stable and revealed promising mucoadhesion properties.

Conclusion: The in vivo studies showed that the optimized formula was superior to the drug dispersion in treating rats with induced keratomycosis. These results confirmed the capabilities of LP as a promising nanocarrier for treating ocular diseases topically.

PI-07

Lyophilized Nasal Inserts of Atomoxetine HCl Solid Lipid Nanoparticles for Brain Targeting as a Treatment of Attention-Deficit/Hyperactivity Disorder (ADHD): A Pharmacokinetics Study on Rats

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Background: Lyophilized atomoxetine solid lipid nanoparticles (ATM-SLNs) nasal inserts were prepared to achieve targeted delivery to the brain.

Methodology: A full factorial design with 2^4 trials was used to prepare 16 systems of (ATM-SLNs) by optimization of four variables; lipid type (Compritol or stearic acid) (X1), lipid to drug ratio (X2), co-surfactant ratio (X3) and probe sonication time (X4). They were prepared using hot melt emulsification, stirring and ultrasonication method technique. They were characterized for entrapment efficiency (EE%), % atomoxetine released (Q30min%), particle size (PS), zeta potential (ZP) and polydispersity index (PDI). Design Expert® software selected the optimum systems and morphology was examined using (TEM). Additionally, eight lyophilized inserts were optimized using a 2^3 full factorial design: The optimized (ATM-SLNs) (X1), polymer type (X2) and polymer concentration (X3). They were evaluated for nasal inserts' physicochemical properties. The two optimized inserts (S4 and S8) were subjected to DSC stability study and in-vivo study on rats.

Findings: (ATM-SLNs) showed EE% of (41.14 to 90.6 %), (Q30min%) of (27.11 to 91.08 %), ZP of (−8.52 to −28.4 mV), PS of (320.9 to 936.7 nm) and PDI of (0.222 to 0.658). (ATM-SLNs) had spherical morphology. Nasal inserts had assay analysis of (82.5 to 103.94%), Q15min% of (89.9 to 100%) and Muco-adhesion of (3510.5 to 9319.5 dyne/cm^2). DSC results showed compatibility of (ATM) with the other excipients. S8 and S4 achieved (BTE%) of (211.3% and 177.42%) and (DTP%) of (52.7% and 43.64%), respectively.

Conclusion: Lyophilized nasal inserts of (ATM-SLNs) achieved targeted delivery to the brain.

PI-08

Oral Bioavailability Enhancement of Vancomycin Hydrochloride with Cationic Nanocarrier (Leciplex): Optimization, *In Vitro*, *Ex Vivo*, and *In Vivo* Studies

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Background: To explore the performance of the cationic nanocarrier leciplex (LPX) in escalating the oral bioavailability of vancomycin hydrochloride (VAN) by promoting its intestinal permeability.

Methods: With the aid of a D-optimal design, the effect of numerous factors, including lipid molar ratio, cationic surfactant molar ratio, cationic surfactant type, and lipid type, on LPX characteristics, including entrapment efficacy (EE%), particle size (P.S.), polydispersity index (P.I.), zeta potential value (Z.P.), and steady-state flux (Jss) were assessed. The optimized formula was further evaluated in terms of morphology, ex vivo permeation, stability, cytotoxicity, and in vivo pharmacokinetic study.

Results: The optimized formula was spherical-shaped with an E.E. of 85.2 ± 0.95%, a P.S. of 52.74 ± 0.91 nm, a P.I. of 0.21 ± 0.02, a Z.P. of + 60.8 ± 1.75 mV, and a Jss of 175.03 ± 1.68 µg/cm2/h. Furthermore, the formula increased the intestinal permeability of VAN by 2.3-fold compared to the drug solution. Additionally, the formula was stable, revealed good mucoadhesive properties, and was well tolerated for oral administration. The in vivo pharmacokinetic study demonstrated that the VAN Cmax increased by 2.99-folds and AUC0-12 by 3.41-folds compared to the drug solution.

Conclusion: These outcomes proved the potentiality of LPX in increasing the oral bioavailability of poorly absorbed drugs.

PI-09

Topical Delivery of Extracted Curcumin as Curcumin Loaded Spanlastics Anti-Aging Gel: Optimization Using Experimental Design and Ex-Vivo Evaluation

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Background: There has been a growing interest in studying the potential anti-aging properties of curcumin. The development of age-related disorders is often linked to cellular dysfunction and damage caused by oxidative stress, which tends to increase as a person ages. Research has shown that curcumin can help protect against these processes, promoting healthy aging by supporting cell function and preventing damage.

Methodology: Twelve different Curcumin-loaded Spanlastic dispersions using the ethanol injection method with Span® 60 as a surfactant and Tween® 80 as an edge activator in varying ratios. The dispersions were then subjected to particle size analysis, zeta potential measurement, drug entrapment efficiency assessment, and in vitro release profiling. The optimized formula was selected and then used to create a gel preparation.

Results: F5 was the optimized formula so it was used to formulate HPMC gel-based preparations. The gel formula that was created and analyzed using Raman spectroscopy demonstrated no signs of incompatibility between the Curcumin and the polymers that were utilized. The confocal spectroscopy found that the anti-aging gel preparation showed promising results in terms of skin penetration. Also, images revealed that the gel could penetrate the layers of the skin, where it could potentially target and reduce the appearance of fine lines and wrinkles.

Conclusion: The obtained results successfully confirmed the potential of the promising (F5) formula to produce sustained release action. The confocal microscopical study suggested that the anti-aging gel had the potential to be an effective and safe topical treatment for aging skin.

PI-10

PLGA-PEG-PEI nanoparticles loaded with a mixture of Amphotericin-B and Lactoferrin were developed as thermosensitive hydrogels for potential eradication of ocular fungal infections: *in vitro*, *ex vivo*, and *in vivo* study.

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Background: The main objective of this work is the development of a new ophthalmic drug-delivery system for the treatment of both ocular inflammations and fungal eye infections. The current study investigates the improved topical efficacy, safety, penetrability, sustained drug delivery, adhesion, and therapeutic effect of triblock polymer NPs loaded with AMP, BLF, and the combination of both agents, after embedding in thermosensitive gel formulations, for treating fungal eye infection, dry eye, and inflammation conjunctivitis.

Methods: The nanoparticles were prepared by a double emulsion solvent evaporation method. The studied factors were Drugs: PLGA (Ratio) (A) and P407:P188 (Ratio) (B), all at three levels defined as (-1, 0, +1). Percent entrapment efficiency (EE %) (Y1), particle size (PS) (Y2), poly-dispersity index (PDI) (Y3), zeta potential (ZP) (Y4), and in-vitro release after 48 hours (Q48h) (Y5) were studied using Design expert®.

Results: The optimized formula showed particle size (177.0±0.3nm), poly-dispersity index (0.01±0.01), zeta-potential (31.9±0.3 mV), and entrapment% (90.9±0.5) with improved *ex-vivo* pharmacokinetic parameters and *ex-vivo* trans-corneal penetrability, compared with the drug solution. Confocal laser scanning revealed valuable penetration of fluoro-labeled nanoparticles. Irritation tests (Draize Test), Atomic force microscopy, cell culture, and animal tests including histopathological analysis revealed the superiority of the nanoparticles in reducing signs of inflammation and eradication of fungal infection in rabbits, without causing any damage to rabbit eyeballs.

Conclusion: The developed nanotechnology of Amphotericin-B and lactoferrin-loaded triblock polymers PLGA-PEG-PEI- nanoparticles combination in thermosensitive gel gives asynergistic effect for thetreatment of fungal eye infection, conjunctivitis, and ocular.

PI-11

Formulation and Characterization of Lamotrigine Nasal Insert Targeted Brain for Enhanced Epilepsy Treatment

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Background: Lamotrigine. (LMT) is a triazine drug has an antiepileptic effect but with low water solubility, dissolution rate and thus therapeutic effect. Spanlastics are nano-vesicular carriers' act as site-specific drug delivery system. Intranasal route could direct the drug from nose to brain and provide a faster and more specific therapeutic effect. Therefore, this study aimed to upload lamotrigine onto nano-vesicles using spanlastic nasal insert delivery for effective epilepsy treatment via overcoming lamotrigine's low solubility and improving its bioavailability.

Methods: Lamtrigine-loaded nano-spanlastic vesicles were prepared by ethanol injection method. To study different formulation factor's effect on formulations characters; particle size (PS), Zeta potential (ZP), polydispersity index (PDI), entrapment efficiency percentage (EE%) and LMT released amount after 6 h (Q6h); 2^1 and 3^1 full factorial designs were employed. Optimized formula was loaded in lyophilized nasal inserts formulation which were characterized for LMT release and mucoadhesion. Pharmacokinetics studies in plasma and brain were performed on rats to investigate drug targeting efficiency.

Results: The optimal nano-spanlastic formulation (F4; containing equal Span 60 amount (100 mg) and edge activator; Tween 80) exhibited nano PS (174.2 nm), high EE% (92.75%), and Q6h > 80%. The prepared nasal inserts (S4) containing 100 mg HPMC has a higher mucoadhesive force (9319.5 dyne/cm^2) and dissolution rate (> 80% within 10 min) for rapid in vivo bio-distribution. In vivo studies showed considerable improvement brain and plasma's rate and extent absorption after intranasal administration indicating a high brain targeting efficiency.

Conclusion: The results achieved indicate that nano-spanlastic inserts offer a promising LMT brain targeting in order to maximize its antiepileptic effect.

PI-12

Graphene Nanosheets as Drug Delivery System for Cisplatin and Some of Its Analogs: A DFT Study

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Background*:* Graphene (GN) nanosheets have been widely exploited in biomedical applications as potential nanocarriers for various drugs due to their distinct physical and chemical properties.

Methods*:* In this regard, the adsorption behavior of cisplatin ($cisPtCl_2$) and some of its analogs on a GN nanosheet was investigated in perpendicular and parallel configurations by using density functional theory (DFT).

Results*:* According to the findings, the most significant negative adsorption energies (E_{ads}) within the $cisPtX_2\cdots GN$ complexes (where X = Cl, Br, and I) were observed for the parallel configuration, with values up to −25.67 kcal/mol at the H@GN site. Within the perpendicular configuration of the $cisPtX_2\cdots GN$ complexes, three orientations were investigated for the adsorption process, namely, X/X, X/NH_3, and NH_3/NH_3. The negative E_{ads} values of the $cisPtX_2\cdots GN$ complexes increased with the increasing atomic weight of the halogen atom. The Br@GN site showed the largest negative E_{ads} values for the $cisPtX_2\cdots GN$ complexes in the perpendicular configuration. The electron-donating character of the GN nanosheet increased as the electronegativity of the halogen atom increased. Based on the solvent effect outlines, the negative E_{ads} values generally decreased after the adsorption process in a water medium. The recovery time results were in line with the E_{ads} findings, where the $cisPtI_2$ in the parallel configuration took the longest time to be desorbed from the GN nanosheet with values of 61.6×10^8 ms at 298.15 K.

Conclusion*:* The findings of this study provide better insights into the utilization of GN nanosheets in drug delivery applications.

PI-13

Nanostrucutured Lipid Carriers (NLCs) for Augmentation of Zolmitriptan Bioavailability via the Transdermal Route

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Background: Migraine is a neurovascular disease manifested mainly as unilateral throbbing headaches. Zolmitriptan (ZMP) has an absolute oral bioavailability of less than 40%. As a result, our research intended to increase ZMP bioavailability by developing transdermal nanostructured lipid carriers (NLCs).

Methods: NLCs were prepared utilizing a combination of hot melt emulsification and high-speed stirring in a 32 full factorial design. The studied variables were liquid lipid type (X1) and surfactant type (X2). The developed NLCs were evaluated in terms of particle size (Y1, nm), polydispersity index (Y2, PDI), zeta potential (Y3, mV), entrapment efficacy (Y4, %) and amount released after 6 h (Q6h, Y5, %).

Results: At 1% Mygliol as liquid lipid component and 1% Span 20 as surfactant, the optimized formula (NLC9) showed a minimum particle size (138 ± 7.07 nm), minimum polydispersity index (0.39 ± 0.001), acceptable zeta potential (−22.1 ± 0.80), maximum entrapment efficiency (73 ± 0.10%) and maximum amount released after 6 h (83.22 ± 0.10%). The optimized formula was then incorporated into gel preparation (HPMC) to improve the system stability and ease of application. Then, the pharmacokinetic study was conducted on rabbits in a cross-over design. The calculated parameters showed a higher area under the curve (AUC0–24, AUC0–∞ (ng·h/mL)) of the developed ZMP-NLCs loaded gel, with a 1.76-fold increase in bioavailability in comparison to the orally administered marketed product (Zomig®).

Conclusion The declared results highlight the potential of utilizing the proposed NLCs for the transdermal delivery of ZMP to improve the drug bioavailability.

PI-14

The Deleterious Effect of Xylene-Induced Ear Edema in Rats: Protective Role of Dexketoprofen Trometamol Transdermal Invasomes *Via* Inhibiting the Oxidative Stress/NF-κB/COX-2 pathway

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Introduction: Pain and inflammation have a negative impact on a patient's quality of life and performance. Dexketoprofen trometamol (DKT) is a water-soluble, nonselective NSAIDs. Because DKT is quickly eliminated in the urine after oral delivery, its efficacy is limited and must be taken repeatedly throughout the day.
Methodology: A full factorial design (2^3) was implemented the influence of Lipoid S100 concentration, terpene concentration, and terpene type. All formulae were assessed in terms of (EE%), (PS), (ZP), and in-vitro release. Via using Design Expert® software the optimum formula was selected
Results: The optimum formulation (C1) showed the least %RE (53.29 ± 2.68 %), the highest %EE (86.51 ± 1.05 %), and nanosized vesicles (211.9 ± 0.57 nm) with (PDI) of 0.353 ± 0.01 and (ZP) of −19.15 ± 2.45 mV. DKT flux and deposition in stratum corneum, epidermal, and dermal skin layers were augmented by 2.6 and 3.51 folds, respectively, from the invasomal gel formulation (C1-G) compared to DKT conventional gel (DKT-G). The anti-inflammatory activity of C1-G was evaluated using a model of xylene-induced ear edema in rats. Xylene exposure upregulated the ear expression of COX-2 level and MPO activity. Xylene significantly increased the ear NF-κB p65, TNF-α, IL-Iβ, and MDA levels. These impacts were improved by applying C1-G compared to rats that received DKT-G and plain invasomal gel formulation (plain C1-G). The histopathological findings imparted substantiation to the biochemical and molecular investigations
Conclusion: C1-G could be a promising transdermal drug delivery system to improve the anti-inflammatory and pain management of DKT.

PI-15

Oral Dispersible Tablets: Formulation Design, Development, Characterization and Pharmacokinetics Study on Wistar Rats

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Background: The main objective of our study was formulating oral dispersible tablets (ODTs) of taste masked Cloperastine HCl and Rupatadine Fumarate by using the lyophilization technique that also enhanced dissolution of poor solubility of these active substances.

Methods: Taking 3 superdisintegrants as variables using the Minitab® 18 factorial design method, 27 formulae of ODTs were obtained. The powdered mixtures before direct compression were characterized using Carr's index, Hausner's ratio and angle of repose. The best powdered formulae were elected to be prepared as ODTs by direct compression to undergo characterization tests as wetting time, invitro disintegration test and invivo taste masking. The best formula of ODTs prepared by direct compression was elected to be optimized by the lyophilization technique. Incorporating Eudragit E PO® has a major role in the taste masking of lyophilized ODTs. A comparative invivo pharmacokinetic study of market products of two active substances was carried out for the conventional ODTs, lyophilized tablets and market products using Wistar rats by oral administration of (0.75 mg/mL) for each active substance.

