magnus Group

14-15 SEPTEMBER, 2023

ONLINE EVENT

10TH EDITION OF
GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

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BOOK OF ABSTRACTS

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ABSTRACTS

10TH EDITION OF
GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

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Ludwig Maximilians Universitat Munich, Germany

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Autonomous University of Baja California, Mexico

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Mujde Eryilmaz
Ankara University, Turkey

Thomas J Webster
Hebei University of Technology, China

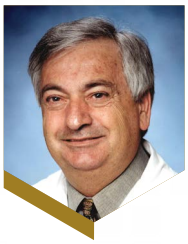
Miroslav Radenkovic
University of Belgrade, Serbia

Thank You All...

Speakers

Ali Yetgin
Cukurova University, Turkey

Andrea Stierle
Montana State University, United States



Andreas M Papas
East Tennessee State University and Antares Health Products, Inc. United States

Asit Kumar Chakraborty
Vidyasagar University, India

Danuta Drozdowska
Medical University of Bialystok, Poland

Delia Teresa Sponza
Dokuz Eylül University, Turkey

E. T. Krishnan Mooss
Vaidyaratnam Group, India

Eman Ramada
Helwan University, Egypt

Franz Josef Meyer Almes
University of Applied Sciences, Germany

Geetanjali Sageena
Indian Council of Medical Research, India

Gurpreet Singh
Freyr Lifesciences Limited, United Kingdom

Juan Gu
Affiliated Hospital of Zunyi Medical University, China

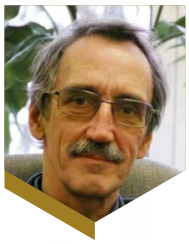
Kalirajan Rajagopal
JSS College of Pharmacy, India

Liberata Sportiello
University of Campania "L. Vanvitelli", Italy

Maria Borrell
IIB-Sant Pau, Spain

Nikola Matejkova
University of Pardubice, Czech Republic

Speakers



Nikolay Polyakov
Voevodsky Institute of Chemical Kinetics and Combustion, Russian Federation

P.K.Suresh
VIT University, India

Panagiotis Mallis
Biomedical Research Foundation Academy of Athens, Greece

Preeti Sharma
Autonomous State Government Medical College, India

Rajesh Kumar
B.R.A. Bihar University, India

Ravi P. Sahu
Wright State University, United States

Rudra Pratap Singh Rajput
Royal College of Pharmacy, India

SaadTayyab
UCSI University, Malaysia

Tarek Aboul-Fadl
Assiut University, Egypt

Vandana B. Patravale
Institute of Chemical Technology, India

Wayne Kaesemeyer
Augusta Hypertension PC, United States

Zinnet Şevval Aksoyalp
Izmir Katip Celebi University, Turkey

Welcome Message

Dear participants of the “10TH EDITION OF GLOBAL CONFERENCE ON PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS” (PDDS 2023) welcome you all.

In this congress experts of all pharmaceutical related fields will be gathered to share advances, innovation along with the major difficulties encountered along the way. Even being an on-line event, this exchange of experiences and knowledge will represent a significant step in the contribution to overcome the main challenges and start new collaborations and international cooperation.

Dr. Andreia Freitas

INIAV - Vila do Conde, PORTUGAL

ABOUT
MAGNUS GROUP

Magnus Group (MG) is initiated to meet a need and to pursue collective goals of the scientific community specifically focusing in the field of Sciences, Engineering and technology to endorse exchanging of the ideas & knowledge which facilitate the collaboration between the scientists, academicians and researchers of same field or interdisciplinary research. Magnus Group is proficient in organizing conferences, meetings, seminars and workshops with the ingenious and peerless speakers throughout the world providing you and your organization with broad range of networking opportunities to globalize your research and create your own identity. Our conferences and workshops can be well titled as 'ocean of knowledge' where you can sail your boat and pick the pearls, leading the way for innovative research and strategies empowering the strength by overwhelming the complications associated with in the respective fields.

Participation from 90 different countries and 1090 different Universities have contributed to the success of our conferences. Our first International Conference was organized on Oncology and Radiology (ICOR) in Dubai, UAE. Our conferences usually run for 2-3 days completely covering Keynote & Oral sessions along with workshops and poster presentations. Our organization runs promptly with dedicated and proficient employees' managing different conferences throughout the world, without compromising service and quality.

ABOUT
PDDS 2023

Magnus Group is delighted to extend a warm invitation to the 10th Edition of Global Conference on Pharmaceutics and Novel Drug Delivery Systems, which will be held virtually from September 14-15, 2023. The central theme for this year's congress is "Confronting Global Issues and Exploring Scientific Inquest on Pharmaceutics."

This international summit continues the tradition of facilitating collaboration and providing access to cutting-edge scientific insights, recent trends, and innovations in the field of Pharmaceutics and Drug Delivery Systems. With the notable progress in pharmaceutical innovation, this occasion provides an opportunity to explore groundbreaking technologies, fresh ideas, and approaches aimed at improving productivity and efficiency in drug and biomedical research and development.

Over the course of two days, attendees can expect engaging sessions, interactive discussions, oral and poster presentations, as well as enlightening keynote talks. This congress is designed to foster collaboration and drive innovation in the field, offering an invaluable opportunity to connect with scientists from around the world and gain insights on advancing pharmaceuticals from research to market. Join us at PDDS 2023 and be part of this transformative experience!

BOOK OF ABSTRACTS

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14-15 SEPT

DAY 01

KEYNOTE FORUM

10TH EDITION OF
GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

Manufacturing outlook on cell and gene and aseptic processing according the EU GMP Annex 1

The new EU GMP Annex 1 for sterile Manufacturing was published in August 2022. The industry does now have one year time for implementation. Exception loading and unloading for the Lyophilization which provides an implementation time of two years. What does this mean for sterile Manufacturing but also for the Manufacturing of Cell and Gene Products. For Cell and Gene (ATMPs) the PIC/s published in 2021 the Annex 2A for ATMPs and it might be that PIC/s link their Annex 1 with the Annex 2 A which would mean higher requirements also for the manufacturing of ATMPs. The presentation will be focused on Contamination Control Strategy, Barrier Systems as those on of the major new areas to consider.

Audience Take Away Notes

- Comparison between EU GMP Annex 1 and PIC/s Annex 2A
- What to consider when implementation a CCS
- What is the right Barrier Solution for my process

Richard Denk

Richard Denk, Senior Consultant Aseptic Processing and Containment, SKAN AG, Allschwil, Switzerland

Biography

Richard Denk is working at the company SKAN AG, headquartered in Allschwil in the position Senior Consultant Aseptic Processing & Containment. Richard is member of the PDA Isolator Expert Group and publisher of the PDA Paper “Isolator Surfaces and Contamination Risk to Personnel and Patient”. Furthermore, Richard is Member of the ISO TC 198 WG-9 Aseptic Isolator Group. Richard was on the Annex 1 and PIC/s Annex 2 commenting team of the ISPE, Richard founded 12 years ago the Containment expert group of the ISPE D / A / CH. The Containment Group published the Containment Manual Richard was responsible for in September 2015. Richard has spent more than 20 years with the subject on Aseptic Processing and highly active / highly hazardous substances and has developed the containment pyramid.

Multi-detection of pharmaceutical contamination in environment

The constant release of veterinary and human pharmaceutical drugs as active compounds or metabolites to the environment, can result in the presence of undesirable contaminants in the ecosystems. Such anthropogenic contaminants can be discharged into the environment through wastewater treatment plants, overflows from intensive food animal production or even by the use of uncontrolled manure in agriculture crops. Nowadays, pharmaceutical drugs are considered to be emerging pollutants of global concern due to the undesirable negative effects that can cause to human, animal and environment health, in a One Health perspective. One of the major examples of the negative consequences is related with the development and spread of antimicrobial resistant bacteria strains which can be correlated with the excessively and reckless use of antibiotics. To analyse and quantify the occurrence of those anthropogenic contaminants, environmental matrices, such as water, algae and sediments can be used as contaminant bioindicators. The described matrices were selected as matrices of choice to evaluate the levels and principal sources of contaminations.

The analytical strategy relies on the use of multi-detection and multi-class methods, based on ultra-high-performance liquid chromatography coupled with high resolution mass spectrometry detector, time-of-flight. The methods developed were validated to access the presence of pharmaceutical compounds in water, algae and sediments. Those analytical tools are able to detect and quantify more than Sixty compounds from various family drugs, including antibiotics, anti-inflammatory, psychiatric, antidepressants and anticonvulsants drugs, can be detected and quantified using the presented methods. The validation parameters, Limit of Detection (LoD), Limit of Quantification (LoQ), precision, recovery, linearity, selectivity and specificity were studied, and the applicability of the methods were proved.

Audience Take Away Notes

- Understand the problematic of excessive use of pharmaceuticals
- Provide knowledge about the analytical advantages that can be used to control environmental contamination
- Present validation of analytical methods to analyze pharmaceutical drugs in different matrices

Andreia Freitas[1,2]*, Marta Leite[1,2,3], Sara Leston[4]

[1]National Institute for Agricultural and Veterinary Research (INIAV), Rua dos Lagidos, Lugar da Madalena, 4485-655 Vila do Conde, Portugal

[2]REQUIMTE/LAQV, R. D. Manuel II, Apartado 55142, Oporto, Portugal

[3]University of Coimbra, Faculty of Pharmacy, Health Science Campus, Azinhaga de Santa Comba, 3000-548 Coimbra, Portugal

[4]Centre for Functional Ecology), University of Coimbra, Coimbra, Portugal

Biography

Andreia Freitas studied Chemistry in the Instituto Superior Tecnico (IST), Lisbon, and graduated as MS, in Analytical Chemistry (2008) at the same institution. She received her PhD degree in Pharmaceutical Sciences (2015), specialty of Bromatology and Hydrology at the Faculty of Pharmacy, University of Coimbra. With more than 18 years of experience, she is currently a researcher in the field of Food Safety specially in the area of veterinary drug residues analysis and contaminants in food of animal origin in the Nacional Institute of Agrarian and Veterinary Research (INIAV) in the National Reference Laboratory for Food Safety.

Synergism in the permeability of the blood brain barrier between heavy metals and electromagnetic fields

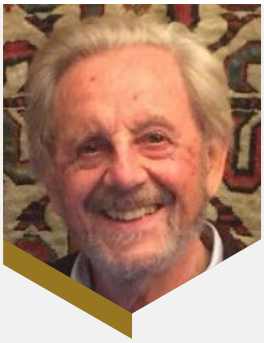
The blood-brain barrier protects the brain from certain ions, molecules and medicaments from its action and toxicity like the clouds the earth biosphere and its climate. Our thoughts induce neuron stimulation through synaptic activity, chemical reactions, electron movement, electric fluxes in the central nervous system, and also in metabolism by glucolysis and the electron transfer chain. These electron flow creates electromagnetic fields in the human body.

Biological effects produced by heavy metals could be enhanced by the presence of magnetic fields pollution wireless physical and medical devices, antennas and cellular phones, high tension electric power and domestic engines. Food is a way of a heavy metal ions ingestion like Cd^{2+}, Hg^{2+} and Pb^{2+} and other pollutants which after application to rats and mice have higher influence on the tissues physical dielectric properties as conductivity and permittivity, showed in this work in rats and mice. This work will scientifically justify the effects by the interference of high external intensity EMF on the chemical reactions of the electron transport chain applying the enzymatic reactions of the complex 1 to 5, the citrate synthase. BALB/c male mice are submitted to different treatments with urea and mercury and exposed to ELF-MF (7 days, 27 Gauss at 50 Hz) in comparison to control animals. Blood brain barrier permeability is showed through dorsal queue vein administration of 0.2mg neutral red colorant and its spectrophotometric determination in brain extracts to 540 nm.

It is observed a statistically significant difference ($p < 0.05$) between the control and all other groups treated with urea, mercury and between both compounds urea and mercury. ELF-MF increases the permeability of the blood brain barrier lower than the exposure to mercury ions. Chemical pollutants induce higher BBB permeability than electro magnetic fields.

Audience Take Away Notes

- It is observed a statistically significant difference ($p < 0.05$) between the control and all other groups treated with urea, mercury and between both compounds urea and mercury. ELF-MF increases the permeability of the blood brain barrier lower than the exposure to mercury ions. Chemical pollutants induce higher BBB permeability than electro magnetic fields
- Prevention to pollutants as heavy metals and electromagnetic fields from own households apparats, not to be near in its function
- It will helpful for the audience in their job
- Yes, this research that other faculty could use to expand their research or teaching



Ribas Ozonas B[1,2]*, Garcia Arribas O[2], Perez Calvo[2], Sebastian Franco J L[3], Miranda J M[3], Munoz S[3]

[1]Royal National Academy of Pharmacy, Institute of Spain

[2]Institute of Health Carlos III, Majadahonda, Madrid

[3]Department of Applied Physics, Faculty of Physics, Complutense University, Madrid, Spain

Biography

Ribas Ozonas B was Doctor In Pharmacy and extraordinary Price. Graduate in Medicine and Surgery Univ. Madrid. Courses in France. Humboldt Researcher in Germany Head Area of Toxicology in Health Ministry and professor in various Faculties. Invited Professor in the Clinical Chemistry Department, Connecticut University, USA. Expert of the European Unión (E-44.386-N) Research projects and Grants (CSIC-Spain and CNPq-Brasil), European Community, Hahn Meitner Institute Berlin, and utilization great installations of the E.U. Lecturer in diverse Research institutions: Paris, Lyon; Strasbourg, Connecticut, Munich; Botucatu, Araraquara and Bauru, Brazil, Taiwan; Italy. Academician of numerous Academies Peru; Bulgaria, Spain. Brazil and Argentina. Diverse prices. Published more than 200 articles, 10

- Yes, this provide a practical solution to a problem that could simplify or make a designer's job more efficient
- Yes, it improve the accuracy of a design, or provide new information to assist in a design problem

book chapters, and more than 100 Congress Communications. Delegate to WHO, OCDE and others. Treasurer and General Secretary of the Royal National Academy of Pharmacy of Spain.