Results: The bitter taste was apparently masked in the lyophilized ODTs assessed by invivo taste masking. The highest Cmax of Cloperastine HCl was found 17.25 mcg/mL in the group of Lyophilized ODTs. Furthermore; the highest Cmax of Rupatadine was found 78.88 mcg/mL in the same group.

Conclusion: Lyophilized tablets owned the best bioavailability for both active substances with the highest Cmax compared to market products and ODTs prepared by direct compression.

Pharmacology and Toxicology

PL-01

Investigating the Therapeutic Potential of a Seaweed Extract in Combination with a Mammalian Target of Rapamycin (mTOR) Inhibitor *in vitro* and *in vivo*

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Background: Breast cancer (BC) is one of the most common cancers worldwide. Despite recent advances in current therapies, resistance and relapse remain persistent problems. Our work investigated the chemomodulatory effect of fucoidan, a sulfated polysaccharide readily abundant in edible seaweeds, in combination with a clinically approved mammalian target of rapamycin (mTOR) inhibitor (everolimus) both *in vitro* on MCF-7 cells and *in vivo* in a mouse model of Ehrlich solid-phase carcinoma.

Methods: MCF-7, a human BC cell line, was used *in vitro*. MTT assay was used to calculate the IC_{50} of the drugs. *In vivo*, forty-six female Swiss Albino mice (23±2 g) were injected intramuscularly with Ehrlich ascites carcinoma cells (EAC) into the hind limb. After tumour development, mice were randomly allocated into four equal groups (n=10): untreated control; fucoidan; everolimus or their combination.

Results: *In vitro*, fucoidan synergistically reduced the IC_{50} of everolimus from >500 nM, as monotherapy, to 76.6 nM when combined with fucoidan. *In vivo,* the combination therapy showed a significantly reduced tumour progression throughout the treatment period. H&E staining of the control group demonstrated extensive sheets of pleomorphic and viable tumour cells. Conversely, the combination-treated groups revealed a marked increase in the central mass of necrotic tissue with abundant figures of fragmented and pyknotic cancer cells. No weight loss was detected in the treated mice indicating the lack of toxicity from the given therapies.

Conclusion: Our results provide the first preclinical data confirming the potential efficacy of this combination, nonetheless, further investigations are still required.

PL-02

Mangiferin mitigates di-(2-ethylhexyl) phthalate-induced testicular injury in rats by modulating oxidative stress-mediated signals, inflammatory cascades, apoptotic pathways, and steroidogenesis.

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Background: di-(2-ethylhexyl) phthalate (DEHP) is an endocrine disruptor that causes reproductive defects in male animal models. This study explored the plausible modulatory effects of mangiferin (MF) against DEHP-induced testicular injury in rats.

Methods: Thirty-two adult male albino rats were allocated into four groups. Two groups were given DEHP (2 g/kg/day, p.o) for 14 days. One of these groups was treated with MF (20 mg/kg/day, i.p) for 7 days before and 14 days after DEHP administration. A vehicle and MF -treated control groups were included.

Results: MF suppressed oxidative testicular injury by amplifying the mRNA expression of Nrf2 and increasing HO-1, glutathione, and TAC levels as well as SOD activity but it decreased malondialdehyde and nitric oxide levels. MF anti-inflammatory character was revealed by downregulation of the mRNA of NF-κB and content of TNF-alpha. MF modulated the apoptotic pathway by suppressing the mRNA of cytochrome c, FasL content, Bax IHC expression, caspase-3 activity and caspase-3 IHC expression. It also upregulated the expression levels of HSP70 and Bcl2. Moreover, MF played crucial roles in steroidogenesis and spermatogenesis by upregulation of the mRNA expression levels of HSP70 & c-kit and enhancement of StAR protein content, which were reflected in serum testosterone levels. Besides, the activities of testicular marker enzymes, namely, ACP, ALP & LDH, significantly increased. Histopathological observations provided evidence supporting the biochemical and molecular measurements.

Conclusion: MF corrected the DEHP-mediated deterioration of testicular functions, steroidogenesis and spermatogenesis through the modulation of Nrf2/HO-1, NF-κB/Cyt c/HSP70, and c-Kit signaling cascades.

PL-03

Cilostazol Attenuates Mesenteric Ischemia Reperfusion- Induced Lung Lesion: Role of PPAR-γ, NF-κB, and STAT3 Crosstalk

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Background: Cilostazol (Cilo), a phosphodiesterase-III inhibitor, has signified its efficacy against different ischemia/ reperfusion (IS/RE) models. Nevertheless, it has not fully illuminated its potential effect against intestinal IS/REinduced lung injury. Consequently, the study was fashioned to evaluate the feasible mechanism of action of Cilo against intestinal IS/RE-induced lung injury.

Methods: Wistar rats were treated with Cilo (0.1 g/kg, p.o.) or with a vehicle for 14 days prior to IS/ RE, induced by clamping of the superior mesenteric artery for 30 min with subsequent clamp removal for 2 h.

Results: The mechanistic study disclosed that Cilo protected the two studied organs, viz., lung, and intestine partially by intensifying the expression/content of PPAR-γ accompanied by reducing the expression/content of NF-κ B-p65 and STAT3. In addition to normaizing MDA, iNOS, and NOx, the Cilo antioxidant power was confirmed by intensifying tissues content of the total antioxidant capacity. With regard to the anti-inflammatory effect, Cilo reduced the effects of TNF-α, IL-6, and ICAM-1, which were reflected in MPO activity. Furthermore, Cilo had an anti-apoptotic attribute demonstrated by enhancing Bcl-2 content and lessening caspase-3 level.

Conclusion: Cilo provided conceivable protective mechanisms to modulate events concomitant with mesenteric IS/RE partly by modulating oxidative stress, inflammation, and apoptosis feasibly via the participation of PPAR- γ, STAT3, and NF-κB p65 signaling pathways.

PL-04

The Potential Neuroprotective Effects of Vortioxetine And Escitalopram Against 3-Nitro Propionic Acid-Induced Huntington's Disease in Rats: Modulation of Inflammasome Pathway

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Background: Huntington's disease (HD) is a progressive, neurodegenerative genetic disorder that affects muscle coordination, cognition, and behavior. Activation of inflammasome pathway is believed to contribute to HD progression. Vortioxetine and escitalopram showed beneficial effects in neurodegenerative diseases, however their impact on inflammasome pathway in HD remains unclear. This study aimed to investigate and compare the neuroprotective effects of vortioxetine and escitalopram in an *in-vivo* model of HD, targeting the inflammasome pathway.
Methods: HD was induced in rats by intraperitoneal administration of 3-nitro propionic acid (3-NP). Treatment groups received vortioxetine or escitalopram orally prior to and in tandem with 3-NP. Open-field and Elevated Plus Maze were conducted to assess locomotor activity. Enzyme-linked immunosorbent assay (ELISA) was utilized to measure TLR4, p-NF-κBp65, NLRP3, Caspase-1, and IL-1β levels in striatal tissues. Histopathological analysis of striatal sections was performed using Nissl, and hematoxylin and eosin stainings.
Results: Both drugs significantly hampered the key players of the inflammasome pathway and enhanced locomotor activity. Histopathological findings revealed that both drugs reduced edema, indicating a potential role in mitigating neuroinflammation.
Conclusion: In conclusion, vortioxetine and escitalopram exerted quiet comparable neuroprotective effects in HD rat model. The observed effects could be attributed, at least in part, to modulation of the inflammasome pathway.

PL-05

Brilliant blue G enhances Dapansutrile-induced NLRP3 Inflammasome Inactivation by Targeting P2X7R/NLRP3 and MyD88/NF-κB Signaling in DSS-Induced Colitis in Rats

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Background: Chronic ulceration of the colon is associated with the activation of TLR4/NF-κB and P2X7R/NLRP3 signaling pathways. We investigated the effect of individual or combined administration of BBG, a P2X7R blocker, and OLT1177, a selective NLRP3 inhibitor, in the dextran sodium sulfate-induced ulcerative colitis (UC) rat model.

Methods: The ulcerative rats were treated orally with brilliant blue G (BBG) (50 mg/kg/day) or OLT1177 (200 mg/kg/day) or a combination of both. Myd88 and NF-κB levels were measured by ELISA, qRT-PCR, and immunohistochemical staining. Cytokines known to be associated with TLR4/NF-κB or P2X7R/NLRP3 signaling were measured by ELISA. P2X7R and NLRP3 expression were measured by ELISA and qRT-PCR.

Results: The administration of BBG or OLT1177 ameliorated the toxic effects of DSS on the colon as they restored normal colonic macroscopic and microscopic morphology. BBG administration, but not OLT1177, reduced the expression of Myd88, NF-κB, IL-6, and TNF-α in addition to lowering P2X7R and oxidative stress levels. Individual BBG or OLT1177 administration decreased NLRP3 inflammasome recruitment and subsequent activation of caspase-1, IL-1β, and IL-18. However, the combined administration of OLT1177 with BBG potentiated its inhibitory effect on the NLRP3, which was reflected by the additional suppressive effect on caspase-1, IL-1β, IL-18 levels.

Conclusion: BBG/OLT1177 exhibited complementary effects and effectively ameliorated UC. This novel approach provides a basis for the clinical application of this combination for the treatment of IBDs and might also be promising for the pharmacological intervention of other NLRP3 inflammasome-dependent inflammatory conditions.

PL-06

Addressing Peroxisome Proliferator-Activated Receptor-gamma in 3-Nitropropionic Acid-Induced Striatal Neurotoxicity in Rats

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Background: Telmisartan (TEL) is an angiotensin II type 1 receptor blocker and a partial activator of peroxisome proliferator-activated receptor-gamma (PPARγ), which regulates inflammatory and apoptotic pathways. Increasing evidence has demonstrated the PPARγ agonistic property of TEL in several brain disorders.
Methods: The PPARγ effect of TEL was affirmed by using the PPARγ agonist pioglitazone (PIO), and the antagonist GW9662.
Results: 3-NP led to a significant reduction in body weight alongside motor and cognitive functioning. The striata of the 3-NP-treated rats showed energy-deficit, microglia-mediated inflammatory reactions, apoptotic damage as well as histopathological lesions. PIO and TEL improved motor and cognitive perturbations induced by 3-NP, as confirmed by striatal histopathological examination, energy restoration, and neuronal preservation. Both drugs improved mitochondrial biogenesis evidenced by elevated mRNA expression of PPARγ, PGC-1α, and TFAM, alongside increased striatal ATP and SDH. The mitochondrial effect of TEL was beyond PPARγ activation. As well, their anti-inflammatory effect was attributed to suppression of microglial activation, and protein expression of pS536 p65 NF-κB with marked attenuation of striatal inflammatory mediator's release. Anti-inflammatory cytokine IL-10 expression was concurrently increased. TEL effectively participated in neuronal survival as it promoted phosphorylation of Akt/GSK-3β, further increased Bcl-2 expression, and inhibited cleavage of caspase-3. Interestingly, co-treatment with GW9662 partially revoked the beneficial effects of TEL.
Conclusion: These findings recommend that TEL improves motor and cognitive performance, while reducing neuronal inflammation and apoptosis in 3-NP-induced neurotoxicity *via* a PPARγ-dependent signaling.

PL-07

Ellagic Acid Attenuates Liver Toxicity Induced by Valproic Acid In Rats

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Background: Valproic acid is a commonly used drug for many psychiatric disorders, particularly for epilepsy. However, it has been reported that its use is associated with possible side effects including hepatotoxicity. The present study investigated the hepatoprotective effect of ellagic acid against valproic acid-induced hepatotoxicity in rats.

Methods: Ellagic acid (60 mg/kg/day; p.o) was treated for one week, followed by concomitant injection of valproic acid (250 mg/kg/day; i.p.) for another 14 consecutive days to induce hepatocellular damage in adult Sprague-Dawley rats.

Results: Valproic acid showed a marked increase in serum enzyme activities, AST, ALT, ALP and GGT. In addition, it significantly increased MDA and NO along with a marked decline in reduced GSH content. At the same time, valproic acid administration resulted in marked elevation in hydroxyproline, TNF-a production and NF-kB expression. These results were confirmed by histopathological examination.

Conclusion: Treatment with ellagic acid markedly attenuated valproic acid-induced hepatic injury in rats.

PL-08

Cyclophosphamide Enfeebles Myocardial Isometric Contraction Force *via* RIP1/RIP3/MLKL/TRPM7-mediated Necroptosis

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Background: This study explores the negative impact of cyclophosphamide (CP) on cardiac contractility by specifically examining its effect on the active and passive tension of the cardiac muscle in-vitro and revealing the mechanism through which CP induces myocardial insult in-vivo.

Methods: In young male Sprague-Dawley rats, cardiac toxicity was induced by a single intraperitoneal injection of CP (150 mg/kg body weight). Axial heart tissue slices were electrically stimulated, and the total isometric contraction force was measured at varying pretension levels. Blood and tissue biochemical assays, and histological/ immuno-histological assessments were conducted to evaluate the underlying molecular mechanisms. Statistical analysis shows that there is a significant difference between the drugged and the control groups in terms of the active tension values. Moreover, the pre-tension stress significantly affects both the active and passive tension values.

Results: CP altered heart, body, and heart-to-body weight, desolated cardiac muscle architecture, surged cardiac enzymes (CK-MB, LDH, and cTn l), augmented myocardial oxidative stressors (MDA), and weakened myocardial antioxidant status (SOD/GSH). Mechanistically, cyclophosphamide prompted the necroptotic trajectory evidenced by the activation of RIPK1, RIPK3, MLKL and TRPM7, the inhibition of caspase 8 and BCL2 and the upregulation of the protein/mRNA expression of TNF-α and TNFR1.

Conclusion: This study identifies necroptosis as a key factor in cyclophosphamide-evoked myocardial contractility impairment, highlighting its potential as a target for alleviating antitumor-related myocardial damage. This innovative approach to investigating the underlying mechanisms of CP-induced cardiac toxicity offers valuable insights into the potential of developing new therapies to mitigate cyclophosphamide's negative impact.

PL-09

Vortioxetine Mitigates Neuronal Damage by Restricting PERK/eIF2α/ATF4/ CHOP Signaling Pathway in Rats Subjected to Focal Cerebral Ischemia-Reperfusion

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Background: Stroke has risen to the fifth and third most common causes of death in the United States and the rest of the world, respectively. Vortioxetine (VTX) is a multimodal antidepressant agent that balances 5-HT receptors and represses the serotonin transporter. Our study aimed to examine the neuroprotective impacts of VTX against cerebral ischemia caused by occluding the middle cerebral artery (MCA).

Methods: Until the middle cerebral artery occlusion (MCAO) induction, VTX (10 mg/kg/day) was taken orally for 14 days. Behavioral assessments were carried out 24 h after the MCAO technique. The hippocampal and cortical tissues of the brain were isolated to assess the histological changes and the levels of the biochemical parameters.

Results: VTX improved MCAO-induced neurological deficits and ameliorated histopathological changes in both hippocampal and cortical tissues of MCAO rats. Western blot analysis showed increments of p-PERK, CHOP, ASK-1, NICD, HES-1, HES-5, and p-eIF2α expression levels in MCAO rats. Moreover, ELISA revealed an increase in the levels of ATF4, IRE1, Apaf-1, and HIF-1α, while VTX administration ameliorated most of these perturbations induced after MCAO injury.