Digital health: Education in clinical pharmacy and implementation in practice

The outbreak of coronavirus disease 2019 increased the use of technology, especially in the health care sector, which experienced enormous pressures to provide patients' health needs. Due to the outbreak measures such as physical distancing or self-isolation, many patient consultations or follow-ups were not done and thus health care providers and patients sought alternative approaches to continue the care. With these reasons, acceptance and adaptability of digital health technologies by health care providers and patients increased. In clinical pharmacy practice, there are several studies about the use of various digital health technologies to provide pharmaceutical care, health education, chronic disease management, and medication review. Telemedicine, telepharmacy, artificial intelligence, mobile and wearable health technologies and electronic health records are the common examples used as digital health tools in clinical pharmacy practice. Digital health tools play an important role in integrated care, especially in managing chronic diseases, delivering precision medicine and increasing medication adherence for patients. They also overcome issues by providing more accessible, standardized, relevant, timely, and affordable medical education and training for health care providers. However, using digital health tools requires knowledge, skills, competency and confidence. To use the full potential of digital health, students and practitioners must gain the necessary knowledge and skills. Therefore, pharmacy schools either developed new programs or integrated the topics into the existing courses to teach digital health to pharmacy students. Online pharmacies, mobile applications and telemedicine are the most common examples thought of as digital health tools in clinical pharmacy education. Educational programs are heterogeneous, similar to the applied digital health tools in practice. There is no standardized approach to teach digital health in terms of program content and educators as well as to implement digital health programs in terms of tools and appliers in practice. Besides challenges to implement digital health in clinical practice and teach in pharmacy education, clinical pharmacy can no longer wait or slow down to use digital health because of its greater benefits.

Audience Take Away Notes

- Define what digital health is
- What the common digital health tools used in clinical pharmacy practice are and how they are being used
- How pharmacy schools teach digital health
- List the limitations and issues to use and educate digital health

Aysu Selcuk

Department or Clinical Pharmacy, Faculty of Pharmacy, Ankara University, Ankara, Turkey

Biography

Dr. Aysu Selcuk is a lecturer at the Department of Clinical Pharmacy, Faculty of Pharmacy, Ankara University, Turkey. She is also Education and Primary Health Care Policies Specialist at the International Pharmaceutical Federation (FIP). She obtained BSc (Pharmacy) from Ankara University with the rank 3 out of 200 students. She has a PhD degree in antimicrobial stewardship in nursing homes from the National University of Singapore. She is associate editor of the Journal of Faculty of Pharmacy of Ankara University. Her scientific interests are antimicrobial stewardship, innovations in clinical pharmacy education, geriatrics, continuing professional development and primary health care. She has several scientific articles, toolkits, and book chapters published.

The role of non-antibiotic drugs on the development of antibiotic resistance

Antibiotics are essential and versatile drugs due to the necessity of their use in cases such as surgical procedures, organ transplantations, and the treatment of cancer patients. However, due to the increasing rates of antibiotic resistance in recent years, there has been a failure in treating infectious diseases. Antibiotic resistance is one of the most serious global public health problems. Many scientific authorities describe antibiotic-resistant infections as a hidden, silent, and quietly progressing pandemic. Worldwide, 750,000 people die each year due to antibiotic-resistant infections. If required precautions are not taken, it is estimated that this number will reach 10 million people per year by 2050. In addition to the inappropriate use of antibiotics in humans and animals for therapeutic purposes, the unnecessary usage, especially in the food and agricultural sectors for economic reasons, is among the most important reasons for the increase in antibiotic resistance. When the increasing rates of resistance are considered, the preventive actions taken on a global scale to tackle the consumption of antibiotics are insufficient to control the problem. Thus, more holistic approaches are required to solve this problem.

Studies conducted in recent years have reported that some non-antibiotic drugs might also have a role to play in promoting antibiotic resistance. Antidepressants are among these drugs. Other than their essential therapeutic effects, the antimicrobial activities of certain antidepressants have also been reported. Studies conducted in the past several years showed that fluoxetine and sertraline have antibiotic-modulating activities as well as antimicrobial activities. It is also indicated that anti-inflammatory and lipid-lowering drugs can accelerate the spread of antibiotic resistance. It should be noted that the long-term use of non-antibiotic drugs may affect both the human microbiome and environmental microorganisms due to their accumulation in the environment via their improper disposal and contamination into wastewater, respectively. The response of microorganisms to the chemical changes in their environment has been among the important study topics for a long time. However, data on how the environmental changes causing stress conditions to microorganisms can contribute to antimicrobial resistance have yet to be revealed. Phenotypic and genotypic analyzes to elucidate resistance mechanisms with non-antibiotic drug groups, which are used in long-term for treatments, are needed to obtain more data.

Audience Take Away Notes

- Antibiotic resistance is considered to be the next global pandemic. In the fight against antibiotic resistance, precautions have always been taken to consume antibiotics. However, the possibility that non-

Mujde Eryilmaz

Department of Pharmaceutical Microbiology, Faculty of Pharmacy, Ankara University, Ankara, Turkey

Biography

Mujde Eryilmaz is an Associate Professor of Pharmaceutical Microbiology at the Faculty of Pharmacy, Ankara University, Turkey. She was a trainee at the Division of Microbiology and Immunology, Department of Pathology, Montefiore Medical Center, Albert Einstein College of Medicine, New York-USA, between May-September 2004. Her scientific studies focused on infection prevention and control, antimicrobial resistance, new antimicrobial substances, antimicrobial susceptibility testing, and bioactive secondary metabolites. She has published more than 40 scientific articles and two book chapters. She is a member of the Microbiology Commission of Turkish Pharmacopoeia (Republic of Turkey Ministry of Health, Turkish Medicines and Medical Devices Agency). She was also a member of the organizing committees of the "11th International Symposium on Pharmaceutical Sciences (ISOPS-11), Ankara, Turkey, June 9-12, 2015" and "12th International Symposium on Pharmaceutical Sciences (ISOPS-12), Ankara, Turkey, June 26-29, 2018".

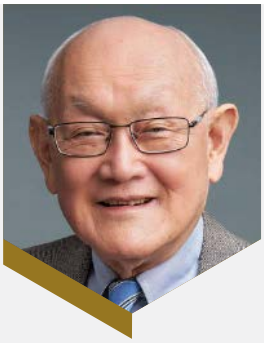
antibiotic drug groups, especially with long-term use, may play a role in developing resistance has not been considered. In this presentation, I will talk about the importance of the antibiotic resistance pandemic and the role of non-antibiotic drugs on the development of antibiotic resistance. We are a group studying "the effects of non-antibiotic drugs on the development of antibiotic resistance." I will share some of our published research results in my presentation

New approach to hyponatremia yields high prevalence and identification of natriuretic protein that causes Renal Salt Wasting (RSW) and new syndrome of RSW in alzheimer's disease

The approach to hyponatremia is in a state of flux, especially in differentiating syndrome of inappropriate secretion of antidiuretic hormone (SIADH) from cerebral-renal salt wasting (RSW) because of diametrically opposite therapeutic goals of water-restricting in SIADH and administering saline in RSW. We differentiated SIADH from RSW by utilizing an algorithm based on fractional excretion (FE) of urate and failure of isotonic saline infusions to dilute the urine or correct the hyponatremia in SIADH as compared to excretion of dilute urines and correction of hyponatremia in RSW. We also identified the natriuretic factor we previously demonstrated in neurosurgical patients with RSW and in Alzheimer's disease (AD).

Results: Of 62 hyponatremic patients, (A) 17 patients (27%) had SIADH, 11 were nonresponsive to isotonic saline, and 5 normalized a previously high FEurate after correction of hyponatremia; (B) 19 patients (31%) had a reset osmostat based on normal FEurates and spontaneously excreted dilute urines; (C) 24 patients (38%) had RSW, 21 had no clinical evidence of cerebral disease, 19 had saline-induced dilute urines; 2, 10 required D5W to prevent rapid increases in serum sodium to prevent osmotic demyelination, 11 had persistently increased FEurate after correction of hyponatremia. (D) 1 patient had Addison disease with a low FEurate and (E) 1 patient (1.6%) had hyponatremia due to hydrochlorothiazide. We identified haptoglobin related protein without signal peptide (HPRWSP), the first potent inhibitor of proximal tubule sodium transport, as the natriuretic factor in a patient with RSW and in AD.

Conclusions: RSW is much more common than is perceived with 21 of the 24 patients with RSW lacking evidence of cerebral disease, supporting our proposal to change cerebral salt wasting to RSW. HPRWSP can serve as a biomarker for RSW to simplify diagnosis of RSW on first encounter, direct proper therapy, improve clinical outcomes and identifying a new syndrome of RSW in AD. HPRWSP will more effectively treat congestive heart failure when combined with a distal diuretic.



John K Maesaka

NYU Long Island School of Medicine, United States

Biography

John Maesaka is presently professor of medicine at the NYU Long Island School of Medicine and Chief Emeritus of the Division of Nephrology and Hypertension at the NYU Langone Hospital Long Island. He was born in Hawaii, received a BA degree from Harvard University, an MD degree from the Boston University School of Medicine and trained at Barnes Jewish Hospital at Washington University in St. Louis and the Mount Sinai Hospital and Medical School in New York. He also spent 5 years exclusively in the physiology laboratory at Mount Sinai Medical Center, which prepared him well for his future research endeavors. He has spent many years studying hyponatremic conditions, especially renal salt wasting and identifying the protein that causes it.

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14-15 SEPT

DAY 01

SPEAKERS

10TH EDITION OF
GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

Juan Gu[1]*, Si Jia Li[1], Anyong Yu[2], Zhouxiong Xing[3], Jing Kong[1], Jianwen Yang[1], Yu He Wang[1]

[1]Department of Pharmacy, Affiliated Hospital of Zunyi Medical University, Zunyi, China

[2]Department of Emergency, Affiliated Hospital of Zunyi Medical University, Zunyi, China

[3]Department of Critical Care Medicine, Affiliated Hospital of Zunyi Medical University, Zunyi, China

Prescription of potentially inappropriate medicines and comparison with lists of essential medicines for treatment of chronic disorders in older patients

My presentation will be divided into three parts. Firstly, I aim to introduce the background of potentially inappropriate medicines and highlight the pertinent problem that requires resolution. Subsequently, I will introduce a potential solution based on recent research progresses. Finally, I will make a heartfelt appeal to experts worldwide to take collective action to promote the proposal into action.

Objectives: To examine the current situation of Potentially Inappropriate Medicines (PIM) for treatment of chronicity in older patients and whether the inappropriate medicines were included in the 22nd World Health Organization (WHO) Model List of Essential Medicines (EMLs), China National Model list of Essential Medicines (China EMLs), or supplementary list of essential medicines in Guizhou Province 2018 (Guizhou EMLs) through real-world data, so as to promote the development of lists of essential medicines suitable for older patients and provide a reference for the revision of lists of essential medicines to reduce adverse effects, drug-induced diseases and even possible death due to use of inappropriate medicines existing in lists of essential medicines.

Methods: A retrospectively study was conducted. Dispensing records of patients aged ≥ 65 admitted to convenience clinic of a tertiary hospital from January 1, 2021 to December 31, 2021 were extracted through electronic information system. Then, we merged dispensing records of the same patient on the same date as one record and patients with at least one chronic disease were included. The American Geriatrics Society (AGS)/Beers Criteria 2019 (Beers 2019) was used to evaluate the PIM status. Thereafter, the inappropriate medicines were compared with WHO EMLs, China EMLs, and Guizhou EMLs to find out percentages of drugs of PIMs existing in above lists of essential medicines in all drugs of PIMs. The above evaluation was conducted using Excel software (version 2019).

Results: A total of 5314 dispensing reports were included in this study. 5.95% (316/5314), 7.88% (419/5314) of PIMs met Table 2 (medicines that are potentially inappropriate in most older adults), Table 4 (medicines that should be used with caution) of Beers 2019, respectively. Among PIM drugs which met Table 2 of Beers 2019, 47.37%, 78.95%, and 78.95% were respectively included in WHO EMLs, China EMLs, and Guizhou EMLs, and that was 47.06%, 76.47%, and 82.35% for Table 4 of Beers 2019.

Conclusions: PIM in older patients is common in clinical practice. Patients with diabetes, hypertension, arthritis, depression and/or anxiety and Parkinson' diseases were more frequently prescribed drugs of PIM according to Beers 2019. Take older patients into consideration and formulate List of essential medicines special for older patients may be a key way to reduce PIM.

Audience Take Away Notes

- A potential solution to mitigate potentially inappropriate medicines in older patients
- This research could be used by other faculty to expand their research or teaching

- It will provide new information to assist in designing research related to mitigating potentially inappropriate medicines in older patients

Biography

Dr. Juan Gu completed her PhD. in clinical pharmacy from Sichuan University, China in 2018. She has her Master's in pharmacology in 2010 and Bachelor's in Medicine in 2007. She worked as a clinical pharmacist and a neonatologist and now she works as a full-time clinical pharmacist in Affiliated Hospital of Zunyi Medical University where her main duties include providing suggestions and checking prescriptions to patients with infectious diseases as well as chronic diseases. Besides, she's tutoring two graduate students majoring in clinical pharmacy. She has published 19 research articles in SCI(E) journals.

Gurpreet Singh[1]*, Punam Kumari[2]

[1]Vice President, Global Head of Pharmacovigilance, Freyr Solutions, United Kingdom

[2]Currently Pursuing Master's Pharmacology and Drug Development, Coventry University, United Kingdom

Pharmacovigilance – important, current trends, challenges and opportunities

Pharmacovigilance is the Detection, Assessment, Understanding and Prevention of Adverse Events associates with Drugs. Over the last 2 decades there has been an increased focus on Pharmacovigilance in order to ensure Patient Safety. The Health Authority requirements for a Marketing Authorisation Holder (MAH) to be complaint to Pharmacovigilance has ensured better and more efficient processes in the Pharma Organisation.

However there is a need to be more efficient not only in the processes but also in terms of the manual efforts required to perform PV activities. This presentation will talk about the current trends in Pharmacovigilance with respect to Digital Transformation and Process Excellence. We are at the cusp of Digital Disruption in PV and we have a tremendous opportunity to handle PV more efficiently.

Audience Take Away Notes

- The growing importance of Pharmacovigilance and the need to ensure Patient Safety
- Challenges currently faced by the Industry
- Opportunities in terms of
- Digital Transformation (including RPA, AI, Machine Learning)
- Process Excellence (Six Sigma, Quality Management and Lean Methodologies)
- Project Management (Operations, Transition and Revenue)

Biography

Gurpreet Singh is currently the Vice President, Global Head of Pharmacovigilance at Freyr. He is based in UK and has a total of 17+years' experience in Pharma Industry of which 16+ years have been in Global Drug Development. During these years he has had the opportunity to work with some top Global companies like Cognizant, Tata Consultancy, Novartis and Parexel. At Novartis he was the Global Head of PV Operations managing all Global PV activities. At Parexel he was the Senior Director PV Operations responsible for managing PV projects of top Global Pharma and Biotech companies. Gurpreet is a certified Six Sigma and Project Management Professional. He has keen interest in Digital Transformation and Organization Culture and has successfully led various projects during his tenure in the Pharma Industry. He is an avid runner and a speaker at various PV conferences. Punam Kumari is a seasoned PV expert with 10+ years' experience in various areas of PV. She has worked in companies like Tata Consultancy Services and GlaxoSmith-Kline. She is currently pursuing her Masters in Pharmacology and Drug Development and has a keen interest in Patient safety.