Conclusion: MCAO damage led to severe neurological deficits and histopathological damage.

PL-10

Liraglutide Mends Cognitive Impairment in Polycystic Ovary Syndrome in Rats

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Background: Polycystic ovary syndrome (PCOS), the rifest endocrine disorder in women, is involved in disrupting many metabolic processes. However, the impact of PCOS on cognitive deficits is still uncertain. Recently, Notch signaling pathway was identified as a key modifier in regulating the pathological process in the ovary and various neurodegenerative disorders. Liraglutide has favourable neuroprotective effects that may protect against the possible cognitive dysfunction in PCOS.

Methods: PCOS was induced in rats by administrating Letrozole orally for 21 successive days. Then, Liraglutide (LIR) was administered intraperitoneally for 30 days. Memory was examined using Y-maze, novel object recognition (NOR), and Morri's water maze (MWM) tests. Western blotting, enzyme immunoassay, and quantitative real-time PCR were used to examine Notch signaling downstream targets, as well as assessing the expression of the components of various pathways cross talked with Notch signaling in memory impairment. Furthermore, histopathological examination was performed to examine neuronal changes.

Results: Notch signaling was overexpressed in PCOS rats, which increased Aβ aggregation, apoptosis, and neuroinflammation. Additionally, histopathological examination showed neuronal degeneration, which was marked by diminished acetylcholine levels in the PCOS rats' hippocampi. Finally, serum levels of insulin and testosterone were elevated while estradiol was reduced. Treatment with LIR repaired Notch signaling-attributed changes and improved the PCOS-induced memory impairment in rats.

Conclusion: These findings suggest that Notch signaling chronic activation impairs cognitive functions in PCOS, while LIR may improve the PCOS-induced cognitive impairment by thwarting Notch signaling upregulation in PCOS.

PL-11

Nano Ivabradine Improves Behavioral Changes in 3-NP Induced Huntington Chorea in Rats

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Background: Huntington's disease (HD) is a rare neurodegenerative disorder associated with selective striatal degeneration resulting in motor anomalies "chorea". Experimentally, 3-nitropropionic acid (3-NP) is used to induce choreiform changes seen in humans. Ivabradine, a funny current channel inhibitor, has been proved to have neuroprotective effects in CNS disorders. However, its low lipid solubility impairs its ability to pass the blood-brain barrier. Interestingly, its nano formulation may increase its blood brain barrier penetration.

Methods: Rats were injected subcutaneously by 3-NP for 14 days. Then, nano formulated Ivabradine (nano iva) was injected intravenously every other day for 7 days. Movement was assessed using beam walking, cylinder, limb withdrawal and open field tests, while memory was examined by novel object recognition and psychiatric disorders were determined by forced swim test. Histopathological examination was performed to explore striatal neuronal changes.

Results: the 3-NP group showed deteriorated movement on beam walking, open field, cylinder and limb withdrawal tests, minimized discrimination index in novel object recognition and increased immobility time in forced swim test. Histopathological examination revealed shrunken degenerated neurons confirming striatal neurotoxicity in the rat striata of 3-NP group. Nano iva enhanced movement and memory and decreased immobility time. Histopathological examination revealed preserved structure of striatal neurons. Evaluating brain ivabradine concentration using HPLC asserts enhanced brain permeability of nano form.

Conclusion: nano iva revived the normal structure of striatum and enhanced the behavioral anomalies in rat HD model. These findings indicate that ivabradine may have promising neuroprotective effects in 3-NP induced HD rat model.

PL-12

Antidepressant and Cardioprotective Efects of Self-Nanoemulsifying Self-Nanosuspension Loaded with Hypericum perforatum on Post-Myocardial Infarction Depression in Rats

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Background: Hypericum perforatum (HP) is characterized by potent medicinal activity. However, the poor water solubility of many HP constituents limits their therapeutic effectiveness. Self-nanoemulsifying self-nanosuspension loaded with HP (HP.SNESNS) was formulated to improve the efficacy of HP.

Methods: Male Wistar rats (150–180 g) were purchased from a private breeding facility, Giza, Egypt. They were maintained in a 12:12 h light/dark cycle with a constant temperature (22°C±2°C) and humidity (50%±10%). Rats were allowed free access to a commercial diet and tap water ad libitum. Rats were randomly assigned into five groups, with seven rats in each group. Group I: saline/normal control rats was gavage orally with normal saline once per day (2 mL/kg) for 21 days. Group II: isoproterenol/ISP control rats were administered orally with normal saline once per day (2 mL/ kg) for 19 days. Group III: ISP+HP 100 rats were treated with HP (100 mg/kg) once per day for 19 days. Group IV: ISP+HP 300, rats were treated with HP (300 mg/kg) once per day for 19 days.

Results: In the current research, ISP intoxicated rats displayed elevated cardiac levels of NO compared to control. Conversely, HP administration (100 mg/kg and 300 mg/kg) resulted in a dose-dependent decrease in the NO levels. Interestingly, the cardiac levels of NO in the HP.SNESNS-treated group were comparable to normal levels.

Conclusion: formulation was developed to enhance the oral delivery of HP extract and potentiate its therapeutic effects as an antidepressant and cardioprotective agent. The in vivo study revealed a significantly improved cardiac function and decreased depression.

Microbiology and Immunology

PM-01

Molecular Characteristics of Carbapenem-Resistant *Klebsiella Pneumoniae* Isolates from Egyptian Hospitals

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Background: Carbapenem-resistant *Klebsiella pneumoniae* (CR-KP) infections are considered a global critical concern, causing a serious threat to public health.

Methods: 94 non-duplicate clinically significant *K. pneumoniae* isolates were collected from two Egyptian hospitals over one year. All collected isolates were subcultured, and their identification as *K. pneumoniae* was confirmed via automated VITEK 2 and MALDI-TOF MS. Subsequently, susceptibility testing, phenotypic and genotypic detection of the carbapenemase genes were performed.

Results: Most of the investigated isolates were extensively drug-resistant (XDR). Phenotypic assays showed that 90.43% (85/94) of the isolates produced carbapenemases, while PCR assay revealed that 97.87% (92/94) of the isolates harbored at least one carbapenemase-encoding gene. BlastN analysis of the sequenced PCR products against GenBank's non-redundant genome sequences showed that the *bla*$_{\text{OXA-48}}$ gene was the most predominant carbapenemase-encoding genotype among our isolates, found in 89/94 (94.68%), followed by *bla*$_{\text{NDM-1}}$ (65/94, 69.15%) and *bla*$_{\text{KPC-2}}$ (5/94, 5.32%).

Conclusion: The high incidence of carbapenem resistance and the terrifying spread of their encoding genes among *K. pneumoniae* isolates in Egypt are alarming, leading to limitations in the available therapeutic options for the management of these serious infections. Carbapenemases of the *bla*$_{\text{OXA-48}}$ and *bla*$_{\text{NDM-1}}$ genotypes are widespread in Egyptian healthcare settings, causing a current increase in carbapenem-resistant bacteria.

PM-02

Biochemical and Histopathological Effects of Colchicine and Moringa oleifera on Thioacetamide-Induced Liver Fibrosis in Rats.

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Background: *Moringa oleifera* is used in nurturing both animals and humans as an excellent nutritive supplement. Colchicine is a plant that is effective against gouty arthritis and other forms of rheumatic diseases. This study has thrown light on the hepatoprotective effects of *Moringa oleifera* ethanolic leaves extract and colchicine on thioacetamide-induced liver fibrosis in rats.

Methods: 42 male albino rats were collocated into seven groups. The experiment lasted for two months, through which all groups except for control and control positive were given *Moringa oleifera* ethanolic leaves extract and colchicine. Liver fibrosis was induced by intraperitoneal injection of thioacetamide (150 mg/kg) in groups II, V, VI &VII while other groups were injected with 0.9% normal saline of the same volume. Bodyweight was measured three times a week to detect the dose for each rat.

Results: The administration of thioacetamide leading a significant increase in serum liver enzyme level ALT, AST, ALP, and Total protein as compared to the control group, while treatment with colchicine and *Moringa oleifera* ethanolic leaves extract caused significantly decreased serum liver enzyme level by (P<0.05) than the induced hepatic group. In general, there is no fundamental difference between groups V, VI, and VII. Also revealed that the injection of thioacetamide (150 mg/kg) induced liver fibrosis characterized by a drastic decrease in total protein as compared to the control group (P <0.05). The colchicine or *Moringa oleifera* ethanolic leaves extract was able to restore dysfunction.

Conclusion: In general, the treatment with colchicine and *Moringa oleifera* showed good restoration in biochemical function and histopathology of the liver.

PM-03

Microbial Production of Uric Acid-Degrading Enzymes: A Whole Genome Sequencing-Based Pathway Identification

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Background: Uricase (urate oxidase) is a therapeutic enzyme that is widely used to catalyze the enzymatic oxidation of uric acid to result in allantoin 'The soluble form'. The enzyme could be used in the treatment of hyperuricemia and related disease conditions (*e.g.,* gout and tumor lysis syndrome).
Methods: In the present study, eighteen uricase-producing bacteria and eleven uricase-producing fungi were isolated on selective media supplemented with uric acid as a sole carbon source. These isolates were isolated from soil, wastewater and poultry waste. Based on preliminary screening of the clear zone indicating uric acid utilization on a uric acid agar plate. The most potent bacterial isolates capable of producing uricase were isolated from poultry waste and wastewater. The highest uricase-producing bacterial isolate was firstly identified by using a *16S rRNA* gene sequencing method, which showed high similarity to *Klebsiella sp.* and *Enterobacter sp.* Whole genome sequencing (WGS) was done to identify the uric acid degradation pathway and the obtained data confirmed that the isolated bacterial species was *Klebsiella pneumoniae.*
Results: Genome annotation proved the presence of *Hpx*-genetic system including two different genes encoding urate oxidase. *HpxB/Mkleb* gene, which has two different activities: allantoinase and extracellular uricase. Another gene was *HpxO* that encodes Flavin adenine dinucleotide (FAD)-dependent urate oxidase.

Conclusion: These results support the notion of uric acid-degradation activity of Klebsiella pneumoniae, that shed some light for further studies on these enzymes aiming to treat hyperuricemia conditions.

PM-04

Evaluation of Phenotypic and Genotypic Patterns of Aminoglycosides Resistance among Multidrug-Resistant Gram-Negative Bacteria Isolated from Different Egyptian Hospitals

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Background: Aminoglycosides are commonly used against life-threatening infections caused by Gram-negative bacteria (GNB). Recently, resistance to aminoglycosides has been growingly reported. Herein we aimed to assess the genotypic and phenotypic patterns of aminoglycoside resistance among GNB collected from various Egyptian hospitals.

Methods: A total of 195 clinical GNB isolates were collected from four tertiary hospitals in Cairo between November 2017 to October 2018. Bacterial identification was carried out by conventional biochemical tests and confirmed by the VITEK®2 system. Antimicrobial susceptibility testing was performed by the disk diffusion method and by measuring the minimum inhibitory concentration (MIC). The prevalence of genes encoding aminoglycoside-modifying enzymes (AMEs) and 16S rRNA methylase were screened by the PCR method using Specific primers.

Results: The frequency of GNB among the different collected clinical samples was as follows: *Klebsiella pneumoniae* (n = 86/195; 44.1%), *Pseudomonas aeruginosa* (n = 48/195; 24.6%), *Acinetobacter* spp. (n = 28/195; 14.3%), and *E. coli* (n = 24/195; 12.3%). 73.2% of our isolates were found to be resistant to all tested aminoglycosides. Amikacin showed the highest efficiency against *E. coli*. While gentamicin exhibited different levels of resistance among *Pseudomonas aeruginosa* (92%)\, *Klebsiella pneumonia* (90.6%), and *Acinetobacter* spp. (89.2%). Screening for aminoglycosides resistance-encoding genes revealed the presence of *aac(6')-Ib* gene (100%), *aph(3´)-VI* (45.8%), *armA* (37.5%), *aadA* (25%), *aac(3)-Ia* (16.6%), *ant(2´´)-I* (16.6%), and none of the tested isolates was found to carry *rmtA*.

Conclusion: Our study elucidated and gave insight on the high prevalence rate of aminoglycoside resistance-encoding genes among different Egyptian hospitals.

PM-05

Lactoferrin Adsorption onto Biosynthesized Zinc Oxide Nanoparticles for Inhibition of SARS-Cov-2 Entry and Replication with a Protective Effect Against Bleomycin-Induced Pulmonary Fibrosis in Adult Male Albino Rats

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Background: Severe acute respiratory syndrome 2019-new coronavirus (SARS-CoV-2) is a major global challenge caused by a pandemic disease, named 'COVID-19' with no effective and selective therapy available so far. COVID-19-associated mortality is directly related to the inability to suppress viral infection and the uncontrolled inflammatory response.

Methods: The ethanolic extract of *Coleus forskohlii* Briq leaves was employed in the green synthesis of zinc nanoparticles (Zn-NPs) by an immediate, one-step, and cost-effective method. Zn-NPs were coated with lactoferrin (LF) and characterized via several techniques, including Fourier transform infrared (FT-IR) spectroscopy, scanning electron microscope (SEM), transmission electron microscopy (TEM), energy-dispersive X-ray (EDX), and Zeta potential.

Results: The biosynthesized Zn-NPs were green in colour with an almost semi-spherical shape and a size of 77 nm, while the size of LF-coated Zn-NPs (LF-Zn-NPs) was up to 98 nm. Moreover, Zn-NPs and LF-Zn-NPs possessed high stability due to their zeta potentials of -20.25 and -44.3 mV, respectively. LF-Zn-NPs showed a potent inhibitory influence on the entry of SARS-CoV-2 into host cells by binding to the angiotensin-converting enzyme 2 (ACE2)-receptor and spike protein receptor binding domain at half maximal inhibitory concentration (IC_{50}) of 59.66 and µg/mL, respectively. The influence of LF-Zn-NPs on SARS-CoV-2 replication (RNA-dependent RNA polymerase activity) was also assessed with an IC_{50} of 49.23 µg/mL. Moreover, LF-Zn-NPs displayed a therapeutic improvement impact on Bleomycin-induced lung

fibrosis in adult albino male rats owing to their anti-inflammatory, antioxidant, and significant reduction in c-reactive protein (CRP), ferritin, lactate dehydrogenase (LDH), and D-dimer levels.

Conclusion: The obtained findings, taken together, offer a promising route for biosynthesized Zn-NPs and LF-Zn-NPs as promising candidates against COVID-19 outbreaks.

Pharmaceutical Organic Chemistry

PO-01

Simultaneous Square Wave Voltammetric Determination of Two Anti-Inflammatory Drugs Using a Bare Carbon Paste Electrode

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Background : Both Diclofenac sodium (DIC) and diflunisal (DIF) are classed as non-steroidal anti-inflammatory drugs (NSAID) and can be co-formulated in suppository dosage form known as Rheumafen Forte ® suppositories. The combination of diclofenac sodium with diflunisal is not recommended due to the increased gastrointestinal toxicity risk.

Methods : Universal buffer was introduced into the voltametric cell, then, several cyclic sweeps from 0.4 to 1.2 V were applied to obtain minimum background current. Different aliquot of standard solutions of DIC, and DIF were transferred to the voltametric vessel and preconcentration was implemented at 0.4 V for 30 s. Then, the voltammogram was recorded by square wave scanning. Standard addition method was used for sample determination.

Results: In this method, both cited ingredients were oxidized by a bare carbon paste electrode forming two well separated peaks at potential of 0.65 and 0.85 V. The prepared sensor showed good linear regression curves over the concentration ranges of 1 to 6 and 5 to 25 µg/ml for DIC and DIF, respectively, while the quantification limit and detection limit were 0.68 and 0.204 µg/ml for DIC and 4.553 and 1.366 µg/ml for DIF.

Conclusion: The present work introduced a novel, simple, sensitive and selective method by fabrication of bare carbon paste sensors for simultaneous voltametric determination of dicolfenac and diflunisal. The fabricated sensors were applied successfully for determination of both drugs together in pharmaceutical samples and synthetic samples with acceptable average recoveries comparable with the official method.

PO-02

New Promising Levofloxacin Derivatives: Design, Synthesis, Cytotoxic Activity Screening, Topo2β Polymerase Inhibition Assay, Cell Cycle Apoptosis Profile Analysis

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Background: Newly designed levofloxacin analogues were synthesized and evaluated for their anticancer activities to act as topoisomerase II beta inhibitors (Topo2β).

Methods: Spectroscopic techniques, Cytotoxic activity against 3 cancer cell lines, as well as normal cell lines, topo2β enzyme inhibition assay, cell cycle apoptosis, caspase-3 assay, and molecular modeling study were screened.

Results: The best activity against liver cancer cell line (Hep3B) was exhibited by the target compounds **3c**, **3e**, **4a**, and **6d** (IC_{50} = 2.33, 1.38, 0.60 and 0.43, respectively). (L-SR) leukemia cancer cell line was affected by compounds **3b**, **3g** and **4a** (IC_{50} = 1.62, 1.41 and 1.61, sequentially). **3c** possessed the best activity against breast cancer cell line (MCF-7) with IC_{50} = 0.66. Compounds **3c**, **3e**, **3g**, **4a** and **4c** exhibited Topo2β inhibition activities exceeding etoposide and levofloxacin as reference drugs. In cell cycle analysis, compound **3c** arrested the cell cycle at G2/M phase like etoposide and levofloxacin, while compounds **3e** and **4a** exhibit its arrest at S phase. Compounds **3c**, **3e** and **4a** showed a significant elevation in active caspase-3 levels. The effect of the new compounds on normal cells was also investigated including breast (MCF10a), liver (THLE2), and lymphocytic (PCS-800-011) normal cell lines.

Conclusion: A group of novel levofloxacin structurally related compounds were synthesized. Their cytotoxic activity against (MCF-7), (Hep3B) and (L-SR) cell lines were examined. Inhibition of Topo2β polymerase enzyme was investigated. Compounds **3c**, **3e**, **3g**, **4a** and **4c** showed the best Topo2β inhibition activity, compared to etoposide and levofloxacin as reference drugs.

PO-03

Design and Synthesis of 2- (4-Bromophenyl)Quinoline-4-Carbohydrazide Derivatives *via* Molecular Hybridization as Novel Microbial DNA-Gyrase Inhibitors

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Background: Microbial DNA gyrase is regarded as an outstanding microbial target. Hence, 15 new quinoline derivatives were designed and synthesized.

Methods: The antimicrobial activity of the afforded compounds was pursued via *in vitro* approaches. The two-fold dilution method was used to assess the values of MIC for quinoline derivatives besides, the MBC assay against each *S. aureus*, *E. coli*, and *C. albicans*. The biofilm inhibitory activity of quinolone derivatives **5**, **6a**, **6b**, **10**, **11**, **13**, and **14** against each of *S. aureus* and *C. albicans* was assessed. Consequently, an *S. aureus* DNA gyrase supercoiling assay was performed, using ciprofloxacin as a reference control. Using the co-crystallized inhibitor (ciprofloxacin) as a reference standard, molecular docking was conducted for the newly afforded antimicrobial candidates against the target protein of the S. aureus gyrase-DNA complex.
Results: Compounds **6b** and **10** unveiled IC_{50} values of 33.64 and 8.45μM, respectively. Alongside, ciprofloxacin exhibited an IC_{50} value of 3.80μM. Furthermore, a significant docking binding score was encountered by compound **6b** (−7.73 kcal/mol), surpassing ciprofloxacin (−7.29 kcal/mol). Additionally, both compounds **6b** and **10** revealed high GIT absorption without passing the blood brain barrier.
Conclusion: The reasonable IC_{50} values exhibited by compounds **6b** and **10** assure the proposed mechanism and the work perspective. The conducted structure–activity relationship study assured the usefulness of the hydrazine moiety as a molecular hybrid for activity either in cyclic or opened form.

Clinical Pharmacy Practice

PP-01

Demographic and Clinical Differences between Pregestational and Gestational Diabetes

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Background: The present study was conducted in an endeavour to study the differences between pregestational and gestational diabetes regarding the clinical data including the predisposing factors, comorbidities, complications, severity and of glucose intolerance, as well as maternal and fetal outcomes and complications.

Objective: The rate of Diabetes in Egypt has significantly increased, exceeding international rates. The International Diabetes Federation (IDF) listed Egypt among the world's top 10 countries in the number of patients with Diabetes. There are two primary subtypes of Diabetes in pregnancy. One of these is pregestational diabetes mellitus (PGDM). The second is hyperglycemia, which was first detected during pregnancy and should be classified as gestational DM (GDM). GDM is diagnosed when women satisfy at least one of the criteria during a 100g oral glucose tolerance test, (OGTT).

Method: This prospective study was conducted on ninety pregnant females. Patient's demographics, urine and blood analysis, HbA1c and OGTT at 24 and 28 weeks gestation, as well as ultrasonic screening for early prediction of any congenital malformations were assayed.

Results: There was a significant difference in terms of Oral glucose tolerance test at week 24 and 28 during fasting, Oral glucose tolerance test at week 24 and 28 after one hour, Oral glucose tolerance test at week 24 and 28 after two hours, Oral glucose tolerance test at week 24 and 28 after three hours using 100 gms glucose; p-value 0.0>5 .

Conclusion: The results of this study concluded that mothers with PGDM had worse pregnancy outcomes than those with GDM.

PP-02

Ezetimibe Evaluation as A Treatment of Hyperlipidemia in Patients with Covid-19

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Background: The current coronavirus disease known as (COVID-19) which has been declared by the World Health Organization (WHO) in December 2019 as a global health emergency and then after as a pandemic, represents a big challenge to all healthcare systems worldwide specially for managing the infection among patients who are hospitalized, acutely ill or elderly. The death rate caused by COVID-19 is not predictable but is increased by many factors including age, dyslipidemia, diabetes mellitus, obesity, and cardiovascular disorders. Since a lot of patients with these conditions are under lipid-lowering therapy,

Methods: this study was carried to understand the effectiveness, safety, and potential interactions between Ezetimibe, and patients with acute COVID-19 infection. In this study, the lipid profile, kidney functions, and glycated hemoglobin has been measured baseline and then after 25 days for patient with hyperlipidemia and suffers from acute COVID-19 infection.

Results: Serum cholesterol level, HDL, LDL and HDL risk factor were decreased in COVID case by 17%, 10%, 21%, and 7%, respectively. Interestingly, we observed a considerable increase in triglycerides concentration by 13.5%.

Conclusion: These findings reveal that Sars-CoV-2 might be a factor interacting with hyperlipidemia-reducing therapy, and lower ezetimibe efficacy. However, larger cohort studies are required to confirm these findings.

PP-03

The Impact of Metabolic Syndrome on Left Ventricular Performance: As Evaluated by Using Echocardiographic Examination

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Background: Metabolic syndrome may be associated with left ventricular dysfunction. For this reason, this study was carried out to evaluate the function of left ventricle in patients suffer from metabolic syndrome using Echocardiographic examination.

Patients and methods: This research included forty patients with metabolic and forty control matching age and sex volunteers without history of metabolic syndrome. Diagnosis of metabolic syndrome was performed according to IDF criteria. The study approved by ethical committee of Soaad-Kafafi hospital. Echocardiographic study was carried for all subjects. Statistical package SPSS version 21 was used for entered of statistical data. P value <0.05 was considered statistically significant. Normality was checked by Shapiro test.

Results: Left atrial diameter, Interventricular septum and posterior wall thickness were found to be significantly higher in patients with metabolic syndrome compared to control subjects. The incidence of diastolic dysfunction was significantly higher in metabolic syndrome group compared to control. However, no statistically significant difference in frequency of diastolic dysfunction among controlled, un-controlled or patients with normal lipid profile.

Conclusion: metabolic syndrome was associated with preclinical LV diastolic dysfunction although systolic function was preserved.

PP-04

A Randomized Controlled Open-Label Study of the Effect of Vitamin E Supplementation on Fertility in Clomiphene Citrate Resistant Polycystic Ovary Syndrome

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Background: To evaluate the effect of vitamin E on ovulation and pregnancy in women with clomiphene citrate-resistant polycystic ovary syndrome.
Methods: A prospective, randomized, controlled, open label study was conducted on women with clomiphene citrate-resistant polycystic ovary syndrome. Patients were randomized, to either control group (n=30), who received metformin 500 mg thrice daily, in addition to 150 mg/day clomiphene citrate for 5 days starting from day 3 of menstruation for 3 menstruation cycles, or vitamin E group (n=30) who received vitamin E 1500 IU/day for the whole study period in addition to metformin and clomiphene citrate with the same previous regimen. The primary outcome was cumulative ovulation rate, while secondary outcomes were pregnancy rate, serum midluteal progesterone, mean follicular diameter, number of dominant follicles and endometrial thickness.
Results: Ovulation was reported in 57 (64.8 %) of 88 cycles in the control group and 63 (73.3%) of 86 cycles in the vitamin E group (p=0.227), while pregnancy was reported in 4 (4.5 %) of 88 cycles in the control group and 6 (7%) of 86 cycles in the vitamin E group (P=0.491).There were non-significant differences between groups regarding serum midluteal progesterone, number of dominant follicles and mean follicular diameter. Endometrial thickness was significantly higher in the vitamin E group compared to the control group.
Conclusion: The findings of this trial do not support the hypothesis that vitamin E may increase the ovulation and pregnancy rates in women with clomiphene-citrate resistant polycystic ovary syndrome.

Pharmaceutics

PT-01

Bi-Laminated Oral Disintegrating Film for Dual Delivery of Pitavastatin Calcium and Lornoxicam: Fabrication, Characterization, and Pharmacokinetic Study

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Background: Pitavastatin calcium (PT) is an innovative drug of statins that enhances HDL-C and lowers LDL-C. However, myalgia has been reported in hyperlipidemic patients receiving statins. Therefore, co-administration of statins with NSAIDs such as Lornoxicam (LN) could be a solution to the former problem. Accordingly, this study aimed to formulate a bi-laminated oral disintegrating film (ODF) comprising PT in one layer and LN in the second one.

Methods: For the formulation and optimization of PT-ODFs, a $3^1.2^1$ factorial design was carried out, where the impact of polymer type and concentration on disintegration time (DT) and % PT released after 10 min (Q_{10}) was studied. PT-ODFs were prepared via the solvent casting method and then evaluated. One PT-ODF was chosen to represent the optimum formula according to the criteria of scoring the fastest DT and the highest Q_{10}. The optimized PT-ODF was merged with the second film layer containing LN, forming a bi-laminated ODF named S1 that underwent an in vivo pharmacokinetic study compared to the commercially available tablets for PT (Lipidalon) and LN (Lornoxicam) using rats as an animal model. LC-MS/MS was used to analyze plasma drug concentrations.

Results: All PT-ODFs showed acceptable outcomes. F1 scored the fastest DT (18.6±1.5 s) and the highest Q_{10} (91.3±3.0 %). S1 successfully recorded a maximum plasma concentration (C_{max}) of 2.04 and 2.24-folds increase for PT and LN, correspondingly, compared to commercially available tablets.

Conclusion: Merging PT and LN into bi-laminated ODF was promising for the fast delivery of both drugs with enhanced bioavailability.

PT-02

A Promising Single Oral Disintegrating Tablet for Co-Delivery of Pitavastatin Calcium and Lornoxicam Using Co-Processed Excipients: Formulation, Characterization and Pharmacokinetic Study

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Background: Statins are an important class of drugs that help to control hyperlipidemia, one of these statins recently used is Pitavastatin calcium (PITA). Nevertheless, the most reported adverse effect of statins is myopathy. So, combining statins with non-steroidal anti-inflammatory drugs (NSAIDs) as Lornoxicam (LORNO) can help in the management of statin-induced myopathy.
Method: Eight PITA-ODTs were prepared *via* direct compression. The prepared PITA-ODTs were evaluated for their weight variation, thickness, breaking force, friability, drug content, and wetting time (WT). *In-vitro* disintegration time (DT) and dissolution were also evaluated and taken as parameters for selection of the best formula based on the criteria of scoring the fastest DT and highest $Q_{10\ min}$. LORNO was added to the selected PITA-ODT, forming a single ODT (M1) comprising both drugs which was subjected to an *in-vivo* pharmacokinetic study using rats as an animal model and Liquid Chromatography-Mass Spectrometry (LC-MS/MS) for analysis of both drugs in rat plasma.
Results: Results showed that all PITA-ODTs had acceptable physical properties according to pharmacopeial standards. PITA-ODT prepared with Pharmaburst® (F2) had significantly ($p<0.05$) the fastest DT (6.66±1.52s) and highest $Q_{10\ min}$ (79.07±2.02%) and was chosen as the best formula. The *in-vivo* pharmacokinetic study of M1 showed higher percent relative bioavailability (%RB) of 286.7% and 169.73% for PITA and LORNO, respectively, compared with the marketed products.
Conclusion: The combination of PITA & LORNO into a single ODT showed great potential for instant co-delivery of both drugs with a higher %RB than the marketed products.

PT-03

Piroxicam Anchored into Nano-Spanlastics Gel: A Propitious Cutaneous Wound Healing Potential

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Background: Cutaneous wound is a challenging clinical dilemma affecting patients' quality of life, with a high economic burden that demands effective therapy of low cost.

Method: Nano-vesicular system made of piroxicam (PX) loaded nano-spanlastics was tailored and incorporated into alginate-pectin gel to maximize adherence to skin wounds. PX loaded into highly elastic nano-spanlastics, efficiently penetrates the skin, and crosses subcutaneous barriers for better drug deposition at wound site. Spanlastics were prepared utilizing 2^3 full factorial experimental designs. Scrutinized factors were Span 60: Edge Activator (EA) ratio, EA type and Permeation Enhancer (PE) type. Measured responses were vesicle size (VS), poly dispersity index (PDI), and percentage entrapment efficiency (EE %). Optimal formula was further incorporated into gel matrix of sodium alginate and pectin. Release and rheology studies of PX gel were performed. In vitro cytotoxicity was investigated by MTT assay using human skin fibroblasts. Cell migration rate of human skin fibroblasts was investigated by scratch assay. The extent of cellular regrowth to close the scratch was measured.

Results: Optimal PX nano-spanlastics formula of the highest desirability value (0.964) demonstrated vesicle size of 124.13 ± 1.31 nm, PDI of 0.214 ± 0.01 and 97.27 % ± 0.21 EE %. About 70 % and 60 % of PX was released from S4 dispersion and gel, respectively, within 24 h, compared to only 33.6 % released from PX aqueous suspension. Gel demonstrated non-Newtonian pseudoplastic shear thinning flow. PX nano-spanlastics gel was biocompatible with human skin fibroblasts and significantly promoted the migration rate of fibroblasts compared to control.