Liberata Sportiello[1,2]*, Annamaria Mascolo[1,2], Federica Fraenza[1,2], Annalisa Capuano[1,2]

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[2]Department of Experimental Medicine, University of Campania "Luigi Vanvitelli", Naples, Italy

Maternal, fetal and neonatal outcomes for women exposure during pregnancy to COVID-19 vaccines

Although the European Medicines Agency (EMA) encourage coronavirus disease 2019 (COVID-19) vaccination in pregnant women, the scientific evidence supporting the use of COVID-19 vaccines during pregnancy is still limited. Thus, we investigated Adverse Events Following Immunization (AEFI) with COVID-19 vaccines during pregnancy.

For this aim, we retrieved Individual Case Safety Reports (ICSRs) related to the use of COVID-19 vaccines during pregnancy from the European pharmacovigilance (EudraVigilance) for the year 2021. We analyzed AEFI related to both the mother and fetus/newborn and we computed the Reporting Odds Ratio (ROR) in order to compare the reporting probability of spontaneous abortion between COVID-19 vaccines.

During the study period, among 1,315,315 ICSRs related to COVID-19 vaccines, we retrieved 3,252 (0.25%) reports related to the use in pregnancy. More than half (58.24%) of ICSRs were submitted by non-healthcare professionals. Although the majority (87.82%) of ICSRs concerned serious AEFI, their outcomes were mostly favorable. In this study, 85.0% of total ICSRs referred to pregnant women (n = 2,764), while 7.9% referred to fetuses/newborns (n = 258). We identified 16,569 AEFI. Moreover, 55.16% were AEFI not related to pregnancy (mostly headache, pyrexia, and fatigue), while 17.92% were pregnancy-, newborn-, or fetus-related AEFI. Among pregnancy related AEFI, the most reported was spontaneous abortion. Messenger RNA (mRNA) vaccines had a lower reporting probability of spontaneous abortion than viral vector-based vaccines (ROR 0.80, 95% CI 0.69-0.93). Moderna and Oxford-AstraZeneca vaccines had a higher reporting probability of spontaneous abortion (ROR 1.2, 95% CI 1.05-1.38 and ROR 1.26, 95% CI 1.08-1.47, respectively), while a lower reporting probability was found for Pfizer-BioNTech vaccine compared with all other COVID-19 vaccines (ROR 0.73, 95% CI 0.64-0.84). In addition, 5.8% of ICSRs reported a fatal outcome.

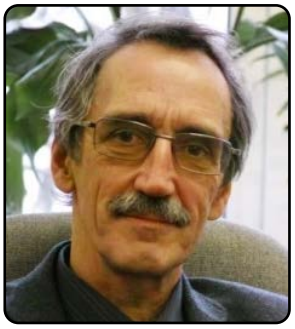
At the light of these results, no strong insight of unknown AEFI associated with COVID-19 vaccination in pregnant women was observed. Considering the high risk associated with Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection, our analysis suggests that the benefits of COVID-19 vaccines during pregnancy outweigh the possible risks. However, it is important to continue monitoring the safety profile of COVID-19 vaccines in this subpopulation.

Audience Take Away Notes

- None of COVID-19 vaccines approved under the conditional marketing authorization was tested in pregnant women during the initial trials
- Observational data from pregnant women vaccinated with COVID-19 vaccines did not show an increase in adverse pregnancy outcomes
- Given the poor attitude of healthcare professionals in encouraging the vaccination during pregnancy, the results of this analysis could make aware them on safety profile of Covid-19 vaccines and reduce the amount of anxiety and concern of the pregnant women to get vaccinated

Biography

Liberata Sportiello graduated in Pharmaceutical Chemistry and Technologies in 2006 and specialized in Hospital Pharmacy in 2009 at the "Federico II" University in Naples (Italy). Successively, she joined the research group of Prof. Annalisa Capuano at the University of Campania "L. Vanvitelli" in Naples, where she obtained a permanent contract for an academic position in 2011 and her PhD degree in Pharmacology in 2013. She gained a long research experience in pharmacovigilance and pharmacoepidemiology, focusing on the analysis of databases related to safety profile of drugs and vaccines. She has published more than 60 articles in peer-reviewed international scientific journals.



Polyakov N E[1]*, Mastova A V[1], Kruppa A I[1], Leshina T V[1], Asfandiarov N L[2], Pshenichnyuk S A[2]

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Synergy of antioxidant and drug delivery abilities of glycyrrhizin

Electron transfer plays a critical role in the generation of Reactive Oxygen Species (ROS) in living systems. Molecular oxygen acts as a terminal electron acceptor in the respiratory chains of aerobic organisms, as well as in some photoinduced processes with subsequent formation of ROS. Two main mechanisms of antioxidant protection by exogenous antioxidants are usually considered. The first is the inhibition of ROS formation, the second is the capture of free radicals. In this work, we investigated the mechanism of the antioxidant activity of glycyrrhizin (the main active component of licorice root) and its aglycone, glycyrrhetic acid.

Glycyrrhizin has long been used in folk medicine in China, Egypt, Japan and other countries for the treatment of a wide range of diseases. Recent studies by Russian scientists have revealed another amazing property of glycyrrhizin, namely the ability to enhance the effect of other medicinal compounds due to the formation of supramolecular complexes. However, among scientists there is still no consensus on the physicochemical mechanisms of the biological activity of glycyrrhizin at the molecular level, and discussions on this topic continue to this day.

In the present work, we tried to systematize the available data on the antioxidant activity of glycyrrhizin, obtained using various physicochemical methods, including Chemicaly Induced Dynamic Nuclear Polarization (CIDNP) and Dissociative Electron Attachment (DEA) techniques, and also to stimulate further research and discussion about the mechanisms of its activity and the prospects for its use as a multifunctional drug delivery system. In particular, the affinity of solvated electrons to the glycyrrhizin and glycyrrhetic acid molecules was demonstrated using the CIDNP and DEA methods. DEA experiments indicate that glycyrrhetic acid is an even better electron acceptor than molecular oxygen, at least under gas phase conditions.

Audience Take Away Notes

- Glycyrrhizin as a new multifunctional drug delivery system – new data will be interesting to wide audience of scientific researchers in the fields of medicinal chemistry, supramolecular chemistry and membrane biophysics, as well as for education purposes
- Synergy of drug delivery with antioxidant activity
- Application of physical methods, CIDNP and DEA, in drug discovery

Biography

Dr. Nikolay E. Polyakov is a head of laboratory of Magnetic phenomena at the Institute of Chemical Kinetics and Combustion of the Russian Academy of Sciences. He received his PhD degree in 1987 at the same institution. After one year postdoctoral fellowship in National Industrial Research Institute of Nagoya (Japan), Dr. Polyakov as a Visiting Professor performed joint projects with University of Alabama and University of Utah (USA) as well as with Zhejiang University of Technology (China). The areas of his interest are drug delivery systems and the role of free radicals in biology and medicine. He is the authors of more than 100 scientific papers in these areas.

Nikola Matejkova[1]*, Lucie Korecka[1], Petr Salek[2], Olga Kockova[2], Ewa Pavlova[2] Zuzana Bilkova[1]

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Preparation of uniform hyaluronic acid nanoparticles for biomedical applications

Hyaluronic Acid (HA) is a naturally occurring long linear polysaccharide known for its biocompatibility, biodegradability, and non-immunogenicity. Nanoparticles from hyaluronic acid have great potential as drug delivery carriers of chemotherapeutics and other biomolecules. The robustness and reproducibility of the preparation method are essential for the final use of Hyaluronic Acid Nanoparticles (HANPs) in biomedical applications. The nanoparticles also must have a defined size and low polydispersity index. Therefore, the whole preparation process needs to be very well optimized.

Here, we present four validated protocols for the preparation of hyaluronic acid nanoparticles by cross-linking of the linear HA polymer, where four different amine-containing compounds were applied: Adipic Acid Dihydrazide (AAD), Bis(3-Aminopropyl)Amine (BAPA), 2,2′-(Ethylenedioxy) Bis(Ethylamine) (EDBE), and Ethylenediamine (EDA). To confirm the reproducibility of the method, the nanoparticles were thoroughly characterized. By these protocols, we were able to prepare nanoparticles of size as follows: HANPs prepared with AAD at around 80 nm, HANPs-BAPA at 120 nm, and HANPs-EDBE and HANPs-EDA at around 110 nm. All with an extremely low polydispersity index (values around 0.3). Additionally, we ensured that hyaluronic acid was not fragmented during the preparation of HANPs. Our experimental data clearly showed that the mere choice of a cross-linking agent significantly affects the size, polydispersity of nanoparticles, and their potential for biomedical use. By Dynamic Light Scattering (DLS) analysis, all nanoparticles were demonstrated as monodisperse and uniform. However, in further characterization, concretely Nanoparticle Tracking Analysis (NTA), HANPs-BAPA, and HANPs-EDA indicated a dichotomy of the samples.

Therefore, our results show the inadequacy of using the dynamic light scattering method as the only method for size assessment. The resulting nanoparticles were characterized by nanoparticle tracking analysis, asymmetric flow field fractionation, transmission electron microscopy, Fourier-transform infrared spectroscopy, and Multi-Parametric Surface Plasmon Resonance (MP-SPR) to ensure complex characterization.

In conclusion, our study offers a tool to produce uniform, fully parametrized, and stable nanoparticles with attested affinity to receptor CD44 for the potential drug delivery for not only chemotherapeutics.

Acknowledgements: Financial support from the Faculty of Chemical Technology, University of Pardubice project no. SGS_2023_005 is gratefully acknowledged.

Audience Take Away Notes

- Importance of nanotechnology in biomedical applications
- Necessity of complex characterization of new nanomaterials
- Usage of biocompatible and biodegradable polymers (polysaccharides) for the development of new drug delivery carriers
- Possibility of delivering cytotoxic therapeutics directly to the tumor tissue

Biography

Nikola Matejkova is a Ph.D. student of a scientific group of Immunology and Molecular Biology under the supervision of Prof. Zuzana Bilkova in the Department of Biological and Biochemical Sciences at the University of Pardubice in the Czech Republic. The theme of her dissertation thesis is “The preparation and functionalization of new nanomaterial carriers for drug delivery systems.” She obtained her master’s degree in Nanotechnology at the University of Palacky in the Czech Republic. From her bachelor studies, her research’s focus was in bionanotechnology and the applications of nanotechnology in medicine.

Ashtavaidyan E T Krishnan Mooss

Executive Director, Vaidyaratnam Group, Ollur Thaikkattussery, Thrissur, Kerala, India

Intellection of molecular drug delivery models -an ayurvedic perspective

Ayurveda is a traditional healthcare system of Indian medicine since ancient times. The several drugs have been developed and practiced from Ayurveda since ancient time to modern practice as 'tradition to trend'. Charaka Samhita, Sushruta Samhita (~400 BC–200 AD) and Ashtanga Hridaya of Vagbhata are main classics, which give detailed descriptions of over 700 herbs and 6,000 formulations. Madhav Nidan (~800 AD), a diagnostic classic, provides over 5,000 signs and symptoms of different systemic error that may leads to mis function of bio genomics in later. Life in Ayurveda is conceived as the union of the body, senses, mind, spirit and also involves classification of human on the basis of their phenotype expression. Personalized medicine is the most significant outcome of modern genomic science and it has to come to develop more in the coming years. But philanthropist of Ayurveda had explained the importance of human phenotype expression (prakriti) in maintaining health and managing the disease in a personalized manner since long years back. One of the important benefit of personalized medicine is avoiding "one size fits all" to reduce side effects differentiated with different persons.

Classifying humans based on phenotype still remains a challenge to biomedical science. A number of research groups are now investigating the correlation between Ayurvedic phenotype and individual human genotype. A pioneering study showed significant correlation between HLA alleles and Ayurvedic phenotype (Prakriti) type (1). The biological and ethnopharmacological importance of Ayurvedic drugs are being studied with immense interest about its different chemical compounds with different type of biomechanics in human bio environment. (2)

The system of traditional Indian medicine have the wisdom of different medicinal plants to extract its biologically active phytochemicals and formulate in various dosage forms. The intellect of permutation and combination of molecules from differential herbs to nanoparticles, (Sookshma churna) liposome, (Ghee/oil based medicaments) nanoemulsion, (Avartana) ethosome,(snana churna) microsphere,(Prasa) phytosomes,(milk based kashaya) solid lipid nanoparticles (Ghrita) have contributed significantly to the enhancement of therapeutic potential and still in practise. The permutation and combination (heterogeneous phase) of extracts in the formulations have demonstrated remarkable improvement in the stability, sustained release, improved therapeutic efficacy, reduced toxicity and side effects. Thus, all the above delivery system theories are related with current scientific knowledge referring to haemodynamics, mode of nourishment, Electrolyte homeostasis, cell integrity balance, cross membrane transport, Targeted mode of activities, nutrient supply and replenishment of tissues at different levels of metabolism needs global attention for potential research for the wellness of world mankind.

It was written in 950 BC by Indian philanthropist pointing 'Loka samastha sukino Bhavanthu' means the concept of wellness of globe which is very remarkable in the present era.

Biography

Dr. E.T. Krishnan Mooss, BAMS, MD (Kayachikitsa), s/o E.T. Neelakandhan Mooss, aged 29 years, was born at Eledath Thaikkattu Mana, Thaikkattussery P.O., Ollur, Thrissur, Kerala. He did BAMS (Bachelor in Ayurveda Medicine and Sur-

gery) from Vaidyaratnam Ayurveda College, Ollur, Thrissur, and later successfully completed M.D. (Kayachikitsa-Internal medicine) from SDM Ayurveda Medical College, Udupi, Karnataka. He did his thesis on the effectiveness of Avarthaki Choorna in Type-2 Diabetes Mellitus – An open-label clinical study. He had authored/co-authored the Articles / Clinical Studies on: Prevalence of Pre-diabetes / Type 2 diabetes among adolescents (10-19 years) and its association with different measures of overweight / obesity in India: A Gendered perspective. Clinical study on the effectiveness of Jala Nasya in Allergic Rhinitis.