Conclusion: These auspicious results verified the promising wound healing aptitude of optimized PX nano-spanlastics gel.

PT-04

Preparation and Characterization of a Novel Mucoadhesive Carvedilol Nanosponge: A Promising Platform for Buccal Anti-Hypertensive Delivery

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Background: Carvedilol (CRV) is a non-selective third generation beta-blocker used to treat hypertension, congestive heart failure and angina pectoris. Oral administration of CRV showed poor bioavailability (25%), which might be ascribed to its extensive first-pass metabolism. Buccal delivery is known to boost drugs bioavailability. The aim of this study is to investigate the efficacy of bilosomes-based mucoadhesive carvedilol nanosponge for enhancing the oral bioavailability of CRV.
Methods: The bilosomes were prepared, optimized, and characterized for particle size, surface morphology, encapsulation efficiency and ex-vivo permeation studies. Then, the optimized formula was incorporated into a carboxymethyl cellulose/hydroxypropyl cellulose (CMC/HPC) composite mixture to obtain buccal nanosponge enriched with CRV bilosomes.
Results: The optimized bilosome formula (BLS9), showing minimum vesicle size, maximum entrapment, and highest cumulative in vitro release, exhibited a spherical shape with 217.2 nm in diameter, 87.13% entrapment efficiency, and sustained drug release for up to 24 h. In addition, ex-vivo drug permeation across sheep buccal mucosa revealed enhanced drug permeation with bilosomal formulations, compared to aqueous drug suspension. Consecutively, BLS9 was incorporated in a CMC/HPC gel and lyophilized for 24 h to obtain bilosomal nanosponge to enhance CRV buccal delivery. Morphological analysis of the prepared nanosponge revealed improved swelling with a porosity of 67.58%. The in vivo assessment of rats indicated that CRV-loaded nanosponge efficiently enhanced systolic/diastolic blood pressure, decreased elevated oxidative stress, improved lipid profile, and exhibited a potent cardio-protective effect.

Conclusion: Collectively, bilosomal nanosponge might represent a plausible nanovehicle for buccal delivery of CRV for effective management of hypertension.

PT-05

Formulation and Development of Oral Fast-Dissolving Films Loaded with Nanosuspension to Augment Paroxetine Bioavailability: *In Vitro* Characterization, *Ex Vivo* Permeation, and Pharmacokinetic Evaluation in Healthy Human Volunteers

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Background: Paroxetine (PX) is used in depression and anxiety treatment. It has drawbacks, such as having a very bitter taste, low water solubility, and undergoing extensive first pass metabolism, leading to poor oral bioavailability. This work aimed to develop and optimize palatable oral fast-dissolving films (OFDFs) loaded with PX nanosuspension. PX nanosuspension was prepared to increase the PX solubility and permeability via the buccal mucosa. The OFDFs could increase PX bioavailability due to the rapid absorption of PX through the buccal mucosa, thus decreasing its metabolism in the liver. OFDFs also offer better convenience to pediatric, elderly, and developmentally disabled patients.
Methods: The PX nanosuspension was characterized by particle size, poly dispersity index, and zeta potential. Twelve OFDFs were formulated using a solvent casting technique. A 22 × 31 full factorial design was applied to choose the optimized OFDF, utilizing Design-Expert® software.
Results: The optimized OFDF (F1) had a 3.89 ± 0.19 MPa tensile strength, 53.08 ± 1.28% elongation%, 8.12 ± 0.13 MPa Young's modulus, 17.09 ± 1.30 s disintegration time, and 96.02 ± 3.46% PX dissolved after 10 min. The permeation study, using chicken buccal pouch, revealed increased drug permeation from the optimized OFDF; with a more than three-fold increase in permeation over the pure drug. The relative bioavailability of the optimized OFDF in comparison with the market tablet was estimated clinically in healthy human volunteers and was found to be 178.43%.
Conclusion: These findings confirmed the success of the OFDFs loaded with PX nanosuspension for increasing PX bioavailability.

PT-06

Formulation of Atorvastatin Emulsomes Foam as A Promising Approach for Drug Repurposing as A Topical Antifungal Agent

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Background: Dermal fungal infection faces many challenges, especially for immunocompromised patients. Recently, the repositioning of atorvastatin (ATO) as a promising anti-mycoses therapy is used to overcome some issues of conventional therapeutic agents such as microbial resistance. This study aimed to develop a suitable formula for dermal fungal infection.

Methods: ATO was entrapped into emulsomes and then incorporated in a foam system for topical convenient application. The D-optimal design was used for the optimization of ATO-emulsome and foam to achieve suitable responses. Regarding emulsomes, cholesterol weight and sonication time were independent variables that impact emulsome size, polydispersity index, surface charge, and entrapment efficiency.

Results: The optimum formula showed a size of 359.4 ± 8.97 nm, PDI of 0.4752 ± 0.012, a zeta potential of −21.27 ± 0.53 mV, and a drug entrapment of 95 ± 2.38%. Transmission electron microscope and Fourier-transform infrared spectroscopy (FT-IR) proved the assembly of ATO-emulsome. Foam composition was optimized to achieve good expansion, stability, and viscosity using a surfactant triple mixture and hydroxypropyl methylcellulose. The selected ATO-emulsome foam which consisted of 1% HPMC, 1.249% SDS, and 4% pluronic showed prolonged drug release. Efficient permeation through skin layers was asserted by using a confocal laser scanning microscope. Moreover, the homogenous distribution of the foam bubbles upholds stability and conserves the system from rapid collapse. The antifungal activity was confirmed by an *in-vitro* and *in-vivo* microbiology study beside *in-vivo* biocompatibility.

Conclusion: ATO-emulsome and incorporation in foam have demonstrated good antifungal activity, presenting a unique aspect for potential clinical applications.

PT-07

Clinical Assessment of Atorvastatin Loaded Eugenol-Enriched Pegylated Cubosomes In-Situ Gel for the Intra-Pocket Treatment of Periodontitis

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Background: Atorvastatin calcium (ATV) is a well-known anti-hyperlipidemic drug currently being recognized for possessing an anti-inflammatory effect. Introducing it as a novel remedy for periodontitis treatment necessitates developing a syringeable modified delivery system capable of targeting inflammation within the periodontal pockets.

Methods: A 3^3 Box-Behnken design was used to generate eugenol-enriched PEGylated cubosomes. The impact of independent variables, which were lipid phase concentration (X_1), Gelucire® 44/14 concentration (X_2), and homogenization time (X_3), were studied on the dependent ones, which were solubilization efficiency (SE%) (Y_1), particle size (PS) (Y_2), polydispersity index (PDI) (Y_3), percentage of ATV released after 0.5h ($Q_{0.5h}$) (Y_4), and percentage of ATV released after 8h (Q_{8h}) (Y_5). Based on the desirability function, the optimized formulation was selected and loaded into an optimum in-situ gel (ISG) which was evaluated clinically on systemically healthy patients.

Results: The optimized formulation exhibited SE% of 97.71±0.49%, PS of 135.20±1.11nm, PDI of 0.09±0.006, zeta potential of −28.30±1.84mV and showed a sustained drug release over 12h. It displayed a cubic structure under the transmission electron microscope. The ISG displayed the desired periodontal gelation temperature (34±0.70°C) and an adequate gelation time (46±2.82sec), it also released approximately 75% of ATV within 72h. Clinical evaluation of the ISG showed a promising percentage reduction of 58.33% in probing depth, 90% in bleeding index, 81.81% in plaque index, and 70.21% in gingival levels of transforming growth factor–β1.

Conclusion: This proved that the formulated syringeable intra-pocket delivery system of ATV is an efficient candidate for diminishing inflammation in periodontiti

PT-08

Innovative Mirtazapine Formula Loaded into Mesoporous Silica Nanostructures *In-vivo* Assessment

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Background: Employment of mesoporous silica nanostructures (MSNs) in the drug delivery field has shown a significant potential for improving the oral delivery of active pharmaceutical products with low solubility in water. Mirtazapine (MRT) is a tetracyclic antidepressant with poor water solubility (BCS Class II), which was recently approved as a potent drug used to treat severe depression.

Method: The principle of this research is to optimize the incorporation of Mirtazapine into MSNs to improve its aqueous solubility, loading efficiency, release performance, and subsequent bioavailability. The formulation was optimized by using of Box-Behnken Design, which allows simultaneous estimation of the impact of different types of silica (SBA-15, MCM-41, and Aluminate-MCM-41), a different drug to silica ratios (33.33%, 49.99%, and 66.66%), and different drug loading procedures (Incipient wetness, solvent evaporation, and solvent impregnation) on the MRT loading efficiency, aqueous solubility and dissolution rate.

Results: The optimized formula was achieved by loading MRT into SBA-15 at 33.33% drug ratio prepared by the incipient wetness method, which displayed a loading efficiency of 104.05%, water solubility of 0.2 mg/ ml, and 100% dissolution rate after 30 min. The pharmacokinetic profile of the optimized formula was obtained by conducting the in-vivo study in rabbits which showed a marked improvement (2.14-fold) in oral bioavailability greater than plain MRT.

Conclusion: As a result, the findings demonstrated that the optimal response successfully eliminated the medication's extensive poor water solubility and boosted its oral bioavailability.

PT-09

Lamotrigine Solid Self-Nanoemulsifying Drug Delivery System: Design, Optimization, *In-vitro* and *In-vivo* Assessment

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Background: Lamotrigine (LMG) is an antiepileptic drug of the phenyltriazine class which is used widely in epilepsy, simple and complex seizures, and bipolar disorder. Preparation of solid self-nanoemulsified drug delivery system (S-SNEDDS) of lamotrigine was aimed to enhance its dissolution and oral bioavailability (BA).

Methods: Solid self-nanoemulsified systems were prepared (R1-R19) using D-optimal design with different ratios of oil, surfactant, and cosurfactant,. The formulations were characterized regarding robustness to dilution, droplet size, thermodynamic stability testing, self-emulsification time and, in-vitro release studies in 0.1 N HCL and phosphate buffer solution (PBS) at (pH 6.8). Design expert® 11 software was used to select the optimum formulations. Eight S-SNEDDS were prepared (S1-S8) using 2^3 factorial designs, and characterized by DSC, SEM, PXRD. The optimum formulation was chosen regarding in-vitro drug released in 0.1 N HCL and PBS, compared to pure LMG and commercial tablet (Lamictal®). The BA of LMG from the optimized S-SNEDDS formulation was evaluated in rabbits compared to pure LMG and Lamictal®.

Results: The optimized S-SNEDDS was S2, consisting of R9 adsorbed on Aeroperl® 300 in a ratio of 1:1, with the best results regarding to in-vitro drug released in 0.1 N HCL at 15 min (100%) compared to pure LMG (73.40%) and Lamictal® (92.08%). The BA of S2 was increased 2.03 and 1.605 folds compared to pure LMG, and Lamictal® respectively.

Conclusion: S2 is a promising S-SNEDDS formulation. It can be a potential carrier for improving dissolution, and BA of LMG.

DAY 2

UNDERGRADUATE POSTERS

Topic	Code
Biochemistry	PB
Pharmaceutical Chemistry	PC
Pharmacognosy	PG
Industrial Pharmacy	PI
Pharmacology and Toxicology	PL
Microbiology and Immunology	PM
Pharmaceutical Organic Chemistry	PO
Clinical Pharmacy Practice	PP
Pharmaceutics	PT

Biochemistry

PB-01

A Novel Formula of Hydrolyzed Marine Collagen Powder for Oral Administration

Doha Shery, Ellen Taha

Under supervision of:
Dr. Sherif Shawky
Dr. Yehya Ahmed

Marine collagen is taking from skin of fish. It is called type 1 collagen as it derived from fish collagen peptide. Researchers are still studying the effectiveness of fish collagen as a supplement. Natural marine collagen is activated by hydroxylation which transforms the skin fish into collagen peptide. The smaller the peptide the easier to be absorbed through the body. Collagen maintains the health and appearance of the skin, making it an essential component in anti-aging skincare. As we age, the production of collagen decreases, leading to a loss of elasticity and the appearance of fine lines and wrinkles. The existing skincare in the market, customers find ineffective solutions, limited bioavailability and high prices. Therefore, we created a new novel formulation that offers high value and customer benefits including better absorption by novel active ingredients which give visible improvements and skin regeneration. It has affordable price and anti-aging benefits. It called Beauty Drink by BeGorg.

PB-02

Genetically Engineered Food

Nada Tarek; Alaa Khaled; Ahmed Yassin; Heba Mohamed Elfeky; Rewida Emad; Aya Salem

Under supervision of:

Dr. Hoda Shamloula

Abstract

Genetic modification is a special set of gene technology that alters the genetic machinery of such living organisms as animals, plants, or microorganisms. Combining genes from different organisms is known as recombinant DNA technology and the resulting organism is said to be Genetically modified (GM) GM)'', Genetically engineered' or Transgenic''. The principal transgenic crops grown commercially in the field are herbicide and insecticide resistant soybeans, corn, cotton, and canola. Other crops grown commercially and/or field tested are sweet potato resistant to a virus that could destroy most of the African harvest, rice with increased iron and vitamins that may alleviate chronic malnutrition in Asian countries and a variety of plants that are able to survive weather extremes. Although GMOs are in a lot of the foods we eat, most of the GMO crops grown in the United States are used for animal food. To make it easier for consumers to know if the foods they eat contain GMO ingredients, the U.S. Department of Agriculture maintains a list of bioengineered foods available throughout the world. In addition, the "bioengineered" labels are seen on some of the foods we eat because of the new National Bioengineered Food Disclosure Standard.

PB-03

Preventing Maternal Phenylketonuria (PKU) Syndrome: Important Factors to Achieve Good Metabolic Control Throughout Pregnancy

Nagham ahmed, Hager hagag, Mohamed ali , Marwa ali, Aya Ahmed Sayed, Shahd Mohamed Sayed, Menna Walid Mohamed, Esraa adel sayed

Under supervision of:
Dr. Hoda Shamloula

Abstract

Insufficient metabolic control during pregnancy of mothers with phenylketonuria (PKU) leads to maternal PKU syndrome, a severe fetopathy. We evaluated the most important dietary and psychosocial factors to gain and sustain good metabolic control in phenylketonuric women throughout pregnancy by a questionnaire survey with 38 questions concerning therapy feasibility. Among them, the key questions covered 5 essential items of PKU care as follows: General information about maternal PKU, PKU training, diet implementation, individual metabolic care, personal support. In addition, all participating PKU mothers were asked to estimate the quality of their personal metabolic control of the concluded pregnancies. 54 PKU mothers with 81 pregnancies were included. According to metabolic control, pregnancies of PKU women were divided in two groups: group “ideal” (not more than 5% of all blood Phe concentrations during pregnancy > 360 µmol/l; n = 23) and group “suboptimal” (all others; n = 51). The demand for support was equally distributed among groups, concerning both amount and content. Personal supports by the direct social environment (partner, family and friends) as well as individual metabolic care were rated as most important factors. Group “ideal” presented a 100% realistic self-assessment. In contrast, group “suboptimal” overestimated their metabolic control in 53% of the pregnancies. Offspring of group “suboptimal” showed clinical signs of maternal PKU-syndrome in 27%. In conclusion the development of training programs by specialized metabolic centers for females with PKU in child bearing age is crucial.