Asit Kumar Chakraborty

Department of Biotechnology and Biochemistry, Oriental Institute of Science & Technology-West Bengal, Vidyasagar University, India

Biotechnological exploration of phyto-drugs against mdr bacteria targeting DNA topoisomerase I and RNA polymerase

Alpha and Delta corona viruses spread worldwide claiming >634000 lives and secondary multidrug resistant infections were found a risk factor specifically in ICU patients containing carbapenem-resistant Acinetobacter baumannii, Pseudomonas aeruginosa, Enterococcus faecium and Klebsilla pneumoniae. MDR large (100-500kb) plasmids have acquired.>10 mdr genes (bla, aac, aph, aad, sul) and drug efflux genes (Tet, Acr, Mex) to inactivate antibiotics and development of new antibacterial drugs are urgently needed. Plants secret anti-metabolites to retard growth of soil and water bacteria and are ideal source of antibiotics. Six plants derived bacteriocidal organic extracts were selected testing 80 medicinal plants against MDR bacteria. The Cassia fistula bark saponin poly-bromo-phenol compound (CU1) inhibited RNA polymerase from Escherichia coli as well as Mycobacterium tuberculosis as compared to refampicin. Gel shift assays demonstrated that CU1 interferes at the open promoter complex formation step. Further, cultivated Suregada multiflora root extracts was found exceptionally active (18 fold than natural sources) against MDR bacteria. We purified the active principle NU2 by TLC and HPLC, and also confirmed by MASS, NMR and FT-IR. NU2 is a glycoside and inhibits unicellular parasites like Leishmania donovani, Trypanosoma brucei and Plasmodium falciparum. NU2 actively inhibited the DNA topoisomerase I and RNA polymerase to lesser extent of Escherichia coli suggesting the modes of action. Scientists postulated that MDR infections might claim 10 million deaths as we would approach 2050. MDR void will increase due to few reasons: (1) mdr genes are accumulated in large conjugative plasmids with transposons and integrons; (2) the spread of mdr genes in Ganga river water bacteria is increasing at ~5%/year and (3) mdr genes creation facilitates to protect gut microbiota from repeated oral antibiotics use. Thus, phyto-drug may be a solution to curve secondary MDR bacterial infections in coronavirus infected patients.

Audience Take Away Notes

- Phyto-drug research has prioritized by many Government
- Knowing the mechanism of inactivation of antibiotics by mdr enzymes
- Some aspect of phyto-drug purification problems and chemical structure determination will be explained
- To find job today, you need to know in details biochemistry and pharmacology
- Leaders of poor countries should think for million poor families as drug price sky rocketing

Biography

Dr. Asit Kumar Chakraborty was performed his PhD at CSIR-Indian Institute of Chemical Biology, Kolkata and awarded PhD degree in 1990 from Calcutta University. He did postdoctoral work at University of California at Berkeley and visiting scientist at Johns Hopkins University School of Medicine. He was Associate Professor of Biochemistry at OIST, Department of Biotechnology, Vidyasagar University and now retired.

Eman R Abbase[1]*, Medhat Shafaa[1], Tomohiro Hayashi[2]

[1]Department of Physics, Faculty of Science, Helwan University, 11731, Cairo, Egypt
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Investigating the effect of liposomal membrane rigidity on the permeability of doxorubicin

The permeability of the liposomal membrane is an important factor in determining whether drugs encapsulated inside liposomes are released. Many studies revealed the role of thermotrophic phase, saturation degree and acyl chain length for the permeability of liposomal membrane. But the effect of the rigidity of the membrane on the permeability has not been well studied.

In the present study, the rigidity of lipid vesicles synthesized from DPPC, DPPC/Cholesterol(CHOL), DPPC/CHOL/Stearylamine (SA), DPPC/CHOL/ Dicetylphosphate (DCP), and DPPC/CHOL/SA/PEG-PE was estimated by using Atomic Force Microscope (AFM) based spectroscopy, and correlated with the permeability of liposomal membrane for doxorubicin as a drug model.

The results show that an inverse correlation between the membrane rigidity of lipid- based nano-sized liposomes and the permeability was found.

Audience Take Away Notes

- Our research focused on a novel parameter that effects on drug release from liposome
- Yes, this research needs to expand to create a library of mechanical parameters (Bending Modulus, Youngs Modulus) for a set of phospholipids that used in the liposomal formulation
- Optimizing the mechanical properties of liposomes assist to improve the drug design
- Machine learning must support with experimental work to predict more possibilities

Biography

Dr. Eman studied biophysics at Helwan university, Cairo, Egypt and awarded MS degree in Medical biophysics in 2012 at the same university, her master entitled (Biophysical Studies of Antitumor Drug Encapsulated Phosphatidylcholine Liposomes). She joined as a visiting researcher at the research group of Prof. Hayashi at Tokyo Institute of Technology, Department of Materials Science and Engineering, School of Materials and Chemical Technology. She received PhD degree in 2022 at Helwan university. Her work aims to deep understanding the interaction between liposomes as drug delivery system and the biological system to improve the drug delivery design to be more effective.

Ali Yetgin

Toros Agri Industry, Research and Development Center, Mersin, Turkey
Cukurova University, Institute of Nature and Applied Sciences, Department of Biotechnology, Adana, Turkey

The role of plants in modern drug discovery and screening

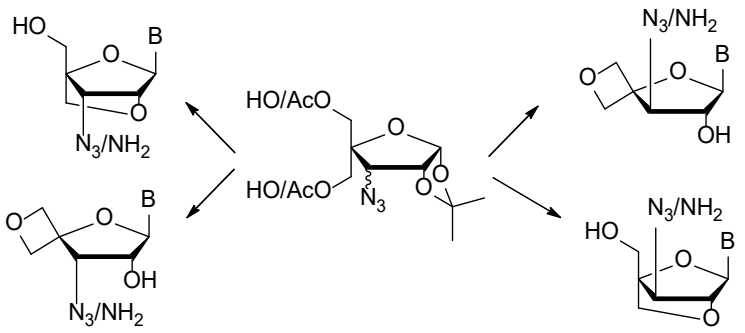
Plants have played a pivotal role in the realm of contemporary drug discovery and screening, serving as a vast source of diverse and bioactive compounds. The present study thoroughly examines the multifarious contributions of plants to the progression of pharmaceutical research and development. Commencing with a historical outlook on the utilization of plant-derived remedies, we chart the evolution of plant-based drug discovery from traditional herbal medicine to sophisticated screening techniques. The innate complexity of plant secondary metabolites has incited scientific interest in their potential therapeutic applications. Through systematic screening endeavors, numerous bioactive compounds possessing medicinal properties have been identified, paving the way for the creation of innovative pharmaceuticals. Additionally, the symbiosis between traditional knowledge and contemporary scientific methods has facilitated the discovery of previously unexplored reservoirs of bioactive compounds. In this investigation, we scrutinize the diverse approaches employed in the screening of plant extracts and isolated compounds, spanning from high-throughput assays to virtual screening methods. We emphasize the significance of biodiversity conservation in conserving access to valuable plant resources for future drug discovery undertakings. The intricate interplay between ethnobotanical sagacity, phytochemistry, and advanced screening methodologies underscores the critical role that plants continue to play in addressing unfulfilled medical needs. As the pharmaceutical industry endeavors to seek sustainable and innovative solutions, harnessing the potential of plants offers a promising pathway for discovering novel therapeutic agents. Through a comprehensive evaluation of the current state of plant-based drug discovery and screening, this review underscores the enduring significance of plants in shaping the future of medicine.

Rajesh Kumar
Department of Chemistry, R.D.S. College (B.R.A. Bihar University),
Muzaffarpur-842002, India

Chemo-enzymatic approach to synthesis of modified nucleosides

Over two decades, a large number of nucleosides have been synthesized, which demonstrated potent antiviral and antitumour activities and have become cornerstones of treatment for patients with cancer or viral infections. Oligonucleotide-based antisense strategies represent a unique paradigm for the treatment of a wide variety of human diseases. In order to discover new class of nucleoside derivatives with enhanced biological activities, the modifications in the sugar moietiy have been attempted, which provide a remarkable level of control over nucleoside sugar puckering and its biological activity.

Herein, we report; (a) the selective biocatalytic acetylation studies on modified 3′-azido-4′-C-hydroxymethylated sugar derivatives with an aim to develop an efficient and easy method for the synthesis of ribo-azido/amino LNA monomers and xylo-azido/amino spiro-oxetano nucleosides and (b) the selective biocatalytic deacetylation studies on modified 3′-azido-4′-C-acetoxymethylated sugar derivatives with an aim to develop an efficient and easy method for the synthesis of ribo-azido/amino spiro-oxetano nucleosides and xylo-azido/amino LNA monomers.



B = Nucleo Bases (T, U, C & A)

Audience Take Away Notes

- During presentation I will explain the use of lipases in academic and industry, apart from this I will also explain novel and greener methodology for the synthesis of modified nucleosides. As I know that nucleosides are valuable component of nucleic acid and it shows different types of activities such as antiviral, anticancer etc

Biography

Dr. Rajesh Kumar received his Master of Science degree in organic chemistry from University of Delhi in 2010. He joined the same department for a PhD and completed his Ph.D in 2017 and during Ph.D, Dr. Kumar visited University of Southern Denmark as a Research Assistant for nine months. After completion of Ph.D, he joined as Assistant Professor in chemistry at B.R.A. Bihar University, India. He has published 25 research papers in reputed national and international journals such as The Journal of Organic Chemistry, Theranostics, Carbohydrate Research, RSC Advances etc. His research interest lies in Nucleic acid chemistry, Biotransformations, Catalysis, Green Chemistry, and heterocyclic chemistry.

Kalirajan Rajagopal*, Kannan R

Department of Pharmaceutical Chemistry, JSS College of Pharmacy, JSS Academy of Higher Education & research, Ooty-643001, The Nilgiris, Tamilnadu, India

Design, synthesis of some novel chromen derivatives and evaluation of their effectiveness as the inhibitors of SARS-Cov-2 virus 3CL protease enzyme

Since 2020, COVID-19 has created a major threat to human population across the globe. There are many mutations in SARS CoV-2 like Alpha, Beta, Delta and Omicron etc. A newly emerged SARS-CoV-2 variant B.1.1.529 has worried the health policy makers worldwide due to the presence of a large number of mutations in its genomic sequence, especially in the Mpro (Omicron) protein region. But still, we are not known about the effectiveness of vaccines and drugs against all the variants. In continuation of our research in SARS CoV-2, from the hits obtained from natural compounds by in-silico drug design, we have designed some novel Chromen derivatives by molecular hybridization approach. The final designed molecules were subjected to molecular docking studies by Glide module, MMGBSA binding free energy calculations by prime module and MD simulation studies by Desmond module of Schrodinger suit-2021-4. The in-silico ADMET properties were predicted by using Qikprop tool which showed the favorable pharmacokinetic profile of the compounds. Then the compounds were synthesized, characterized by spectral studies. Finally In-vitro assay was carried out for all the derivatives and screened for their anti-SARS CoV-2 activity employing the 3CL Protease or Main Protease (Mpro) (B.1.1.529, Omicron Variant, P132H mutant) (SARS-CoV-2) assay Kit. The IC50 value of the test compound was found between 45.28 µM and 203.5 µM. the standard inhibitory concentration of GC376 was 38.64 µM.

Audience Take Away Notes

- This research work explains in-silico design against SARS CoV-2 Omicron target
- This research that other faculty could use to expand their research or academic
- This research work explains the docking, ADMET, molecular dynamics study of the hits
- This research also explains about the synthesis, characterization and in-vitro screening against SARS CoV-2 CLpro target
- This research work will be helpful to design novel molecules against COVID-19

Biography

Dr. Kalirajan Rajagopal graduated both UG and PG in Pharmaceutical Chemistry at The Tamilnadu Dr. MGR medical University, Chennai. He received his PhD degree in 2013 at JSS University, India. He has 24 years of teaching and research experience and currently working as Professor and Head in department of Pharmaceutical Chemistry, JSS Academy of Higher Education & Research, India since July, 2006. He has nominated as BOS member in various universities. He Published 103 research papers with IF range 0.1 to 7.2 and H-index 16 by Scopus and 21 by Google scholar and 9 books. Received many awards.

Wayne Kaesemeyer

President, Augusta Hypertension PC, 108 Tharrington Drive Chapel Hill, North Carolina 27516-4419, United States of America

Novel glutathione based formulations for targeting the NLRP3 inflammasome in the treatment of cardiovascular diseases

This presentation will focus on the NLRP3 inflammasome and its involvement in the pathogenesis of cardiovascular diseases, the causes of its activation and approaches to targeting these causes based on an extrapolation of the mechanism for preventing nitroglycerin tolerance using glutathione. The presentation will describe three novel formulations proposed for preventing activation of the NLRP3 inflammasome. The three formulations are:1] glutathione + nitroglycerin buffered with arginine;2] formulation 1 + dapagliflozin and 3] formulation 2 minus nitroglycerin. This will be followed by a list of diseases matched to treatment with these formulations. The list of diseases and treatments to be discussed includes advanced heart failure, restenosis, claudication, acute kidney injury, refractory angina and coronary microvascular disease, anthracycline cardiotoxicity, hypertensive disease of pregnancy/ preeclampsia, postpartum cardiomyopathy and COVID-19. The presentation will conclude with a plan for FDA CMC studies with these formulations and their suitability for use in newer parental delivery systems.

Audience Take Away Notes

- The role of the NLRP3 inflammasome in the pathogenesis of cardiovascular disease
- The role of glutathione in nitroglycerin tolerance and its basis for three new formulations for preventing the activation of the NLRP3 inflammasome
- Cardiovascular diseases likely to benefit from the proposed three new formulations

Biography

W H Kaesemeyer, MD is an independent research cardiologist whose current focus is preventing the activation of the NLRP3 inflammasome in the treatment of cardiovascular diseases, all as an extrapolation of his work on the cause and prevention of nitroglycerin tolerance. He has practiced for 28 years as a hypertension specialist who is board certified in internal medicine. This followed 4 years of medical school (MD 1978 Wake Forest University, Winston-Salem, NC) and 4 years of residency training that included a year as a chief resident, all of which followed initially working as a pharmaceutical chemist. He has been principal investigator on 20 clinical trials of hypertension, lipids and heart failure medications. He is an author or co-author on over 35 publications and inventor on 5 patents involving nitric oxide, nitroglycerin tolerance and statin nitric oxide pleiotropy.

Andrea Stierle[1]*, Donald Stierle[1], Nigel Priestley[2], Jeremey Alverson[2]

[1]Department of Biomedical and Pharmaceutical Sciences, University of Montana, Missoula, Montana, United States of America

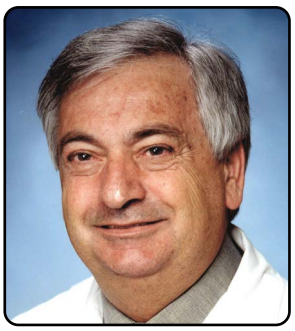
[2]Department of Chemistry and Biochemistry, University of Montana, Missoula, Montana, United States of America

Further studies on a new family of antibiotics produced by cryptic biosynthesis in extremophilic fungi

According to the CDC, at least two million people are infected with antibiotic-resistant bacteria every year, and over 35,000 die annually as a direct result of these infections. The Infectious Disease Society of America published a policy report that outlined the consequences of the alarming rates of antibiotic resistance and the dire need for reinvestment in the search for new antibiotics to overcome the lean development pipeline. In 2017 the Stierle research lab reported a new class of fungal macrolide antibiotics produced in co- culture by two extremophilic fungi. These fungi were isolated from the Berkeley Pit, an acid mine waste lake in Butte, Montana, USA. Unlike canonical bacterial macrolide antibiotics, the berkeleylactones lack the sugar moieties responsible for both the activity and induced resistance associated with other classes of macrolide antibiotics. The berkeleylactones also have a unique mode of action. The lead compound, Berkeleylactone A, targets multi-drug resistant strains of Staphylococcus aureus and Bacillus anthracis with MIC values near 1 μg/mL. The berkeleylactones are undetectable in axenic cultures of the contributing fungi, which suggests that co-culture can elicit cryptic biosynthesis in participating organisms. Efforts to determine the mode and mechanism of action of the berkeleylactones, to develop more potent analogues of this new class of antibiotics, and to assess their in vivo efficacy will be discussed.

Biography

Dr. Andrea received her PhD in Organic Chemistry from Montana State University in 1988. She and her husband Don search for fungi growing in unusual environments as a source of new drug-like molecules that target diseases like cancer or stubborn bacterial infections. They have studied microbes from sponges living in the pristine waters of Bermuda and from yew trees from the temperate rain forests of the Pacific Northwest. In 1995, they began to explore the acidic, metal contaminated waters of the Berkeley Pit, a mine-waste lake in Butte, Montana. They discovered a rich microbiome and have mined these microbes for compounds with promising drug-like properties. They have found compounds that can block the metastatic spread of cancer cells, inflammation, and most recently, a new antibiotic that targets multi-drug resistant Staphylococcus aureus.



Andreas M Papas

Adjunct Professor of the College of Medicine, East Tennessee State University
CEO, Antares Health Products Inc

Emerging formulation and delivery applications of vitamin E TPGS

Vitamin E TPGS (d-α-tocopheryl polyethylene glycol 1000 succinate) combines the functions of solubilizer, emulsifier, and absorption enhancer of lipophilic and poorly soluble drugs. In addition, it enhances drug bioavailability and efficacy through inhibition of the P-glycoprotein mediated drug efflux and other mechanisms which reduce first-pass metabolism and facilitate its transport, cell uptake and function. The safety and efficacy of TPGS expanded research and development in major areas. The presentation will review emerging applications of vitamin E TPGS which include:

- Multi-drug resistance and first-pass metabolism and their effect on drug efficacy, especially in cancer chemotherapy.
- Formation of prodrugs and drug conjugates and their role on drug efficacy and adverse effects.
- Synthesis of TPGS based polymers and their role in drug encapsulation, intracellular uptake, therapeutic effects, and safety.
- Excipient in nanomedicine and targeted drug delivery systems for increased therapeutic effect and reduced toxicity.
- Interactions with active pharmaceutical ingredients through antioxidant function and other mechanisms.
- Function as active pharmaceutical ingredient by selective induction of apoptosis of some cancer cells lines.
- Parenteral administration, a major component of the emerging applications of drug formulation including mRNA, peptide, and other novel drug categories.

Biography

Dr. Papas is Adjunct Professor of the College of Medicine, East Tennessee State University and CEO and member of the Board of Directors of Antares Health Products, Inc. A Fulbright Scholar, Dr. Papas is a graduate of the University of Illinois and author of The Vitamin E Factor paperback and editor of the scientific book Antioxidant Status, Diet, Nutrition and Health. Dr. Papas also founded YASOO Health and led the company as President and Chair of the Board of Directors. He developed product concepts and managed successful commercialization including formulation, clinical evaluation supported by the National Institutes of Health and the Cystic Fibrosis Foundation, stability and safety testing, pilot and commercial production.

F J Meyer Almes[1]*, C S Ramaa[2]

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HDAC inhibitors with non-hydroxamate warhead

Compounds with a Thiazolidinedione (TZD) functionality, so called glitazones, are known as PPARγ-activators and anti-diabetic drugs. The mode of action of these glitazones has extensively be investigated and is known in great structural details. PPARγ is a prominent target with a key role in the regulation of glucose homeostasis and lipid metabolism. However, PPARγ is also vital to cancer cell growth regulation. Moreover, a combination treatment with Histone Deacetylase (HDAC) inhibitors and PPARγ agonists increased cytotoxic effects against various cancer cell lines in a synergistic manner resulting in proliferation arrest and apoptosis. A closer view at the TZD group led us to conclude that TZD compounds should be in principle capable of binding to the catalytic zinc ion at the bottom of the active site of zinc-dependent members of the HDAC protein family. This hypothesis has been confirmed by molecular docking. Therefore, we investigated the inhibitory effect of 225 TZD-analogs on HDAC4 and HDAC8. Different clusters with dual acitivity against PPARγ and HDAC4, or VEGFR-2 and HDAC4 were identified and mechanistically analyzed. Most potent compounds exhibit pronounced antiproliferative effects against tumor cells, and are also able to induce in-vivo tumor regression in animal xenograft tumor models.

Audience Take Away Notes

- TZD-compounds have versatile pharmacological effects
- Terminal TZD-groups can serve as zinc-binding warhead of novel HDAC inhibitors
- Distinct clusters of TZD compounds have dual activity against tumor targets

Biography

Franz-Josef Meyer-Almes is Professor of Biochemistry at the University of Applied Sciences Darmstadt in Germany. He earned his Diploma in Chemistry at the Georg-August-University of Göttingen (Germany) in 1991 and his PhD in Biophysical Chemistry from the same University in Göttingen. The main focus of his research is in thermodynamics and kinetics of protein-ligand and protein-protein interaction, reaction kinetics and mechanism, biological assay development, drug design, medium throughput screening, fluorescence spectroscopy and design of experiment. These methods are used to develop novel active substances against human histone deacetylases, which are validated targets in oncology, but also other neurodegenerative and age related diseases.

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14-15 SEPT

DAY 01

POSTERS

10TH EDITION OF
GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

Danuta Drozdowska[1]*, Artur Ratkiewicz[2], Dawid Maliszewski[1] Agnieszka Wrobel[1]

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The new benzamide derivatives as potential dementia drugs - synthesis, biological activity and molecular docking study

Designing, synthesize and developing of novel bioactive molecules is the crucial role of medicinal chemistry. The concept of drug design and development, called Multi-Target Directed Ligand (MTDL), Multiple Ligand Strategy (MLS) or Designed Multiple Ligands (DMLs), is an innovative approach in the search for drugs, especially for diseases with no effective therapy. Alzheimer's Disease (AD) is a neurodegenerative disease, characterized by progressive loss of memory which is associated with other cognitive deficits. Such a disorder is a neurodegenerative disease characterised by progressive memory loss and other cognitive deficits, namely Alzheimer's Disease (AD). Among the many different AD treatments, cholinesterases still remain key biological targets in AD therapy. The second most common therapeutic target is to affect β-amyloid aggregation by inhibiting β-secretase (BACE1), which initiates its production. Aggregation is believed to be one of the main causes of Alzheimer's disease and therefore its inhibition may modify the course of the disease. Our paper presents the synthesis of multifunctional ligands, their inhibitory activity against both cholinesterase and secretase and molecular docking study.

Using classical procedures, we obtained eleven benzamide molecules and all of them showed significant AChE and BACE1 inhibition. Ellman's colorimetric method was used to determine the AChE inhibitory activity and fluorescence resonance energy transfer (FRET) method to carry out the BACE1 inhibitory activity studies.

The most active against both AChE was N,N'-(1,4-phenylene) bis(3-methoxybenzamide) with an inhibitory concentration of AChE IC50 = 0.056 μM, while the IC50 for donepezil was 0.046 μM. This compound was the most active also against BACE1 enzyme. The IC50 value for it was 9.01 μM compared to quercetine with IC50 = 4.89 μM. The molecular docking studies elucidate how and where ligands interact with enzymes and allow the design of compounds with the most optimal structure for subsequent research.

Audience Take Away Notes

- The audience will be able to broaden their knowledge of the structure-activity relationships and mechanisms of action of new active compounds
- This research may inspire other researchers to extend their research into new directions, e.g. synthetic chemists to broadly investigate the activity of new substances
- The results presented enrich knowledge of pharmacotherapy options in Alzheimer's disease

Biography

Dr. Drozdowska studied Chemistry at the Warsaw University, Poland and graduated as MS in 1989. She then joined the research group of Organic Chemistry, Medical University of Bialystok, Poland. She received her PhD degree in 1999 at the Medical University of Lublin, Poland and habilitation in 2012 at Medical University of Lodz, Poland. After that she obtained the position of an Associate Professor at the Department of Organic Chemistry at Medical University of Bialystok, Poland. She has published about 50 research articles in SCI(E) journals and promoted four doctors of pharmaceutical sciences as well as close to thirty master's theses.

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14-15 SEPT

DAY 02

KEYNOTE FOURM

10TH EDITION OF
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PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

Chameleon nanocarriers for dynamic delivery of RNA medicines

Twenty two RNA therapies reached the medical market by Q1 2023. Targeted intracellular delivery remains the key requirement. For refinements of nanocarriers we focus on a bioinspired, sequence-defined process including (i) artificial amino acids (ii) precise assembly into xenopeptide sequences by solid phase-assisted synthesis (iii) screening for delivery and selection of top candidates. A recent chemical evolution library combined aminoethylene amino acids as polar protonatable units with novel Lipo Amino Fatty Acids (LAFs) as hydrophobic protonatable motifs. These novel double pH-responsive nucleic acid carriers utilize intracellular delivery mechanisms of both cationizable lipids and cationic polymers. The endosomal pH-dependent tunable polarity of LAF was successfully implemented by a central tertiary amine, which disrupts the hydrophobic character once protonated, resulting in drastic pH-dependent change in the logarithmic (octanol/water) distribution logD from around +1 (pH 7.4) to -1 (pH 5.5). This "molecular chameleon character" turned out to be advantageous for mRNA, siRNA or CRISPER/Cas9 sgRNA delivery. The efficiency of best performers was up to several 100-fold higher compared to previous carriers. Transfection activity of mRNA lipoplexes was maintained even in the presence of 90% serum and at extremely low dosage of 3 pg mRNA (~2 nanoparticles/cell), in the range of the viral potency. mRNA lipoplexes showed great in vivo performance in mice with high expression levels in spleen, tumor, lung, and liver upon intravenous administration of 1 µg luciferase mRNA.

Audience Take Away Notes

- Explains how bioinspired chemical evolution can be applied to optimize RNA carriers
- Chemical evolution is based on precise sequences of defined building blocks
- Sequence-defined xenopeptides are assembled by solid-phase synthesis using artificial amino acids
- Intracellular delivery transporters must be dynamic to be efficient on nanoparticle basis

Ernst Wagner

Pharmaceutical Biotechnology, Department of Pharmacy, Center for NanoSciences (CeNS), Ludwig-Maximilians-Universität Munich, Germany

Center for NanoSciences (CeNS), Ludwig-Maximilians-Universitat Munich, Germany

Biography

Ernst Wagner is professor of Pharmaceutical Biotechnology and Center of NanoScience at LMU Munich since 2001. From 1992-2001 he was Director Cancer Vaccines, Boehringer Ingelheim (first polymer-based gene therapy trial in 1994), 1987-1995 Group Leader at IMP Vienna and Vienna University Biocenter, 1985-1987 postdoc at ETH Zurich, in 1985 PhD in chemistry (TU Vienna). He is Academician of European Academy of Sciences, member of CRS College of Fellows, Board member of German Society for Gene Therapy. He has authored 500 publications, with 50 503 citations, h-index 112 (GS).

Qualitative and quantitative measures of drugs' placenta permeability - A chromatographic and computational approach

Novel Quantitative Structure-Activity Relationship (QSAR) models of compounds' Placenta (PL) permeability expressed as their: i) log FM (fetus-to-mother blood concentration) values; ii) Clearance Index (CI); iii) binary PL1/0 (crossing/non-crossing; Yes/No) score were generated based on chromatographic and computational descriptors. Chromatographic data were collected using Micellar Liquid Chromatography; computational descriptors were calculated using SwissADME and Mordred software available freely on-line. Suitable computational descriptors were selected using Partial Least Square (PLS) technique. Predictive models of compounds' log FM and CI were generated using a number of statistical tools: Multiple Linear Regression, Boosted Trees, and Artificial Neural Networks. Binary (qualitative) models of compounds' placenta permeability (Yes/No) were generated using Discriminant Function Analysis and Principal Component Analysis. All models were validated using a test set of compounds that were not used for model building. Compounds of interest include drugs and environmental pollutants, e.g. pesticides.

Audience Take Away Notes

- The ability of compounds to cross the placenta may be predicted using chromatographic and computational data
- No human or animal experiments are needed
- Proposed models are applicable to drugs and environmental contaminants (e.g. pesticides) alike

Anna W Sobanska

Department of Analytical Chemistry, Faculty of Pharmacy, Medical University of Lodz, Poland

Biography

Dr. Anna W. Sobanska studied Chemistry at the Technical University of Lodz, Poland and graduated as MSc in 1992. She then joined the research group of Prof. Jeremy Robertson at Dyson Perrins Laboratory, Oxford University, UK. She received her PhD degree in Organic Chemistry in 2007 at the same institution. She obtained the position of a Formulation Chemist in Cosmetic Factory Pollena-Ewa in Lodz, Poland. In 2005 she joined the Department of Analytical Chemistry, Medical University of Lodz, Poland. She has published several research articles in SCI(E) journals.

Human nanomedicine: Emphasizing results of nanomaterials in humans

Nanomaterials have been widely tested in vitro and in small order animal studies for decades. Results have shown greater tissue growth, decreased bacteria growth, and inhibited inflammation. However, few studies exist examining human tissue response to nanomaterials. This presentation presents a cohort study of nano implants inserted into humans. In particular, one study includes the implantation of nanotextured spinal implants into over 14,000 patients over the past 5 years. Results demonstrated no cases of infections or other implant failures which is significantly better than statistics on conventional spinal implants which have up to 20% failure rates. This study will further explain that nano implants mimic the natural nano texture of bone itself and possess surface energy that can competitively increase the adsorption of proteins known to promote osteoblast (bone forming cells) functions, decrease bacteria functions, and limit inflammatory cell functions. As such, this presentation will cover the few human clinical studies on nano implants showing improved human health.