PB-04

Recombinant Proteins and Drug Manufacturing

Youssef Hussein, Ahmed Emad, Mohamed Abdelsalam, Ammar Yasser, Ahmed Ragab, Abdelrahman Kamal

Under supervision of:

Dr. Hoda Shamloula

Abstract

Recombinant proteins are synthetic proteins that are produced through genetic engineering methods. They have become an essential tool in the field of drug manufacturing, as they offer several advantages over traditional protein production methods. Recombinant proteins can be produced in large quantities, are highly pure, and are free from contaminants that can cause adverse effects. This has led to the development of numerous drugs that are based on recombinant proteins, including insulin, growth hormones, and monoclonal antibodies. The process of manufacturing recombinant proteins involves several steps, including gene cloning, protein expression, and purification. The gene encoding the protein of interest is isolated and inserted into a host organism, such as bacteria, yeast, or mammalian cells, that can produce large quantities of the protein. The protein is then purified using various techniques, such as chromatography, to obtain a highly pure product. Recombinant protein-based drugs have revolutionized the treatment of several diseases, including cancer, autoimmune disorders, and genetic disorders. They offer targeted therapies that can selectively target specific cells or molecules, resulting in fewer side effects and improved patient outcomes. Recombinant proteins have become an indispensable tool in drug manufacturing. They offer numerous advantages over traditional protein production methods and have led to the development of several life-saving drugs. As the field of genetic engineering continues to advance, it is likely that recombinant proteins will continue to play a significant role in the development of new and innovative therapies for a wide range of diseases.

PB-05

Study on Genetic Engineering of Acremonium Chrysogenum the Cephalosporin C Producer

Amira Mohamed El-shafei, Mai Abd Elnabi, Mariam Maher Abd Elmonem, Nourhan Wael Bakr, Yomna Yousri Hamza

Under supervision of:

Dr. Hoda Shamloula

Abstract

Acremonium chrysogenum is an important filamentous fungus which produces cephalosporin C in industry. This review summarized the study on genetic engineering of Acremonium chrysogenum, including biosynthesis and regulation for fermentation of cephalosporin C, molecular techniques, molecular breeding and transcriptomics of Acremonium chrysogenum. We believe with all the techniques available and full genomic sequence, the industrial strain of Acremonium chrysogenum can be genetically modified to better serve the pharmaceutical industry. To introduce exogenous DNA into A. CHRYSOGENUM, a traditional PEG mediated protoplast transformation method is commonly used. Since we are focusing on high-yield, or industrial strains, which usually have a stronger restriction-modification system than wide-type strain, the traditional transformation method is not efficient enough for introduction of exogenous genes. Currently, this technique has been used in microorganisms including *E. COLI, STREPTOMYCES* and Yeast. Although Filamentous fungi is relative difficult to genetically modify, we are trying this system in A. CHRYSOGENUM in our lab. There are also some publications on genome editing of Filamentous fungi such as *ASPERGILLUS, PYRICULARIA, TRICHODERMA* and *PENICILLIUM* in the recent two years. Thus, we believe it is possible to edit the genome of *A. CHRYSOGENUM* by the newly developed system.

PB-06

Application of Genetic Engineering in Pharmaceutical Product

Michael Youssef, Gerges Adeeb, Maroska Farid, Sandy Adel, Salma Hosny

Under supervision of:

Dr. Hoda Shamloula

Abstract

Genetic engineering is the manipulation, recombination of DNA or other nucleic acid molecules in order to modify an organism or population of organisms. The techniques employed in genetic engineering have led to the production of medically important products, including human insulin, human growth hormone, and hepatitis B vaccine, as well as the development of genetically modified organisms such as disease-resistant plants. Industrial applications include transforming microorganisms such as bacteria or yeast, or insect mammalian cells with a gene coding for a useful protein. Mass quantities of the protein can be produced by growing the transformed organism in bioreactors using fermentation, then purifying the protein. One of the uses in pharmaceuticals was gene splicing to manufacture large amounts of insulin, made using cells of E. coli bacteria. Interferon, which is used to eliminate certain viruses and kill cancer cells, also is a product of genetic engineering, as are tissue plasminogen activator and urokinase, which are used to dissolve blood clots. Another byproduct is a type of human growth hormone; it's used to treat dwarfism and is produced through genetically-engineered bacteria and yeasts. The evolving field of gene therapy involves manipulating human genes to treat or cure genetic diseases and disorders. Modified plasmids or viruses often are the messengers to deliver genetic material to the body's cells, resulting in the production of substances that should correct the illness. Sometimes cells are genetically altered inside the body; other times scientists modify them in the laboratory and return them to the patient's body.

PB-07

Banana Vaccine Transplantation

Basma Hosam, Rana Wagih, Habiba Ibrahim, Zainab Hesham, Merna Mohamed

Under supervision of:

Dr. Hoda Shamloula

Abstract

In recent years, there has been a growing interest in developing innovative and cost-effective methods for vaccine delivery to combat infectious diseases. Banana vaccine transplantation, a novel concept, has emerged as a potential solution to address the challenges associated with traditional vaccine production and distribution. This poster aims to explore the concept of banana vaccine transplantation and its implications for global health. It provides an overview of the technology, its benefits, challenges, and future prospects, highlighting its potential to revolutionize the field of vaccination. Hepatitis B is a disease which has caused major loss of life over the years. The treatment for the disease is very expensive and cure rate is less. Due to its high cost developing or underdeveloped countries are far out of reach from treatment to hepatitis B. There are vaccines produced against this disease but its cost has limited the use by the masses. In the recent years the plant based vaccines called edible vaccines which are cheap compared to the traditional vaccines have been current area of research. Edible vaccines using banana have been prepared for Hepatitis B.

PB-08

DNA Fingerprinting (DNA typing, DNA profiling)

Nora Mohamed Salama, Ayman Hassan Ali, Heba Mohammed Saeid, Rahaf Elsaid Mohamed, Nada Osman Mahmoud

Under supervision of:

Dr. Hoda Shamloula

Abstract

DNA fingerprinting (also called DNA profiling or forensic genetics) is a technique that uses DNA analysis and comparison to resolve legal problems, such as paternity tests and inheritance matters, establish identity in criminal cases where biological evidence is found at crime scenes, and identify victims of mass disasters and missing persons from human remains. Some of the products of recombinant technology are of human origin including constantly changed and improved. There are VNTRs present in the genome of every organism which can be determined by using this technique. DNA polymorphism can be studied. The position and the number of VNTRs are revealed during DNA fingerprinting. This technique can be useful in the identification of suspect since it is very remote possibility to have two individual's same repeats of satellite DNA throughout the genome except they share a biological relationship. Restriction enzymes of genome produce the restriction fragments length polymorphisms or RFLPs depending on the location of restriction sites which are then sorted by gel electrophoresis followed by southern blotting. The blots of the suspect and of the sample from the crime scene are compared for sequence homology using radioactive probes. This can also be used for paternity testing in the case of lost child and is also used in various fields of forensics.

PB-09

Genetically Engineered Drugs

Omar Abdelrazek Ibrahim, Mohamed Mohamed Fouad, Eman Hamdi Ibrahim, Mohamed Shaher Adaileh, Donia Khalid Kamal, Sara Elsayed Abouheish

Under supervision of:

Dr. Hoda Shamloula

Abstract

Over the previous two periods, many genetically engineered drugs have been developed and accepted for the treatment of patients. These drugs are characterized by a high and specific activity in the presence of optimal safety. They include hormones, enzymes, growth and coagulation factors, antibodies as well as vaccines. Recombinant technology or genetic engineering is a modern method used for the synthesis of therapeutic agents. The central theme of recombinant technology is the process of gene cloning which consists of the production of a defined fragment of DNA and its propagation and amplification in a suitable host cell. Drugs developed by recombinant technology or genetic engineering are known as biologics, biopharmaceuticals, recombinant DNA expressed products, bioengineered, or genetically engineered drugs. Various products of recombinant technology are from human origin including erythropoietin, coagulation modulators, enzymes, hormones, interferons, interleukins, granulocyte colony-stimulating factors, anti-rheumatoid drugs, and various other agents like TNF, becaplermin, hepatitis-B vaccine, antibodies etc. They are proteins and nucleic acids and are very specific, safe and pure agents.

Pharmaceutical Chemistry

PC-01

Vitamin B2: The Pharmacological Activities and Structural Modifications.

Haneen waleed , Amira abdelfatah , Salma Mohamed , Shahd Atef , Kholud Elsayed , Sohila Abdelattief , Ahmed Anweer , Khaled Hassan , Moaz Ahmed , Omar Ayman Mohamed MahmoudMohamed Hafeza,Radwan Hazem Radwana, Mennatullah Nasera, Eman Ibrahim Mohameda, Mohamed Ahmed Sobhya,Sara Mohameda , Ali Gamal, Alia, Marwa Elsayeda, Ahmed Salaha,Mohamed Shehataa, Yomna Yasser Abdellatif Elgorg , Doaa Tarek Abdelnaem Basha, Aya Abdelnasser, Reham Abd El Salam Rashed Mohamed, May Sherif Mohamed, Alaa Taha Abdelamed, Aliaa Abdelnaiem, Yasmin Mohamed Hamed, Nisreen Mohamed Abououf , Nada Ayman Ibrahim.

Under supervision of:

Prof. Dr. Sohair L. El-Ansary

Dr. Akram Hifny

Abstract

Vitamin B-12 (cobalamin) plays an essential role in red blood cell formation, cell metabolism, nerve function and the production of DNA, the molecules inside cells that carry genetic information. This research discuss riboflavin as its unique water-soluble vitamin in that milk and dairy products make the greatest contribution to its intake in diets. Meat and fish are also good sources of riboflavin, and certain fruit and vegetables, especially dark-green vegetables, contain reasonably high concentrations. Biochemical signs of depletion arise within only a few days of dietary deprivation. This research reviews current evidence that diets low in riboflavin present specific health risks. There is reasonably good evidence that poor riboflavin status interferes with iron handling and contributes to the etiology of anemia when iron intakes are low. Current interest is focused on the role that riboflavin plays in determining circulating concentrations of homocysteine, a risk factor for cardiovascular disease. On the other hand, this research discusses the structure activity relation & the modifications that can done on its structure to improve its activity as supplement.

PC-02

Vitamin C : The Pharmacological Activities and Structural Modifications.

Sara Elsayed , Reem Mohamed ,Tasbih Ali , Shorouk Tarek , Shorouk Mostafa , Yomna Ayoub , Nada Abdelhameed , Amira Medhat , Abrar Abdelkader, Reham Mohamed , Nada Ahmed Sadek Hafez, Lena Magdy Ibrahim , Engy Soliman Atta Mahmoud , Elzhraa Abdelrahman Harfoush , Jihad Ali Nagib , Amira Ahmed Sayed, Salmin Shaker Ibrahim , Alaa Elsayed Elgazar , Mostafa Mohamed Fathy Elsherbiny , Youmna Ahmed Ali , Nada Tarek , Haitham Adel , Mariam Saed, Abdelrahman Ahmed , Safaa Emam , Nada Ahmed , Nour Magdy , EzzEldin Khaled , Hesham Yasser , Nouran Bahaa.

Under supervision of:

Prof. Dr. Sohair L. El- Alansary

Dr. Akram Hifny

Abstract

Ascorbic acid (AA) or commonly known as vitamin C, an essential water soluble vitamin that mut be consumed with adequate amounts so that our body functions properly including collagen synthesis, which its lack for example causes Scurvy disease. In addition, the regular structure and operation of blood vessels, neurological function, and the defense against infections and inflammation are all facilitated by vitamin C. It is widely used as an antioxidant due to its redox potential also in skin care industries as an anti-aging. However, it is highly unstable , so multiple attempts have been made to increase its resistance to degradation. In order to give its therapeutic effects, C2 must be unsubstituted. Hence esterification at C2 produces prodrugs which in vivo by enzymatic bioconversion produce AA with unchanged bioavailability such as phosphate esters, glycosylation, Esterification with fatty acids at the sixth position ,combination with Substances that give synergistic effect and reversible oxidation all showed success in increasing vitamin C stability.

Pharmacognosy

PG-01

Natural Products as a complementary medicine in Case of Covid 19 infection

Mohamed Emad and Youmna Alaa

Under supervision of:

Ass. Prof Dr. Samah Shabana

Abstract

COVID-19 pandemic has met international health systems with a low level of preparation and reserve response. For several thousands of years, natural products and medicinal plants have been approved for numerous diseases by traditional doctors. According to diverse studies, there are so many medicinal plants with antiviral activity, which can be used for viral infections or can be prescribed as supportive treatment. Herbal medicine can interfere with COVID-19 pathogenesis by inhibiting SARS-CoV-2 replication and entry to host cells. Healthcare professionals' accepting of popular CAMs and those sloped for potential benefits in COVID-19, patient and customer actions in relation to CAM use; and healthcare professionals' awareness of cultural, religious, and self-care practices associated with CAM use are authoritative to inform effective communication and counselling practices and promote evidence based self-care when patients present for advice. The aim of this review is to focus main herbal products, their source, characteristics, and potential antiviral actions that helps to eradicate COVID-19.

PG-02

Therapeutic uses of Rice Straw

Marc Adel and Mariam Emad

Under supervision of:

Dr. Samah Shabana

Abstract

Rice production is common as a fundamental food for much of the world. Rice, a staple food for more than half of the world's population, is grown in >100 countries with 90% of the total global production from Asia. However, it also results in the creation of large masses of non-food biomass, primarily in the form of straw and husks. Rice straw is biochemically composed of an agricultural-based lignocellulosic residual having 30 – 45% cellulose, 20 – 25% hemicellulose, 15 – 20 % lignin, and a minor percentage of organic compounds. the production of amino acids such as L-glutamate and L-lysine. Interesting for fermentation are the relatively high contents of cellulose and hemicellulose (32–47%, 19–27%) in rice straw, which have to be processed to allow access to the monomeric sugars. Conclusively, rice straw is source to produce biogas, and biohydrogen in biorefineries because it is a renewable, widely distributed, and easily available with very low cost, and its intake is protected and environment friendly. The aim of this review is to focus main medical uses which may be exist for rice straw and to make development in next step of our research.

Industrial Pharmacy

PI-01

The Development of Pulsating Fluid Bed Dryers: Advancements in Industrial Drying Technology for Heat-Sensitive Materials

Nadeen Ashraf, Alaa Ashraf, Toqa Mohammed, Toqa Salah, Toqa Ashour, Sahar Adel

Under supervision of:

Ass. Prof. Dr. Menna Abdellatif
Dr. Inas Essam

Abstract

Fluid bed dryers are commonly used in the pharmaceutical, food processing, and chemical industries for drying powders, granules, and other solid materials. They offer several advantages over other drying methods, including high heat and mass transfer rates, low drying times, and the ability to handle a wide range of materials with minimal risk of damage or degradation. However, heat-sensitive materials can be easily damaged or degraded by exposure to high temperatures, and fluid bed dryers typically use hot air or gas to fluidize and dry the material. To address this challenge, pulsating fluid bed dryers have been developed, which use a pulsating motion to agitate the fluidized bed of material, enhancing the fluidization process and improving heat and mass transfer rates. The use of pulsating fluid bed dryers can result in improved drying performance, reduced operating costs, and higher product quality and consistency. The development of pulsating fluid bed dryers involved a combination of engineering innovations and improvements in the understanding of fluidization behavior, resulting in a more efficient and effective drying technology for a wide range of industrial applications.

PI-02

New Approaches of Spray Dried in Pharmaceutical Industry

Mahmoud Hamada, Mohamed Adel, Reda Samir, Mohammed Rabee Mohammed, Ahmed saber, Toqa salah Eldin

Under supervision of:

Ass. Prof. Dr. Menna Abdellatif

Dr. Inas Essam

Abstract

Spray drying is an incessant industrial procedure that needs the use of a small number of excipients and offers great flexibility to formulation scientists due to the easy operation and scale-up. In a single continuous step, spray drying therefore converts a liquid feedstock into a powder with well-defined properties. Properties such as level of moisture or residual solvent in the powder, It is a technique widely used in the pharmaceutical industry to produce powders with desirable properties such as improved solubility, stability, and bioavailability. Spray drying has been proven for particle size engineering and known to improve the bioavailability of poorly soluble compounds. In recent years, new spray drying methods have been developed to improve the efficiency, quality and function of spray dried products. Such as co-spray drying, electrodynamic spray drying, and fluid-assisted supercritical drying, these approaches provide new opportunities for developing new drug products with improved therapeutic outcomes, as well as optimizing existing drug formulations.

PI-03

Addressing Challenges in Tray Dryers: New Design Approach

Mohamed Mahmoud Elsayed

Under supervision of:

Prof. Dr. Rehab Abdelmoneem
Ass. Prof. Dr. Menna Abdellatif
Dr. Mahmoud Eltahan

Abstract

This research examines the challenges associated with tray dryers, including low-quality product output, high power consumption, inadequate control of moisture content, and prolonged drying times. To address these issues, a design incorporating several improvements was proposed for the tray dryer. The enhancements encompass the integration of a more efficient heater, a mechanical trap system, the utilization of different tray types, and the inclusion of a decompression mechanism. The proposed design modifications were theoretically analyzed to assess their potential impact on the tray dryer's performance. The findings indicate that these improvements have the potential to alleviate the identified problems, resulting in enhanced product quality, reduced power consumption, improved moisture control, and shorter drying durations. Further experimental validation is recommended to verify the effectiveness of the proposed design enhancements in practical applications. This study contributes valuable insights to the field of tray dryer technology, providing guidance for practitioners aiming to optimize drying processes and overcome existing limitations.

PI-04

Modern View into Wearable Devices and Their Role in Disease Diagnosis and Monitoring

Naglaa Samy, Mariam Mohamed, Aya Osama, Hagger Elnaggar, Noran Sayed, Nada Mohamed

Under supervision of:

Prof. Dr. Rehab Ahmed Abdelmonem
Ass. Lec. Mahmoud Ahmed Eltahan

Abstract

Wearable Health Devices (WHDs) are progressively serving people to better screen their health rank both at an activity/fitness level for self-health tracking and at a medical level providing more data to clinicians with a potential for earlier diagnostic and guidance of treatment. The technology revolution in the miniaturization of electronic devices is enabling to design more reliable and adaptable wearables, contributing for a world-wide change in the well-being checking approach.Wearable devices are becoming increasingly popular in the field of healthcare, particularly in disease diagnosis and management. These devices can track various physiological parameters and provide real-time data that can aid in the diagnosis, treatment, and management of various diseases. Smart clothes, such as owling socks, ECG vests, and glucose monitoring wear, are examples of wearable devices that are being developed for disease diagnosis. These devices are designed to be comfortable and convenient, making them ideal for continuous monitoring of patients' health.

PI-05

Sustainable Manufacturing of Drug Materials

Presented by:

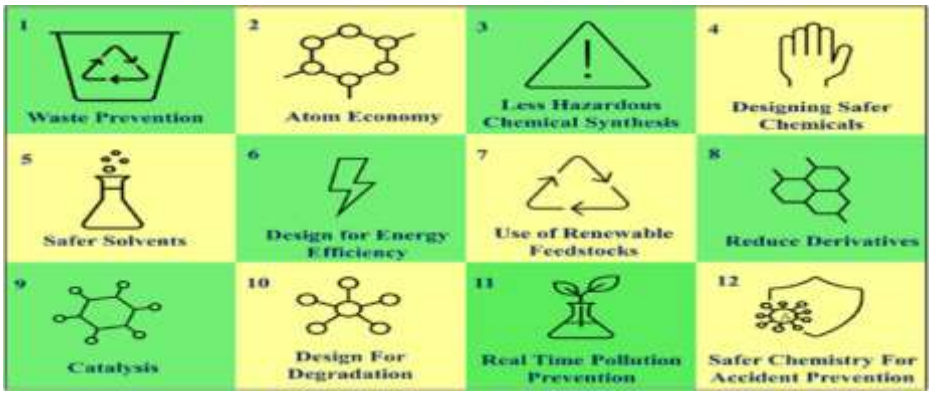
Ramy Talaat Foll Mikhail, Reham Ragab Abdelhamed ,Hend galal mohamed abualmagd, Mostafa Mohamed Mahmoud, Mohamed ashraf seddik

Under supervision:

Prof. Dr. Rehab Ahmed Abdelmonem
Asst. lec. Mohamoud Ahmed Eltahan

Abstract:

As the pharmaceutical industry looks ever-changing world-wide challenges and market services, it must review and revise product design to ensure that quality of pharmaceutical products remain available in the marketplace while moving toward zero pollution for air, water, and soil. Green chemistry nowadays is surpassing the idea of being a sheer lab inquisitiveness into the large-scale pharmaceutical application in industries. However, industries, being one of the most dynamic areas, always remain in the forefront of any substantial changes. These changes in the terms of innovative ideas, conventional feed stocks, safer raw materials, and alternative mechanisms in laboratories at pilot scale seem fascinating to apply in industries. The processes and chemicals used in medicines manufacture are often toxic, expensive and produce a lot of waste, which poses a threat to the environment. But there are signs that the pharmaceutical industry is moving in the right direction when it comes to green chemistry.



PI-06

Exploring the Use of Nanoparticles for Targeted Immunotherapy in Cancer Treatment

Presented by:

Ahmed Essam, Areeg hossam elden, Maryam Hossam, Menatalah abdel moneim

Under supervision of:

Prof. Dr. Rehab Ahmed Abdelmonem

Dr. Mahmoud Ahmed Eltahan

Abstract

Recently, cancer immunotherapy has become standard for cancer treatment. Immunotherapy not only treats primary tumours but also prevents metastasis and recurrence, representing a major advantage over conventional cancer treatments nanoparticles allow cancer specific drug delivery by inherent passive targeting and adopted active targeting strategies. Cancer immunotherapy is emerging as a promising treatment modality that suppress and eliminate tumor by 3 re-activating and maintaining the tumor-immune cycle, and further enhancing the body's anti-tumor immune response. This focuses on improving the pharmacokinetics and reduce the systemic toxicities of chemotherapies through the selective targeting and delivery of these anticancer drugs to tumor tissues. Also, increase the delivered drug's overall therapeutic index through Nano formulations in with chemotherapeutics are either encapsulated or conjugated to the surfaces of nanoparticles. Furthermore, delivery of immunostimulatory or immunomodulatory molecules in combination with chemo- or radiotherapy or as adjuvants to other immunotherapies and decreasing the toxicity of chemotherapeutics and increase their overall effectiveness.

PI-07

CGM Electronic Sensor, Novel Approach in Improving Medication Adherence and Patient Outcomes.

Shaza Khalid Gamal, Manar Sahl, Marwa Ahmed Mohammed, Nada Ibrahim Hassan, Doha El-sayed

Under supervision of:

Prof. Dr. Rehab Ahmed Abdelmonem
Ass. Lec. Mahmoud Ahmed Eltahan

Continuous glucose monitoring is a technique that measures glucose levels, usually interstitial glucose, continuously and updates the glucose level display every 1 to 5 minutes. By inserting a tiny sensor under the skin, typically on the belly or arm, CGM measures interstitial glucose levels in the fluid between cells every few minutes, and a transmitter sends the data wirelessly to a monitor. The monitor may be part of an insulin pump or a separate device carried in a pocket or purse. CGMs can transmit data to a smartphone or tablet, and sensors require replacement every 7 to 14 days. CGM offers several benefits, including increased data insight that enables informed decisions for day-to-day care, enhanced long-term outcomes, and peace of mind. By connecting glucose readings, CGM provides a comprehensive picture of blood sugar levels. CGMs offer features not available with self-monitoring blood glucose alone, such as glucose trend information, rate of change information, and alerts for unwanted glycemic events. With improved accuracy and ease of use, CGMs have become a standard tool for diabetes management for a broad range of patients.

PI-08

Reverse Engineering in Drug Manufacturing

Menna Essam, Aya Elkhatib, Ola Nazeh, Youmna ali, Aya salem, Abdallah attia, Yara yasser Magdy, Dalia Ahmed, Aya hani, Abdulaziz Ali, Mahmoud Ibrahim

Under supervision of:

Prof. Dr. Rehab Ahmed Abdelmonem
Ass. Lec. Mahmoud Ahmed Eltahan

Abstract

Reverse engineering is a critical process in drug manufacturing that involves deconstructing and analyzing existing drug products to understand their composition, structure, and function. The objectives of reverse engineering can include replicating or improving upon an existing drug, conducting competitor analysis, and protecting intellectual property. Analytical methods, including chromatography, mass spectrometry, infrared spectroscopy, and nuclear magnetic resonance spectroscopy, are used to gain insights into the drug product's physical and chemical properties. Formulation methods are used to determine the drug product's formulation, while manufacturing methods analyze the equipment, materials, and processes used to manufacture the drug product. The results of reverse engineering can vary depending on the objectives of the study and the complexity of the drug product. Potential outcomes of reverse engineering include identifying the active ingredient(s), understanding the drug's structure, achieving cost savings, addressing intellectual property issues, and reducing turnaround time. In conclusion, reverse engineering is a crucial process in drug manufacturing that plays a vital role in drug development, quality control, and innovation.

PI-09

Drug Delivery Systems Equipped with Electronic Sensors: Novel Approach in Improving Medication Adherence and Patient Outcomes

Rawan Mohammed Maher, Salma Talaat Attia, Reem Hossam Mohamed, Eman Said Shalaby, Eman Mofreh Nosseir.

Under supervision of:

Prof. Dr. Rehab Ahmed Abdelmonem
Ass. Lec. Mahmoud Ahmed Eltahan

Abstract

Digital pill systems have proven to be safe and effective in addressing nonadherence, with the ID-Cap System being a digital pill system that enables adherence measurement through an embedded ingestible sensor. The sensor, which is biocompatible, sends a digital signal through radio frequency after being ingested and dissolved, and communicates with a reader worn by the patient that forwards ingestion data to the patient app and clinician dashboard. In a validation test, 17 participants were enrolled, and all met the criteria of being patient users. The participants were varied in age, ranging from 27 to 74 years, with a mean age of 51 years. Almost one-fourth of the participants had a high school education, and all reported taking prescription medications orally on a regular basis and using a smartphone. As the healthcare system continues to evolve towards remote care delivery and digital health solutions become more prevalent, systems such as the ID-Cap System that are easy to use, accepted by patients, and effective in achieving health outcomes will become increasingly important.

PI-10

Artificial Intelligence in Pharmaceutical Industry

Yara yasser Magdy, Dalia Ahmed, Aya hani, Abdulaziz Ali, Mahmoud Ibrahim

Under supervision of:

Prof. Dr. Rehab Ahmed Abdelmonem
Ass. Lec. Mahmoud Ahmed Eltahan

Abstract

Artificial Intelligence (AI) appeared as an interference for data and number-related problems. Pharmaceutical manufacturing aims to provide a consistent supply of APIs of high quality. The active pharmaceutical ingredient development process is crucial in achieving this objective. Successful AI projects require accurate data from different sources to predict the necessary raw materials or parts and determine equipment allocation during setup and operations. By analyzing large amounts of data, Artificial Intelligence identifies patterns that help pharmaceutical manufacturers implement good manufacturing practices, leading to efficient and cost-effective production of medicines. AI-powered predictive maintenance solutions analyze the performance of pharmaceutical production lines and offer early warnings for equipment wear and repair needs, resulting in reduced downtime and significant cost savings for manufacturers. Drug manufacture is complex, and careful planning is essential to ensure efficient process monitoring. Some pharmaceutical companies are considering integrating artificial intelligence into their production chain, while others are already investing heavily in AI in Pharma solutions.

Pharmacology and Toxicology

PL-01

Stem Cells in Treatment of Neurological Disorders.

Seham Abd Elkareem Rashed, Sara Ahmed Shehata Keshk

Under supervision of:

Prof. Dr: Naglaa Assaf

Abstract

Stem cells have the remarkable potential to develop into many different cell types in the body. Serving as a sort of repair system for the body, they can theoretically divide without limit to replenish other cells as long as the person or animal is alive. All stem cells regardless of their source have three general properties. They are unspecialized; one of the fundamental properties of a stem cell is that it does not have any tissue- specific structures that allow it to perform specialized functions. They can give rise to specialized cell types. These unspecialized stem cells can give rise to specialized cells, including heart muscle cells, blood cells, or nerve cells. They are capable of dividing and renewing themselves for long periods. Unlike muscle cells, blood cells, or nerve cells –– which do not normally replicate themselves - stem cells may replicate many times. A starting population of stem cells that proliferates for many months in the laboratory can yield millions of cells. Today, donated organs and tissues are often used to replace those that are diseased or destroyed. Unfortunately, the number of people needing a transplant far exceeds the number of organs available for transplantation. Pluripotent stem cells offer the possibility of a renewable source of replacement cells and tissues to treat a myriad of diseases, conditions, and disabilities including Parkinson's and Alzheimer's diseases, spinal cord injury, stroke, Cerebral palsy, Battens disease, Amyotrophic lateral sclerosis, restoration of vision and other neuro degenerative diseases as well.

Microbiology

PM-01

Changes in Radiation Sterilization Process from Gamma Ray to X ray

Dina Mohammed, Laila Khalid, Nourhan Hassan, Roaa Emad, Gehad Alaa, Shahd Mahmoud

Under supervision of:

Prof. Dr. Wael Tawakol

Ass. Prof. Dr. Mohammed Abd Elgawad

Abstract

Numerous studies in biomedical research and several associated fields, in which cells or laboratory animals are exposed to radiation, trust on passable radiation dose standardization for reproducibility and comparability of biological data. Current commercially-available X-ray biological irradiators produce radiation beams with reasonable field geometry and overall dose-homogeneity; however, they operate over a wide range of different energies, both between different models and for a specific unit as well. Gamma sterilization has been used for more than six decades in terminal sterilization of metal orthopedic implants, providing a reliable and efficient process. However, it can alter the material properties of the product and packaging, affecting their functionality and safety. Cobalt-60, used in gamma sterilization, poses legal and normative obstacles for its transport and disposal. X-ray sterilization is a newer method that has similarities with gamma sterilization (photons), but more scientific data are required to understand its impact on product materials and functionality. Any sterilization change can affect the final product's safety and performance, necessitating rigorous biological evaluation and functionality testing.