Audience Take Away Notes

- How nanomaterials are improving health in humans
- Specific human clinical data with nanomaterials
- What is the mechanism by which nanomaterials improve tissue growth, limit infection, and reduce inflammation

Thomas J Webster

School of Health Sciences and Biomedical Engineering, Hebei University of Technology, Tianjin, China

Biography

Thomas J. Webster's (H index: 115; Google Scholar) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995; USA) and in biomedical engineering from RPI (Ph.D., 2000; USA). He has served as a professor at Purdue (2000-2005), Brown (2005-2012), and Northeastern (2012-2021; serving as Chemical Engineering Department Chair from 2012 - 2019) Universities and has formed over a dozen companies who have numerous FDA approved medical products currently improving human health. He is currently helping those companies and serves as a professor at Hebei University of Technology, Saveetha University, Vellore Institute of Technology, UFPI, and others. Dr. Webster has numerous awards including: 2020, World Top 2% Scientist by Citations (PLOS); 2020, SCOPUS Highly Cited Research (Top 1% Materials Science and Mixed Fields); 2021, Clarivate Top 0.1% Most Influential Researchers (Pharmacology and Toxicology); 2022, Best Materials Science Scientist by Citations (Research.com); and is a fellow of over 8 societies. Prof. Webster is a former President of the U.S. Society For Biomaterials and has over 1,350 publications to his credit with over 53,000 citations. He was recently nominated for the Noble Prize in Chemistry (2023).

New approaches to inhibit miRNAs in an atherosclerosis pre-clinical model

It is known that several microRNAs (miRNAs) have an important regulatory role during the different stages of the atheroma plaque formation. In preclinical studies, the regulation of its expression has been shown beneficial outputs in the treatment of atherosclerosis. Thus, the therapeutic targeting of miRNAs represents an attractive approach for the treatment of atherosclerosis in preclinical and clinical studies. Different approaches have been undertaken to decipher the potential of miRNA therapeutics. To repress pathological miRNAs or over-express protective miRNAs, miRNA inhibitors or miRNA mimics, respectively, have been employed. Despite significant achievements in the field, cellular uptake, the potential need for multiple doses to achieve the desired effect, biodistribution, the ability to target a specific tissue or cell, the unpredictable and unwanted side effects and toxicity still remain the major limitations for miRNA-targeting therapies. All of these challenges have emphasized the need to develop more efficient delivery systems for miRNA therapeutics in the context of atherosclerosis. Thanks to the development of nanotechnology in the molecular biology field, novel delivery miRNA-base therapies have emerged. The use of an innovative therapeutic approach for targeting miRNAs in vivo using a pH Low-Insertion Peptide it might be of interest. Moreover, the incorporation of miRNA into rHDL with therapeutic purposes is promising. Thus, a miR-rHDL could be an innovative technique and a powerful vehicle tool for searching overexpression or inhibition of key miRNAs in atherosclerotic plaques.

Audience Take Away Notes

- The audience will learn the novelties in the field of miRNAs-base therapies in atherosclerosis

Noemi Rotllan Vilaab

Institut d'Investigacio Biomedica Sant Pau (IIB SANT PAU), Barcelona, Spain

CIBER de Diabetes y Enfermedades Metabolicas Asociadas (CIBERDEM), Barcelona, Spain

Biography

Noemi Rotllan earned her Ph.D. degree in 2003 from Barcelona University. She did postdoctoral trainee at New York University and Yale University, where she was an Associate Research Scientist. In 2019, she got the prestigious Ramon y Cajal fellowship and she moved back to Barcelona in order to start her own laboratory. Her research interests are focused mainly on the role of new microRNAs in hiperhomocysteinemia related atherosclerosis and to use an innovative therapeutic approach for targeting miRNAs in vivo using pHLIP or rHDL. She has published more than 80 research articles in SCI(E) journals.

Pharmacological properties of bexagliflozin, a novel sodium-glucose cotransporter-2 (SGLT2) inhibitor

Diabetes mellitus represents a large-scale health concern and has become a distressing hazard in the modern epoch of compromised lifestyles. So, there is an imperative need for screening and developing new pharmacologically active compounds that can meet still existing insufficiency of the present antidiabetic agents. Sodium-Glucose Cotransporter-2 (SGLT2) inhibitors are relatively novel glucose-lowering drugs that additionally promote weight loss and the reduction of blood pressure. Moreover, the data from pioneering trials consistently demonstrated that the beneficial effects of SGLT2 inhibitors extended to non-diabetic patients with chronic kidney disease and/or heart failure with reduced ejection fraction. This is not a surprise since the kidney plays a vital role in assuring glucose homeostasis, gluconeogenesis, and the reabsorption of filtered glucose in the proximal tubules. Accordingly, the SGLT2 present in the proximal tubule is actually responsible for glucose reabsorption. Bexagliflozin is a recently registered and novel SGLT2 inhibitor indicated as an adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus. Unfortunately, it is not recommended in patients with type 1 diabetes mellitus since it may increase the risk of diabetic ketoacidosis. Given the previous facts, the main objectives of this presentation will be to clarify the pharmacological properties of bexagliflozin, including pharmacodynamics, pharmacokinetics, indications, and contraindications for use, adverse drug reactions, as well as the most important drug interactions. This will provide a better understanding of this new-in-pharmacotherapy drug for type 2 diabetes mellitus, thus helping clinicians in appropriate prescribing and its adequate clinical use.

Miroslav Radenkovic

Department or Pharmacology, Clinical Pharmacology and Toxicology, Faculty of Medicine, University of Belgrade, Belgrade, Serbia

Biography

Miroslav Radenkovic, MD, MS, PhD, a full-time professor at the Department of Pharmacology, Clinical Pharmacology and Toxicology, graduated from the Faculty of Medicine – University of Belgrade (FMUB) in 1995, and from 1996 he is working at the FMUB. He received an MS from pharmacology, board certified in Clinical Pharmacology, PhD from Medical Sciences, and a sub-specialization degree in Clinical Pharmacology - Pharmacotherapy in 1999, 2000, 2004, and 2016 respectively, from the FMUB, as well as Bioethics MS in 2021 from the Clarkson University, NYC, USA. From 2002 Dr. Radenković officially participated in several scientific projects supported by the Ministry of Science – Serbia; the Austrian Science Fund; as well as the NIH Fogarty International Center Project, USA. Dr. Radenkovic is a member of the Ethics Committee of Serbia.

Mucoadhesive electrospun fibers in oral drug delivery

The necessity of new systems for drug delivery in children due to the difficulty of the correct dose administration when the drug carrier is not easy to administrate. Mucoadhesive electrospun fibrous systems are an interesting alternative for the treatment of pathologies in the oral cavity due to their capacity to release pharmaceutical drugs at a fast and sustained rate. Electrospun fibers have many characteristics that make them ideal drug carriers for local delivery. Mucoadhesives fibrous systems of poly (vinyl alcohol) (PVA) and poly (vinyl pyrrolidone) (PVP) loaded with propranolol and dexamethasone phosphate will be discussed for their potential application in the oral cavity. Physicochemical (SEM, FTIR, TGA, DSC) and biological (MTT assay) characterization will be described in order to present the morphology, chemical composition, and thermal behavior of the fibrous mats, and cytotoxicity in fibroblast will be visualized, drug delivery rate, mucoadhesive and degradation rate will be also discussed. The evaluated mucoadhesive loaded fibers presented potential characteristics to be used in the oral cavity, where successfully tridimensional fibrous scaffolds were fabricated with an average fiber diameter of about 368 ± 161 nm, thermal stability higher than 250oC, fibers were degraded completely before 15 min and high mucoadhesive and biocompatibility in fibroblast were observed. PVP loaded fibers with dexamethasone phosphate are proposed for endodontic procedures avoiding injection of the anti-inflammatory drug and PVA loaded fibers with propranolol for the treatment of hemangiomas in children.

Luis Jesus Villarreal Gomez[1,2]*, Graciela Lizeth Perez Gonzalez[1,2], Jose Manuel Cornejo Bravo[2], Lucia Margarita Valenzuela Salas[3], Edgar Ramiro Mendez Sanchez[3], Ricardo Vera Graziano4, Alejandra Rocio Chavez Santoscoy[5]

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[5]Escuela de Ingenieria y Ciencias, Tecnologico de Monterrey, C.P. 64849. Monterrey, Nuevo Leon, Mexico

Biography

Dr. Luis Jesus Villarreal Gomez, studied Chemistry-Biology at the University of Sonora, Hermosillo, Mexico and graduated in 2004. He then received his Ph.D. degree in 2013 at the University Autonomous of Baja California, Tijuana, Mexico where he joined as a full research professor. Dr. Villarreal is founder and editor in chief of the Revista de Ciencias Tecnologicas (RECIT) (ISSN 2594-1925) and is editorial board member of several journals edited from MDPI, Hindawi, BenthamOpen, amongst others. Until now, he has published 35 papers and has reviewed more than 139 reviews. His research lines are biomaterials, tissue engineering, drug delivery systems, and biotechnology.

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14-15 SEPT

DAY 02

SPEAKERS

10TH EDITION OF
GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

Saad Tayyab

Department of Pharmaceutical Chemistry, Faculty of Pharmaceutical Sciences, UCSI University, 56000 Kuala Lumpur, Malaysia

Understanding hepatitis B virus inhibitor, clevudine transport in human blood circulation: An in vitro albumin binding study

Hepatitis B, a viral infection that can cause both acute and chronic hepatitis, cirrhosis and hepatocellular carcinoma, is a major global health issue. Hepatocellular carcinoma is one of the most common types of cancer, accounting for roughly 90% of all primary liver tumours. The virus replication is through reverse transcription and most antiviral drugs are nucleoside/nucleotide analogues. Clevudine, a nucleoside analogue licenced in Korea in 2006 has been found effective in controlling HBV infection. Interaction between a dug and the plasma protein is of pharmacological significance as this interaction could affect drug absorption, distribution, metabolism and excretion in the body as well as the physiological activity of the protein. Understanding such interactions offer information about drug-drug interaction, and drug-protein resistance and is helpful to predict potential drug dosages and adverse effects. Serum albumin, a 585 residue-long protein encompassing three domains, I, II and III with their divisions into two subdomains, A and B, is the main drug transporter in blood circulation. It possesses two well-defined drug-binding sites, namely, Site I (subdomain IIA) and Site II (subdomain IIIA). This talk will highlight the interaction results between clevudine and human serum albumin using a variety of spectroscopic techniques i.e., absorption, fluorescence, circular dichroism and atomic force microscopy along with molecular docking.

Biography

Dr. Saad Tayyab is currently working as a Professor of Pharmaceutical Chemistry in the Faculty of Pharmaceutical Sciences at UCSI University, Kuala Lumpur, Malaysia. Before joining UCSI University in June 2022, Dr. Saad served the University of Malaya (2004-2022) as a Professor of Biochemistry at the Institute of Biological Sciences of the Faculty of Science. He received his B.Sc. (Honors) in Chemistry (1979), M.Sc. in Biochemistry (1981), M.Phil. in Biochemistry (1983) and Ph.D. in Biochemistry (1987), all degrees from the Aligarh Muslim University, India. Earlier, he served the University of Kashmir, India, as a Lecturer in Biochemistry (1987-1988), the Aligarh Muslim University, India, as a Lecturer in Biochemistry/Biotechnology (1988-1992), Lecturer-Senior Grade in Biotechnology (1992-1997), Reader in Biotechnology (1997-2001) and Alemaya University, Ethiopia, as Associate Professor in Biochemistry (2001-2004) under World Bank (ARTP) Project. He was admitted as a Fellow of the Royal Society of Chemistry (FRSC), UK, in December 2017 and a Fellow of the Royal Society of Biology (FRSB), UK, in July 2019. He has been a member of the American Chemical Society since January 2020 and a Life member of the Malaysian Society for Biochemistry and Molecular Biology. Earlier, he received the Wood/Whelan Fellowship from IUBMB and ICSU for pursuing higher training at the Medical College of Georgia, Augusta, USA, during April/May 1994. Diagrams from his publications have been chosen for the journal cover page of Advances in Protein Chemistry and Structural Biology (2021) and Biopolymers (2020). One of his articles was selected in the 10th Anniversary Collection on Molecular Modelling of RSC Advances (2021). Dr. Saad is currently serving as the Editorial Board Member of Frontiers in Molecular Biosciences (since 2022), Protein and Peptide Letters (since 2019), Letters in Drug Design and Discovery (since 2015) and Biochemistry Research International (since 2013). He has also served as the Chief Editor of the Malaysian Journal of Biochemistry and Molecular Biology (2015-2017). Dr. Saad has published over 150 journal papers, 17 popular articles, 1 book, 1 book chapter, 1 learning aid and 3 book reviews. Several research students (16 Ph.D., 6 M.Phil., 1 M.D. and 13 M.Sc.) completed their degrees under his supervision, and he guided 32 undergraduate projects. His research interest includes drug-protein interaction, protein folding, protein/enzyme stability and protein structure-function. He possesses an h-index of 26, and his name is included in the reviewers' list of many international journals.

Panagiotis Mallis

Hellenic Cord Blood Bank, Biomedical Research Foundation Academy of Athens
National Tissue Typing Center, “G.Gennimatas” National Hospital of Athens, Greece

Mesenchymal stromal cells and immunoregulatory properties: Concerns and issues utilizing novel stem cell therapy as potential therapeutic strategy

Background: Accumulated evidence has emerged on the role of stem cells in key cellular functions such as their implication in host immune response and tissue regeneration. Currently, Mesenchymal Stromal Cells (MSCs), which are multipotent stem cells, have been used in a great number of clinical trials (> 1300 studies, worldwide), ensuring the safety and tolerability of these cells in several human disorders, such as autoimmune diseases, Graft Versus Host Disease (GvHD) and cancer. Lately, well-defined MSCs were used for the toleration of the acute immune response and cytokine release syndrome in severely ill COVID-19 patients. However, significant differences have been reported regarding immune modulation and tissue regeneration exerted by the MSCs. Late evidence has shown that inborn errors of immunity and the presence of different Human Leukocytes Antigens (HLA) may either prevent or promote the beneficial properties of MSCs towards human disorders.

Aim: This study aimed to the evaluation of the immunomodulatory and regenerative properties of MSCs by comprehensively investigating the HLA alleles.

Methods: MSCs derived from the human Wharton's Jelly (WJ) tissue and Bone Marrow (BM) were isolated, cryopreserved, expanded, and defined according to the criteria outlined by the International Society for Cell and Gene Therapies (ISCT). WJ and BM-MSCs were stimulated with a culture medium containing IFN-γ (50 ng/ μl), 1% penicillin-streptomycin, and 1% L-glutamine for 48 h. The quantification of IL-1Ra, IL-6, IL-10, IL-13, TGF-β1, VEGF-a, FGF, PDGF, and IDO was performed using ELISA kits. The expression of HLA-G1, G5, and G7 was evaluated in WJ and BM-MSCs. The determination of the HLA alleles of the MSCs was performed using the Next Generation Sequencing technology (HLA Holotype 11 loci, Omixon Inc., MiSeq, Illumina). The frequencies of the HLA alleles were estimated using the Arlequin and MEGA X software.

Results: Thawed WJ and BM-MSCs exhibited a spindle-shaped morphology, successfully differentiated to "osteocytes", "adipocytes", and "chondrocytes", and in flow cytometric analysis were characterized by positivity for CD73, CD90, and CD105 (> 95%) and negativity for CD34, CD45, and HLA-DR (< 2%). Moreover, stimulated WJ and BM-MSCs were characterized by increased cytoplasmic granulation, in comparison to unstimulated cells. The HLA-G isoforms (G1, G5, and G7) were successfully expressed by the unstimulated and stimulated WJ-MSCs. On the other hand, only weak expression of HLA-G1 was identified in BM-MSCs. Stimulated MSCs secreted high levels of IL-1Ra, IL-6, IL-10, IL-13, TGF-β1, FGF, VEGF, PDGF, and IDO in comparison to unstimulated cells ($P < 0.05$) after 12 and 24 h. Finally, macrophages derived from COVID-19 patients successfully adapted the M2 phenotype after co-culturing with stimulated WJ and BM-MSCs. Also, the most frequent HLA alleles were determined, to identify potential correlation with the MSCs´ immunomodulatory and regenerative properties.

Conclusion: Specific HLA alleles were correlated positively with the MSCs´ immune responses and regenerative properties. In this way, the establishment of a stem cell bank with specific MSCs lines may be performed, in order properly defined MSCs to be used for specific patients, thus bringing precision medicine one step closer to its clinical application.

Biography

Panagiotis Mallis gained his bachelor's degree (BSc) in Biomedical Sciences from the University of West Attica in 2010. In 2013, he received his master's diploma (MSc) and in 2018, received his PhD in Tissue Engineering and Regenerative Medicine from the Medical School of National and Kapodistrian University of Athens. Currently, Mallis Panagiotis is an affiliate scientist of the Hellenic Cord Blood Bank (HCBB). Panagiotis Mallis has extensive experience in Mesenchymal Stromal Cell (MSCs) isolation and in vitro manipulation. His current research involves the investigation of MSCs' immunoregulatory/immunosuppressive properties and their application in tissue engineering and regenerative medicine approaches.

M Borrell
IR Hospital de Sant Pau, Spain

Pcsk9's role in immunomodulation

Atherosclerosis, the leading cause of cardiovascular diseases, is driven by high blood cholesterol levels and chronic inflammation. The disruption of the hepatic interaction between Proprotein Convertase Subtilisin/Kexin 9 (PCSK9) and Low-Density Lipoprotein Receptor (LDLR) downregulates blood cholesterol levels and reduces cardiovascular events. Recent data suggest that other members of the LDLR superfamily may be targets of PCSK9.

In this presentation I will show that LDLR-Related Protein 5 (LRP5) is a PCSK9 target, and both proteins participate in foam cell formation and hence, in the mechanism of lipid accumulation and atherosclerotic plaque formation.

I will first show that LRP5 is needed for macrophage lipid uptake since LRP5-silenced macrophages have less intracellular cholesterol accumulation. Immunoprecipitation experiments will show that LRP5 forms a complex with PCSK9 in lipid-loaded macrophages opening the possibility that PCSK9 induces lysosomal LRP5 degradation in a similar manner than it does with LDLR. We have also studied the role of PCSK9 and LRP5 in the inflammatory response by TLR4/NFkB signaling pathway and show that PCSK9 gene interference decreases inflammation supporting a role for PCSK9 as an inflammatory mediator in atherosclerosis.

We then validated our results in an in vivo mice model. We analyzed the differential expression of cholesterol related genes and proteins including LRP5, PCSK9, VLDLR, LRP6, LRP2 and LRP1 in Wildtype (Wt) and LRP5 knock-out (Lrp5-/-) mice fed a Normocholesterolemic (NC) or a Hypercholesterolemic (HC) diet. Lipid uptake was studied in liver resident cells (HepG2) and in liver fat storing cells (hepatic stellate cells) with and without LRP5 and PCSK9. Results show that cholesterol accumulates in livers of Wt and Lrp5-/- mice. This accumulation can be explained by the increased expression of LRP receptors in HC Wt mice or scavenger receptors in HC Lrp5-/- mice. More importantly, PCSK9 and LRP5 bind intracellularly in fat storing liver cells but not in structural liver cells and both proteins are needed for lipid uptake.

Keywords: PCSK9, Cholesterol Uptake, LRP5, Hypercholesterolemia.

Biography

Dr. Borrell is a senior investigator in the Cardiovascular Program at the Hospital de la Santa Creu i Sant Pau, Barcelona. Prior appointments include a postdoctoral position in the Neurology Department of the Curie Institut, Paris, France studying Huntington's disease. She leads a project based in lipoprotein receptors role in cholesterol metabolism. In the recent years she has been developing a project that analyzes the function of PCSK9 beyond its canonical function in cholesterol lowering. These results have been published in different journals including EHJ, BRIC or CVR and lead to the concession of projects financed by both, the government and the industry.

Rudra Pratap Singh Rajput[1]*, H V Gangadharappa[2], Anshita Gupta Soni[3], Deepak Kumar Dash[1]

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Formulation, characterization and evaluation: Micellar loaded complex of cuminum cyminum to treat causing disease of COVID 19 (respiratory infection)

Background: Coronaviruses are a family of viruses that can cause illnesses such as the common cold, Fever, Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), Cancer, Asthma etc. Respiratory Infection (RTI) is a viral spreading disease and it transmits from individual to individual, particularly in youngsters and aged peoples. The treatments are available but have so many limitations. To treat RTI, the phyto-constituent antibacterial drug cuminaldehyde (Cuminum Cyminum L.) was selected but it exhibits low bioavailability, poor water-solubility and is rapidly eliminated from the body.

Objectives: To overcome these issues, novel drug delivery (nanoparticle) based micellar loaded complex approach was adopted.

Methods: In this study, the Micellar (CM) was prepared by mixing of cuminaldehyde and soya lecithin using anti-solvent precipitation technique and further the Micellar Loaded Complex (CMLC) was prepared by loading of Micellar (CM) in aqueous solution of chitosan. The physical compatibility studies by DSC and FT-IR, demonstrated the confirmation of CMLC with soya lecithin and chitosan.

Results: The optimized CMLC and CM were irregular particle shapes and crystalline structures, with a mean particle size of 279.10±0.02 nm, 296.24±0.10 nm and zeta potential of -8.18 mV, -8.77 mV, respectively. The % entrapment efficiency and % drug loading of CMLC (72.13±0.26 %, 06.46±0.01 %) and CM (89.09±0.20%, 08.05±0.19 %) was found efficiently. The in vitro release rate of CM (88.09±0.41 %) was slower than CMLC (89.02±0.06 %) in pH 7.4 phosphate buffer up to 24 h by diffusion process (Korsmeyer Peppas model).

Conclusion: Furthermore, CMLC has shown the potent in vitro antioxidant activity, susceptible antibacterial activity and significant anti-inflammatory activity as compared to CM against stress, microbial infection (S. aureus and E. coli) and inflammation which were causable reason for the respiratory infections. CLMC has shown the significant bioavailability and more efficient hematological parameters value on rabbit blood against the incubation of bacterial organism. CLMC may have the effective potential to treat causing disease of COVID 19 i.e. RTI.

Biography

Dr. Rudra Pratap Singh Rajput completed Ph.D at JSSAHER, Mysuru (Karnataka) in 2018. Further, He joined as Assistant Professor in Jeypore College of Pharmacy, Odisha in Aug, 2018 and continued his academic profession in Columbia institute of Pharmacy, Raipur since 29th April, 2019 to 17th Feb, 2023. Further He joined to Royal College of Pharmacy, Raipur on 18th Feb, 2023 and continuing till date. He has supervised 8 degree and 7 post graduation students to accomplish project dissertation work. He has more than 33 publication in SCI(E) indexed reputed journals. He also received an international travel grant from ICMR, New Delhi to present his work on international platform. He actively participated in various national and international conferences.

Preeti Sharma[1]*, Pradeep Kumar[1], Parmit Kumar[2]

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Apoptosis in colon cancer cell line through down-regulation of AKT pathway

Background: Cancer is a major cause of morbidity and mortality worldwide. Small heterocyclic molecules are promising anti cancer molecules. Imidazoquinoxaline derivatives induce apoptosis in colon cancer cell line HCT-116 and Breast cancer cell line MDA-MB-231.

Aim: Investigation of Anticancer mechanistic of Imidazoquinoxaline derivatives in Breast cancer cell and colon cancer.

Result: In MDA MB-231 breast cancer cell and HCT-116 Colon cancer cell, Imidazoquinoxaline derivatives (RA 22) down regulate the signaling pathway such as AKT, ERK and STAT 3 & increase the cleavage of PARP, Caspase-3 and Caspase-9.

Conclusion(s): The present study demonstrated that Imidazoquinoxaline derivatives inhibited colon and breast cancer cell viability through activation of apoptosis and cell cycle arrest by increasing the cleavage of PARP, Caspase-3 & Caspase-9. Therefore, Imidazoquinoxaline derivatives can act as a therapeutic molecule for the treatment of colon cancer.

Audience Take Away Notes

- Researchers working in this area will come to know of potential of imidaxoquinoxaline derivatives as anticancerous agent, Studies can further be propagated using other cell lines to better understand its activity spectrum. The study out come will be added as new information to the preexisting knowledge about various generations of anticancer agents

Biography

Motivating and talented Biochemistry Professor, driven to inspire students to pursue academic and personal excellence. Consistently strive to create a challenging and engaging learning environment in which students become lifelong learners. Exceptional track record of research success with multiple published articles. Dr. Preeti Sharma is currently working in Department of Biochemistry, Autonomous State Government Medical College, Uttar Pradesh, India, deeply involved in teaching and research. Her area of research has been interdisciplinary including Drug Metabolism, Pharmacokinetics and Inflammatory Markers, Immunology. She has more than 135 publications (research and review articles) with high citation and few in phase of communications. She also wrote 2 books on Bio-organic Chemistry and Basics of Immunology. She is member of various professional bodies and has participated and presented number of papers in national and international conferences. She is frequently invited as international speaker and currently she is global cooperative research consultant. She is credited with a number of ICMR (Indian council of medical Research)-STS funded projects and has guided and co-guided a number of Ph.D and MD students in the field of Medical Biochemistry. She is awarded International Scientist award in 2020 and research excellence award in 2021, International education award 2021 for his exceptional contribution to research & teaching respectivel. During the pandemic she has been deeply involved in covid related research. Her contributions to covid-19 research in published in various publications and recently she was awarded Uttar Pradesh Government DGME corona worrier award 2022.

Zinnet Sevval Aksoyalp
Department of Pharmacology, Faculty of Pharmacy, Izmir Katip Celebi University, Izmir, Turkey

Sustainable management of pharmaceutical waste: Smart labeling for the reuse of unexpired medications

Pharmaceutical waste constitutes a significant environmental challenge, with millions of dollars worth of unused medications being discarded annually. The mismanagement of pharmaceutical waste not only poses a critical ecological problem but also imposes a substantial global economic burden. Medicinal products that have exceeded their expiration dates or have been stored under improper conditions may exhibit issues related to efficacy and safety, rendering them unsuitable for patient consumption. Such medications often dispose of in bins, sinks and natural environments. However, these medicines should be returned to healthcare providers (hospitals, pharmacies, etc.) to ensure proper disposal. Beyond expired medicines, unused medications are also discarded due to treatment failure, adverse effects, patient non-compliance, and mortality. Rather than being discarded into the environment by patients, the potential reuse of these medications can have both economic and environmental advantages.

Organizations collect unused and unexpired medicines for redistribution to individuals in need. Notably, two such organizations in the United States are SafeNetRx, established in 2001, and SIRUM, which has been in existence since 2005. In Greece, GIVMED has facilitated the utilization of unexpired medicines by other patients since 2016. These initiatives provide medicines to thousands of disadvantaged individuals in the US and Greece, thereby mitigating drug waste and environmental pollution. While initiatives exist in the UK and the Netherlands to redistribute returned drugs, these initiatives are yet to be implemented. The reuse of these medicines may understandably raise concerns about the stability and safety of the medicines. However, survey studies reveal that a majority of patients are willing to use returned medications provided their quality and safety are assured.

Medications are stored under optimal conditions of temperature, humidity, and light to maintain their stability and are transported and stored under these conditions in the manufacturing company, drug stores, pharmacies, and healthcare facilities. However, once these medications are dispensed to patients, there is no system for tracking them. Patients may expose medications to unsuitable temperature and humidity conditions such as kitchens, bathrooms, balconies, and car compartments. The implementation of smart labelling can provide information about post-use storage conditions, thereby benefiting both users and others. Studies conducted in pursuit of this objective have explored the concept of the Internet of Things and the utilization of RFID technology. Furthermore, to maintain the integrity of the medicine, it is recommended to use a hologram to protect the medicine box from tampering.

In conclusion, the development and adoption of smart labels to ensure the quality and safety of pharmaceuticals could potentially redirect unused drugs from waste to patients requiring them. These labels have the potential to deliver global economic and environmental benefits.

Keywords: Drug Disposal Bag, Medicines Reuse, Pharmacoeconomics, Pharmacopollution, Recycle, Reverse Logistic.

Audience Take Away Notes

- The audience will understand the potential concerns regarding the reuse of medications and the importance of assuring quality and safety for returned drugs
- Attendees will learn about existing initiatives, such as SafeNetRx, SIRUM, and GIVMED, that redistribute unexpired medications to disadvantaged individuals, mitigating waste and pollution
- The audience will gain insights into the potential of smart labels to redirect unused medications from waste to patients in need, leading to economic and environmental advantages
- The implementation of smart labelling and quality assurance measures can lead to improved patient safety by ensuring the integrity of medications, thus enhancing the quality of patient care

Biography

Dr. Zinnet Sevval Aksoyalp received a bachelor's degree at Ankara University Faculty of Pharmacy in 2014 and then a PhD degree in Medical Pharmacology at Akdeniz University in 2019. She has been working as a research assistant at Izmir Katip Celebi University, Faculty of Pharmacy, Department of Pharmacology since 2020. Research interests are cardiovascular pharmacology, sex differences in pharmacology, pharmacovigilance, gut microbiota, and drug reuse. She is a member of the Turkish Pharmacology Society.