Organic Chemistry

PO-01

Abstract Title: Review of Targets and Studies of Emodin Against Anti-Cardiovascular Disease

Kholoud Mahmoud Azab, Omar Sayed Ali

Under supervision of:

Prof Dr khadiga Attia

Ass.Prof Abdallah Eletrawy

Dr Amira Atef

Dr Noha Ryad

Dr Aya Alaa

Abstract

Emodin is a natural anthraquinone derivative and is the main ingredient of many herbs. Studies have shown that emodin, as a polyvalent molecule, has a variety of biological functions. Emodin inhibited the expression of tumor necrosis factor (TNF-α) and the activation of NF-kβ in the myocardial infarction by elevating levels of PPAR-Y activity which identified as a cardio-protective factor. miR-223: is considered as a possible target of emodin. It can inhibit the inflammatory response and prevent indirect damage in the process of infection. Emodin has an anti-apoptosis activity which inhibits caspase 3 & caspase 5 are responsible for kill the damaged cells in heart which by fibrosis can't be regenerated and regulates MicroRNA-138 that can protect cardiomyocytes. Studied the sensitivity of emodin in a single dose treatment to mitochondrial ATP production and antioxidant composition in male and female rats and ischemia reperfusion (IR) injury. The results showed that a single dose of emodin can enhance the antioxidant components of mitochondria and prevent IR damage. Emodin observed as anti-myocardial fibrosis by TAC-induced and cardiac fibroblast activation, MTA3 becomes a cancer suppressor and anti-fibrosis effect, Emodin/MTA3 play a vital role in regulating cardiac fibrosis. Pharmacological studies shown the powerful activity of them in treatment of various diseases, and we hope in future, scientists do the best to decrease their side effects and toxicity to discover new derivatives for another disease.

PO-02

Review of: Pyrimidine Derivatives as Anticancer

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Under supervision of:

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Ass. Prof. Dr/ Abdallah shaaban El Etrawy

Dr/Amira Attef

Dr/ Noha Ryad

Dr/ Aya Alaa

Abstract

Cancer is a world-wide health encounter, it influences the excellence of life and its treatment is related with numerous side effects. Resistance of the tumour cells to the current drugs has led to exploration for novel anticancer agents. Pyrimidine, a privileged scaffold, is part of living organisms and plays vital role in various biological procedures as well as in cancer pathogenesis. Due to resemblance in structure with the nucleotide base pair of DNA and RNA, it is recognized as valuable compound in the treatment of cancer. A new series of 1,2,4-oxadiazole linked 4-(Oxazolo[5,4-d] pyrimidine) derivatives were synthesized and evaluated for their anticancer activity towards four human cancer cell lines: breast cancer (MCF-7) *, lung cancer *(A-549) *, colon cancer *(Colo-205) and ovarian cancer *(A2780) *. Most of the screened compounds showed moderate to excellent anticancer activity against all tested cell lines. The compound 1a showed potent anticancer activities against the 4 cell lines MCF-7, A549, Colo-205 and A2780, another compound 1b also had activity against 3 cell lines MCF-7, A549 and A2780.

PO-03

Review of Aspirin

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Abstract

Since more than a century ago, aspirin has been a widely used drug. Although it also has additional medicinal purposes, its analgesic and anti-inflammatory qualities are its main usage. Salicylic acid was used to create aspirin for the first time in the nineteenth century. Aspirin works by inhibiting the cyclooxygenase enzymes that produce prostaglandins, according to its mechanism of action. As a result, there is lessened discomfort, fever, and inflammation. Aspirin does have certain undesirable side effects, such as increased risk of bleeding problems, renal impairment, and gastrointestinal bleeding. Despite these negative effects, aspirin is nevertheless a vital drug for the treatment of a number of illnesses, such as fever, pain, and cardiovascular disease. Generally, Salicylates have been used since antiquity to relieve pain and inflammation. Aspirin became a mainstay of the treatment of inflammatory conditions and of acute pain conditions such as headache. Since its discovery in 1847, it has been used to treat fever and rheumatic pain, to inhibit the formation of thrombocytes, to prevent myocardial ischemia and strokes, and as preventive medication against neoplasms.

PO-04

Review of Propranolol Medication

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Abstract

Propranolol is a beta-adrenergic receptor antagonist, it was not long before several other cardiovascular as well as noncardiovascular therapeutic uses of propranolol were discovered. Propranolol was synthesized from reaction between 1-naphthol and isopropylamine . Typically, 1.25 g of 1-naphthol was dissolved in 10 mL of ethanol : water (9 : 1), followed by adding 0.5 g of KOH into the above mixture stirring for 30 min. Next step, 4 mL of epichlorohydrin was drop-down until the color of the mixture changed to orange-yellow. After every 30 min of the reaction, the formation of propranolol and its derivatives was determined by TLC. The solvent of the reaction mixture was evaporated and the yellow-brown compound of oil form was obtained. Then, 50 mL of diethyl ether was added to the resulting product under shake condition, and The water was removed by Na2SO4. Then, after few more steps Finally, propranolol was collected. We succeed in obtaining propranolol formula. After, conducting many experiments we discovered that Propranolol can be used to ameliorate the sympathetic response in angina, prevention of acute ischemic attacks, migraine prophylaxis, and restless leg syndrome. Propranolol can be used in almost all cases if the desired result is to slow contractility and decrease a patient's heart rate. In conclusion, propranolol is used to treat many diseases especially that is related to the heart. Propranolol can also be prepared by different methods not just the by the method we mentioned earlier.

PO-05

Review of Paracetamol Medication

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Abstract

Paracetamol known as acetaminophen, is a widely used medication with analgesic (pain-relieving) and antipyretic (fever-reducing) properties. It has been extensively studied in various clinical settings to assess its efficacy and safety. This abstract provides a concise overview of the background, methods, results, and conclusion of studies conducted on paracetamol. In terms of background, paracetamol has been used for decades to alleviate pain and reduce fever in both adults and children. Its mechanism of action involves inhibition of prostaglandin synthesis in the central nervous system, leading to pain relief and temperature reduction. The methods employed in these studies typically involve randomized controlled trials or observational studies. Participants are often recruited from diverse populations to ensure generalizability of the findings. Dosages and administration routes may vary depending on the specific research objectives. Results from these studies have consistently demonstrated the effectiveness of paracetamol in managing mild to moderate pain and reducing fever. Adverse effects are generally rare but can include hepatotoxicity when exceeding recommended doses or with concomitant alcohol consumption. In conclusion, paracetamol is a valuable medication for pain relief and fever reduction. However, caution should be exercised regarding dosing instructions to avoid potential adverse effects. Further research may be warranted to explore its use in specific populations or medical conditions.

PO-06

Review of Grafting of N-Vinyl Imidazole onto Sodium Alginate for Enhanced Antimicrobial Activity

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Abstract

The antimicrobial activity of sodium alginate and its copolymers were investigated in this study. N-Vinyl imidazole was successfully grafted onto sodium alginate (PNVI-g-NaAlg) using a free radical polymerization technique in an aqueous solution with potassium persulfate (K2S2O8, KPS) as the initiator material. The grafting process was carefully optimized to achieve a high percentage yield of the poly (N-vinyl imidazole)-grafted alginate copolymer. Sodium alginate, a natural anionic polysaccharide extracted from brown seaweed, possesses abundant hydroxyl and carboxyl groups along its backbone chain. Characterization of the prepared grafted copolymer, NaAlg-g-PNVI, was performed using various techniques including Fourier-transform infrared spectroscopy (FT-IR) and thermal analysis. Scanning electron microscopy (SEM) was used to observe changes in the surface morphology of sodium alginate after grafting N-Vinyl imidazole, confirming the alteration in morphology following the grafting process. The antimicrobial activity of both the original sodium alginate and the grafted copolymer, NaAlg-g-PNVI, was evaluated. The results demonstrated excellent improvement in the antimicrobial biological activity of the alginate upon grafting, as evidenced by its enhanced antimicrobial activity against Gram-positive bacterium Bacillus subtilis, Gram-negative bacteria E. coli and Neisseria gonorrhoeae, and Candida albicans. The grafted copolymer exhibited a lower rate of degradation and demonstrated improved antimicrobial activity compared to native alginate. The findings support the hypothesis that the enhanced antimicrobial activity may be attributed to changes in cell permeability due to the connections between sodium alginate and the electronegative charges on microbial cell surfaces. Additionally, other directions for antimicrobial activity were detected through microbial DNA.

PO-07

Review of Tolcapone Medication

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Dr. Aya Alaa

Abstract

In this abstract we going to review some information about Tolcapone : The common background about Tolcapone that is inhibits the enzyme catechol-O-methyl transferase (COMT). It is used in the treatment of Parkinson's disease as an levodopa / carbidopa medication. Tlcapone is a catechol-O-methyltransferase (COMT) inhibitor. Levodopa, a common medication used for Parkinson disease, is normally metabolized by decarboxylase in the periphery to dopamine. Therefore, levodopa is typically administered with a decarboxylase inhibitor like carbidopa to increase the amount of levodopa that reaches the brain and to decrease adverse effects caused by dopamine when produced in the periphery. However, when decarboxylase becomes inhibited by carbidopa, levodopa is metabolized by COMT in the periphery. Therefore, by inhibiting COMT, tolcapone further decreases the degradation of levodopa in the periphery, which allows more levodopa to reach the brain and potentially allows for a decrease in the dosage of levodopa. In our studies research and clinical trials have demonstrated the effectiveness of the drug as an aid in the treatment of Parkinson's disease , and it may have some side effect that happens in low percentage such as : Involuntary movements , Nausea , Sleep problems , Muscle contractions and cramps , Diarrhea and these sides effectit can treat easily. In conclusion tolcapone is inhibitor used as adjunct Therapy in the symptomatic management of idiopathic Parkinson's disease . It should not be taken without a prescription , It must always be patient consulting a doctor to avoid complications

Clinical Pharmacy Practice

PP-01

Study the Effect of Pharma-Jelly as A New Delivery System for an Easy Drug Administration and Hydration Improvement in Dementia Patients (elderly)

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Dr Dina Khaled

Dr Michael Tadros

Abstract

We hope to accomplish a better quality of life for suffering patients, especially dementia patients, and problems faced in taking medication or getting hydrated, and end everything caretakers' daily struggle. Longitudinal methodology with the use of active control groups (prospective study).The objective of this study is to assess the feasibility of offering dementia patients the drug in a creative way due to their unwillingness to receive any medications especially orally, this struggle often extends to the degree that they refused to drink water leading to sever dehydration. To assess response burden and observational intake. New delivery system (pharma jell) which either contains water for hydration or drug dissolved in water of lining coat .Elder people with dementia.30 elderlies (15 suffering from a disease beside dementia and 15 with dementia only). 6 months to 1 year. In conclusion, we believe that with commitment, passion, creativity, education, and optimism. Our work will be focused on ensuring that all our products, including Pharma-Jell, are not only known commercial names but truly products that improve the quality of life for suffering patients. The value of Pharma-Jell is that it will provide patients with dementia a method that enables them to take medications smoothly and comfortably without any unpleasant taste or inconvenience that was preventing them from taking their medications, which will improve their health.

PP-02

Review of The Use of Liraglutide in Obesity Management: Efficacy, Safety, and Considerations

Presented by:

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Abstract

The prevalence of obesity in Egypt has reached alarming levels, with significant implications for public health. This research aims to investigate the use of liraglutide, a medication approved for obesity treatment, in managing obesity. The study aims to analyze its effectiveness, potential adverse effects, and risk factors associated with liraglutide use. Clinical trials, studies, and expert opinions were examined to provide a comprehensive analysis of the benefits, limitations, adverse effects, and risk factors associated with liraglutide use in obesity management. Liraglutide, specifically Saxenda, has shown efficacy in managing type 2 diabetes and insulin resistance. It exerts its effects by regulating appetite, delaying gastric emptying, enhancing insulin secretion, and influencing reward pathways in the brain. These combined effects contribute to reducing food intake, increasing satiety, improving blood sugar control, and reducing cravings for high-calorie foods, ultimately aiding in weight loss. While liraglutide, particularly Saxenda, demonstrates efficacy in managing type 2 diabetes, it is important to consider its limitations and potential adverse effects when used for obesity management. Nausea, vomiting, diarrhea, and constipation are common but usually mild side effects that diminish over time. Precautions should be taken in individuals with a personal or family history of thyroid cancer and multiple endocrine neoplasia syndrome type 2. Additionally, liraglutide has specific interactions with other medications, necessitating awareness of potential drug interactions. Patient education and the involvement of clinical pharmacists are crucial in ensuring safe and effective treatment.

Pharmaceutics

PT-01

A Brief Review on Tissue Engineering

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Abstract

Tissue engineering goals to construct purposeful biomaterials for the repairmen and renewal of imperfect tissue. In addition to the structural simulation for accelerating the repair process and achieving a high-quality regeneration, the combination of biomaterials and bioactive molecules is required for an ideal tissue-engineering scaffold. Due to the diversity in materials and method selection for electrospinning, a great flexibility in drug delivery systems can be achieved. Tissue engineering (TE) is a branch of pharmaceutical engineering which helps in improving methods of drug delivery (Khan MG et al., 2018). Controlled release is a growing field for tissue engineering that seeks new ways to improve 3D microenvironment provided by material scaffolds and to stimulate molecular signalling of cells within these microenvironments. Polymeric porous scaffolds play a critical role in TE strategies for providing a favourable environment for tissue restoration and establishing the interaction of the biomaterial with cells and inducing substances (Lim, D. et al., 2022).

PT-02

A Brief Review of Nanorobots and Their Applications

Fatma Elgazzar

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Dr. Rania Mostafa

Abstract

Nanotechnology is s a widely expected field of science, as one of the foremost technologies of the 21st century. It measured a novel and fast developing area in the pharmaceutical and medicinal field. Nanoparticles, as drug delivery systems, impart several compensations regarding better efficacy as well as reduced adversative drug reactions. It covers a very wide field in modern science. The sphere of nanotechnology in the pharmaceutical industry is very wide, and it finds application in various fields, such as tissue engineering, nanotechnology, diagnostic tools, image enhancement devices, nanorobots, implant technologies, biosensors, biomarkers, biologically active surfaces and as carriers of diagnostic and therapeutic methods.Nanotechnology through nanorobotics offers enormous advantages over the conventional methods for diagnosis and treatment, precisely because of the knowledge gained from converging domains like molecular biology, mesoscopic/ supramolecular chemistry, and mesoscopic physics at the nanometer scale. Reliable applications for nanorobotics in the medical field include early diagnosis and targeted drug delivery for cancer, pharmacokinetics monitoring of drug delivery, ophthalmology, and many others.

Conference Recommendations

Conference Recommendations:

1- Pharmacists are an integral part of the healthcare system and should be involved in all aspects of health care sustainability to help achieve Egypt's vision for Health in 2030.

2- Achieving sustainable development goals in healthcare requires diversity among healthcare professionals and creating new opportunities for pharmacists beyond their traditional roles as supply chain management, health economics, and pharmacoepidemiology.

3- Incorporating sustainability and innovation into pharmacy education curriculums could enhance pharmacists' capacity building by improving their soft and digital skills, enabling them to use technology to solve problems in the pharmacy profession.

4- Greening pharmacy education means replacing existing practices with sustainable alternatives, to achieve these we should explore increasing research opportunities focusing on Pharmacoeconomics, and personalized medicine using bioinformatics and genealogy, and partnering with national organization to improve patient safety and drug efficacy.

5- Reduce the environmental impact by reducing medication waste in which pharmacogenomics can help reduce the environmental impact of pharmaceutical production and disposal. This can include reducing the use of raw materials, energy, and water in drug production, as well as reducing the amount of medication that is discarded and harmful to the environment.

6- Encourage the research of multidisciplinary, intradisciplinary, and interdisciplinary such biopharmaceutical research and biosimilars.

7- Adding a student project exhibition to ICPS-3 next year.

8- Transfer the traditional research into application achieving the SDGs.

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