Suresh P K

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Natural molecule-encapsulated liposome-based formulations for dermal and transdermal applications for cancer therapeutics

Based on the current and future market trends, liposome-based drug delivery systems is expected to have a phenomenal market size of 10 billion US dollars by the year 2035. The market potential has culminated in the synthesis and characterization of several liposomal products and are currently in the different phases of development with some of the products having crossed the third phase of the clinical trials. Also, several products have been patented and these include different drugs and drug combinations (doxorubicin, paclitaxel, cisplatin, and vincristine. Different methods have been employed for the synthesis and characterization of the different types of liposomes (conventional, charged, stealth, actively targeted, stimuli-responsive, bubble, Solid Lipid Nanoparticles, Nanostructured Lipid Carriers, nonlamellar lipid nanoparticles, ethosomes, echogenic liposomes) with different compositions, thereby being critical determinants of their physicochemical properties influencing their stability; encapsulation efficiency and drug release behavior as well as the penetration/retention in the dermal compartment. Other categories of liposomes (for e.g., niosomes6 and ultra-deformable liposomes/transfersome) have shown potential as drug delivery tools for dermal8 and transdermal applications. Since most of the drugs currently deployed in the developing world are from natural sources (generally considered to be relatively less toxic), and have limitations in terms of bioavailability, stability and uptake, it is logical to consider liposome-encapsulated natural molecules (for e.g., flavonoids -an important category of polyphenolics and stilbenoids -for example Pterostilbene9) including targeted approaches to overcome these hurdles in the drug development process. For example, a combination of software, thermal-based method, FT-IR, AFM and SEM-based morphology strategies were employed to demonstrate increased permeation (reversible alterations at the surface) and drug deposition with rat skin as the model system. Our work involved the demonstration of a reduction in IC50 and an increased activation of a marker enzyme (caspase-14 -involved in terminal differentiation processes in the cornifying layers of the huma epidermal compartment) in HaCaT cells treated with un-encapsulated and encapsulated luteolin. This work substantiated our earlier work, wherein we showed that Luteolin increased the terminal differentiation process in HaCaT in comparison with Vitamin D3 (our reference molecule). In addition, others have reported that Luteolin-loaded elastic liposomes (based on ex vivo rat skin-based permeation studies as well in MCF-7 based cytotoxicity studies) have facilitated delivery of the drug through the transdermal route and have potential for the elimination of breast cancer cells. It is obvious that the whole process of the development of liposome-based nano-formulations should be paralleled with their testing in suitable in vitro model systems representative of dermal/systemic cancerous conditions (local/surface accumulation versus systemic absorption) as well as suitable healthy tissue as controls, that can reduce, if not replace, the costly and time-consuming tests involving animals as the well address the serious ethical concerns raised with respect to their use for drug testing purposes.

Audience Take Away Notes

- Understand and apply the knowledge gained from this lecture -translational research in liposome-based delivery systems

- Scientists/Technicians specifically in this area of drug delivery systems will benefit from this presentation
- Scientists in the area of parent molecule research can extend their research activities to addressing solubility/permeability-related bioavailability concerns
- Solutions for designing drug delivery systems
- This approach can also potentially address side-effects/dose-limiting toxicity issues
- Possibly provide a medium for international collaborations with partners interested in this topic

Biography

He is a Professor Higher Academic Grade (PHAG) in the School of Biosciences and Technology, VIT, Vellore, India. He has approximately 24 years of teaching and research experience. He received his masters and Ph.D. in SIUE, IL, USA and the University of Cincinnati, Ohio, USA respectively. He was a Postdoctoral fellow at the University of Texas at Austin and Rutgers University, USA. P.K. Suresh has authored/co-authored 65 publications (h-index of 16 and a citation index of 797). He has been a resource person and/or coordinator in FDPs and in International Conferences. He is involved in drug development and delivery systems.

Anjali Pandya, Vandana B Patravale*

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Oral mixed micellar system for peptide delivery

Peptide based therapeutics, in the current biopharmaceutical market, are majorly available as parenteral formulations. Inherent physicochemical properties of peptides including hydrophilicity, bulky size, enzymatic degradation, and stress induced denaturation make their delivery challenging. Global quest for delivery of biomolecules by non-invasive routes like nasal, oral, transdermal, or pulmonary has been ongoing with limited commercial success. When dealing with the chronic conditions like osteoporosis, diabetes, etc., patient adherence is critical, emphasizing the need for non-invasive therapy. Salmon calcitonin is a 32 amino acid peptide which is approved by the US FDA for use in Postmenopausal Osteoporosis (PMO), hypercalcemia, and Paget's disease, mandating long-term therapy. First part of the project was designed for development of oral peptide formulation by devising suitable delivery strategies. As a part of pre-formulation, computational tools viz. molecular docking and molecular dynamics simulations were used for the development of a prediction module. A library of excipients was screened along with an in-house synthesized lipomer P-lipid, which was found to exhibit a remarkable dual mechanism to enable chymotrypsin inhibition and intestinal membrane permeation, further demonstrated via ex vivo studies. Preliminary evaluation of P-lipid showcased its surfactant property and thus a lipid based mixed micellar system was developed. P-lipid based mixed micelles loaded onto silica carrier enabled oral delivery of salmon calcitonin using enteric coated capsules. The capsules were evaluated for in vitro pharmacopeial parameters followed by in vivo X-ray imaging which confirmed jejunal release of the capsule contents. The results obtained in the in vivo pharmacokinetic studies reveal affirmative prospective of this proof-of-concept platform for oral delivery of peptides.

Audience Take Away Notes

- The audience will learn how to decrease time for formulation based on in-silico approach
- Also, they would learn use of simple, cost effective systems for peptide delivery as well as its characterization. They would get an insight into various invivo studies undertaken
- The study presented is a multidisciplinary study. The audience can either use the concept for their own research or for guiding their research scholars
- Sure. The concepts can be used to expand their research and teaching. Collaborations could be established if researchers are interested to use our platform
- The study presented does provide a technology amenable for scale up and therefore it could be used not only for the peptide studied but various other peptides with similar physico -chemical properties.
- Yes. Use of a novel synthesized lipid will be a new information
- List all other benefits
    - The developed technology is simple, cost effective, stable and scalable for delivering peptides by oral route

Biography

Prof. Vandana Patravale is a Professor of Pharmaceutics at the Institute of Chemical Technology, Mumbai, India. Her research interests include development of nano-carriers with major emphasis on malaria, cancer and neurodegenerative disorders; medical device development, nano-diagnostics and nano-vaccines. She has over 200 refereed publications, 2 books, 25 book chapters, 30 granted patents, and 2 trademark registries. She is the Vice President, CRS-Indian Chapter. She has completed Indo-Swiss, Indo-Japan, Indo-UK projects and is a recipient of Bill Melinda Gates Grant Award, 2015. She has transferred many technologies to industries including drug eluting stents, which are being marketed in about 65 countries.

Geetanjali Sageena

Division of Basic Medical Sciences, Indian Council of Medical Research, New Delhi, India

Artificial intelligence based strategy for personalized medicine

While AI technologies are rapidly developing in medicine, their implementation in daily care is not yet a reality and we should not be overwhelmed by the challenges we face, but instead use resources to develop AI concepts in pharmacogenomic therapies, to make them safer and more practical, and therefore more beneficial for everyone. Adverse drug reactions place a significant burden on the global healthcare system, yet a significant proportion of adverse drug reactions go unreported, leading to bottlenecks in getting proper treatment. This problem is much more pronounced in Lower-Middle-Income Countries (LMICs). Despite significant improvements in adverse reaction reporting, the adverse reaction reporting rate remains high with a well-organized pharmacovigilance program in a country like India. An even greater focus on training healthcare professionals in knowledge-based attitudes and practices is likely to further improve adverse event reporting and lead to safer drug use. Combining pharmacogenomics data with artificial intelligence offers exciting opportunities to identify key clinical execution gaps that link rare variants to patient care.

Biography

Geetanjali Sageena completed her graduation and post-graduation from the University of Delhi in 2008 and 2010 respectively. She did her Ph.D. from the Department of Zoology, University of Delhi in 2016. She has worked as an Assistant professor at Keshav Mahavidyalaya, University of Delhi. Currently, she is working as Scientist B with the Indian Council of Medical Research Delhi headquarters. Her research interests are focused on Genomics and Human Health. She has published more than 25 research articles in various journals of repute.

Delia Teresa Sponza

Dokuz Eylul University, Engineering Faculty, Environmental Engineering Department, Buca Izmir, Turkey

Photodegradation of tetracycline using ZnO/Fe_2O_3 nanocomposite

Tetracyclines (TC) are a class of broad-spectrum antibiotics widely employed to treat various human and animal bacterial infections. Due to their incomplete adsorption and partial metabolization by humans and animals, more than 70% of the TC used for pharmacological treatment are excreted by feces and urine in zootechnical liquid waste and in municipal wastewaters. In order to remove this antibiotic from a pharmaceutical industry wastewater Zinc Oxide (ZnO) and iron oxide Fe_2O_3) was developed and its photocatalytic properties were investigated. ZnO/Fe_2O_3 Nanocomposite was characterized by Field Emission Scanning Electron Microscope (FESEM), X-Ray Fluorescence (XRF) and Brunauer–Emmett–Teller (BET) analysis. The performed photocatalytic experiments clearly demonstrated that the ZnO/Fe_2O_3 composite catalyst exhibited excellant photocatalytic activity to remove TC with yields as high as 99%, after 20 min contact time, at 2,2 mg/l ZnO/Fe_2O_3 concentration at a power of 34 W/m at 22 Oc at a Ph OF 6 The presence of iron oxide in the structure of the catalyst was enhanced the surface area and the pore volume, and an optimize photodegradation yield was detected. The nanocomposite was reused 30 times with photodegradation yields as high as 98 and 99%.

Ravi P Sahu

Department of Pharmacology and Toxicology, Boonshoft School of Medicine, Wright State University, Dayton, OH, United States of America

Mechanisms of chemotherapy drug-induced microvesicle particles release

Chemotherapy has remained the mainstay for the treatment of multiple types of cancers. In particular, topical use of chemotherapy has been used for skin cancers. Though effective, topical chemotherapy has been limited due to adverse effects such as local and even systemic toxicities. Our recent studies demonstrated that exposure to pro-oxidative stressors, including therapeutic agents induces the generation of extracellular vesicles known as Microvesicle Particles (MVP) which are dependent on activation of the Platelet-Activating Factor-Receptor (PAFR), a G-protein coupled receptor present on various cell types, and Acid Sphingomyelinase (aSMase), an enzyme required for MVP biogenesis. Based upon this premise, we tested the hypothesis of whether topical application of gemcitabine will induce MVP generation in human and murine skin. Our ex vivo studies using human skin explants demonstrate that gemcitabine treatment results in MVP generation in a dose-dependent manner in a process blocked by PAFR antagonist and aSMase inhibitor. Importantly, gemcitabine-induced MVPs carry PAFR agonists. To confirm the mechanisms, we employed PAFR-expressing and deficient (Ptafr-/-) mouse models as well as mice deficient in aSMase enzyme (Spmd1-/-). Similar to the findings using human skin explants, our studies demonstrate that gemcitabine-induced MVP release in WT mice was blunted in Ptafr-/- and Spmd1-/- mice. These findings demonstrate a possible mechanism by which local chemotherapy can generate bioactive components as a bystander effect in a process that is dependent upon the PAFR-aSMase pathway.

Audience Take Away Notes

- Despite the fact that chemotherapeutic agents are mostly used systemically, a few of them, including gemcitabine have also been used topically for skin conditions such as skin cancer, actinic keratosis, etc. However, topical chemotherapeutic agents are often associated with side effects such as skin rash, skin necrosis, etc. In this research, we determined the impact of topical gemcitabine-induced effect, in particular, secretion of Microvesicle Particles (MVP), which carry bioactive components such as PAF lipids. Overall, the audience will learn possible strategies to mitigate topical gemcitabine-induced effects
- The knowledge gained via these studies can prepare audience if they are applying for related research jobs in pharmaceutical industries
- Yes, faculties often get novel ideas from research studies of other participants
- Yes. Cancer researchers and medical oncologists are exploring novel strategies to overcome the ongoing challenges associated with FDA-approved therapeutic agents. Our studies provide one of the possible approaches that could be used to explore these strategies
- Yes, it improve the accuracy of a design, or provide new information to assist in a design problem

Biography

Dr. Ravi P. Sahu completed his Ph.D. from Sanjay Gandhi Post Graduate Institute of Medical Sciences, India. He then pursued his postdoctoral studies from 3 different US universities, including Indiana University School of Medicine. He is an Assistant Professor in the Department of Pharmacology & Toxicology at Boonshoft School of Medicine, Wright State University in Dayton, Ohio. His lab has been focused on determining the mechanisms by which oxidized lipids, platelet-activating factor (PAF) impact cancer growth and efficacy of therapeutic agents. He has published over 70 articles and serves as an Editorial Board Member and Reviewer for several scientific journals.

Tarek Aboul Fadl

Department Medicinal Chemistry, Faculty of Pharmacy, Assuit University, Assuit 71526, Egypt

Thiadiazine-2-thione derivatives as new carrier systems for isothiocyanates and dithiocarbamic acid with potential anticancer activities

Cancer remains a global public health concern due to its morbidity and mortality, and anticancer agents are crucial for the control and eradication of cancers. According to the International Agency for Research on Cancer. Although cancer chemotherapy has progressed in major strides in recent years, there is still an unmet need for new anti-cancer agents with good potency, diminished toxicity and able to treat tumors that are resistant to currently known drugs.

Isothiocyanates isolated from cruciferous vegetables have been identified as potent anticancer agents in animal and human epidemiological studies. They were reported to induce cell cycle arrest that nominates them as chemotherapeutic agents in cells with multidrug resistance phenotypes. Furthermore, dithiocarbamic acid derivatives have received much attention due to their cancer chemopreventive and anticancer action activities. Additionally, Tetrahydro-(2H)-1,3,5-Thiadiazine-2-Thione (THTT) nucleus has been verified for their different biological activities including anticancer activities. It has been postulated that the biological activity of THTT is mainly dependent on isothiocyanates and dithiocarbamic acid species that are generated in the biosystem upon hydrolysis. Encouraged by the above and in continuation of our synthetic work on THTT it seemed interesting to prompted to develop THTT as a new class of carriers to these active species of molecules.

Audience Take Away Notes

- Development of new Drug Delivery System
- Potential of Structure based drug design for drug discovery and development
- How to improve the activities of the current clinically approved drugs
- Opening the windows for global scientific collaborations
- Improvement of the accuracy of drug design and providing new information to assist in solving drug design problems

Biography

Prof. Tarek Aboul-Fadl has completed his PhD in Medicinal Chemistry from Assiut University, Egypt (1994) under the channel system and joint supervision scheme between Assiut University and Josai University/Japan. He performed his postdoctoral training as a postdoctoral research fellow and scientist of Pharmaceutical and Medicinal Chemistry at University of Vienna, Austria (1997- 1998), Friedrich-Alexander- Universitat, Erlangen-Nurnberg, Germany (1999 and 2013) and University of Utah, USA (2001-2002 and 2004-2005). He has over 85 publications and 4 patents that have been cited over 2065 times, and his publication H-index is 23(google scholar), 21(Scopus). He awarded ACDIMA Research Award for the Best Scientific Research in Arab World, 2012.

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Notes

"We wish to meet you again at our upcoming events next year..."

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