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12th Edition of Global Conference on

Pharmaceutics and Novel Drug Delivery Systems

11-13
September, 2025

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BOOK OF ABSTRACTS

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12th Edition of Global Conference on

Pharmaceutics and Novel Drug Delivery Systems

SEPTEMBER 11-13

BOOK OF **ABSTRACTS**

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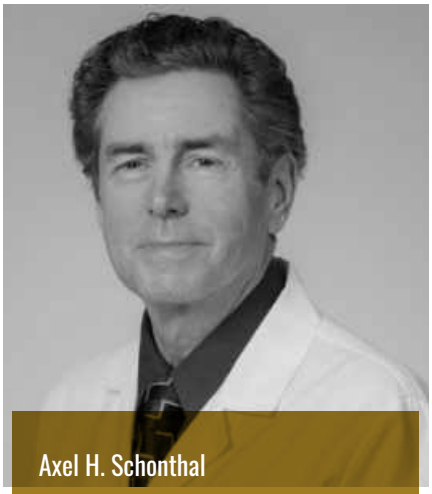

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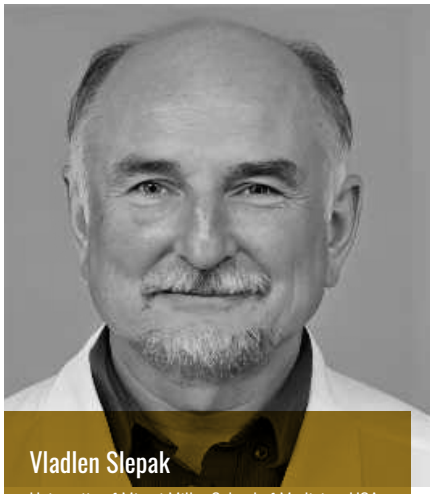

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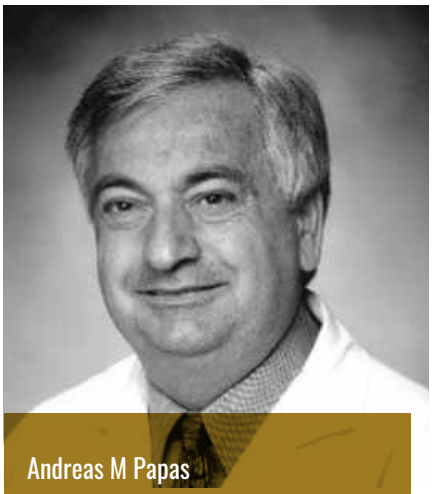

Andreas M Papas
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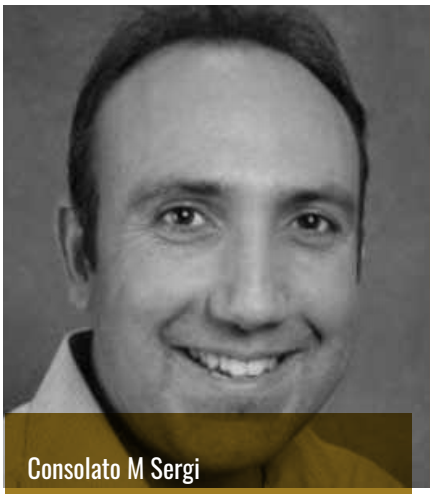
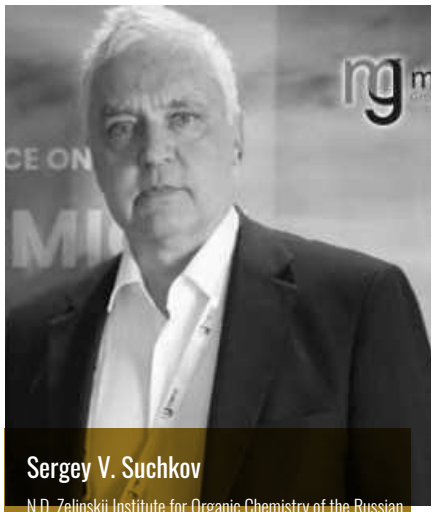


Consolato M Sergi
University of Ottawa, Canada



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Saad Tayyab
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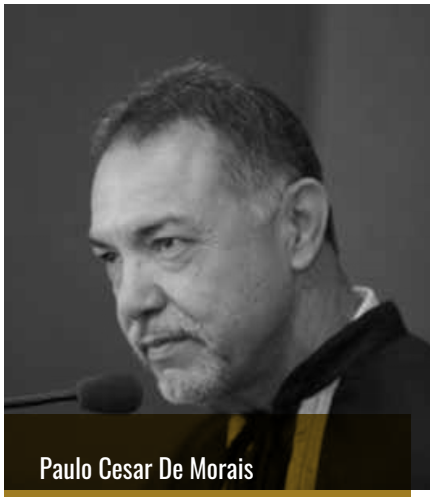
Keynote Speakers



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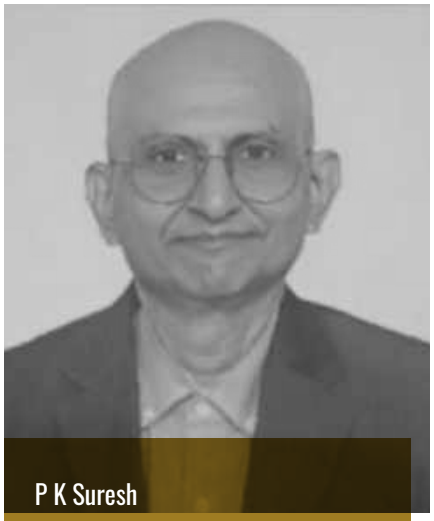


P K Suresh
Vellore Institute of Technology, India

Madhav Bhatia
University of Otago, New Zealand

Huiqin Yang
ICON Clinical Research Ltd, United Kingdom

Thank You All...

Welcome Message

Dear Distinguished Participants,

It is my great pleasure to welcome you to the *12th Edition of the Global Conference on Pharmaceutics and Novel Drug Delivery Systems* (PDDS2025), taking place in the vibrant city of Valencia, Spain during September 11-13, 2025. This year's hybrid format offering both in-person and virtual participation—provides a unique opportunity for international collaboration, knowledge exchange, and innovation under the theme "*Pioneering Pharmaceutics: From Discovery to Delivery*."

PDDS2025 will showcase the latest advancements, research breakthroughs, and strategic developments across a broad spectrum of pharmaceutics. Over the course of the event, we will delve into topics including formulation technologies, advanced drug delivery systems, drug discovery and development, biodrugs, and biotherapeutics, among others.

This congress brings together leading experts, researchers, and healthcare professionals from around the world to share their insights, experiences, and visions for the future of pharmaceutical science. As we explore the frontiers of emerging technologies in pharma, your active participation will be vital in driving meaningful discussions and fostering impactful collaborations.

We encourage you to fully engage in the sessions, ask questions, and contribute to the dialogue. These exchanges are designed to spark new ideas and inspire future research.

Thank you for joining us in Valencia. Together, let's pave the way toward a healthier future through innovation and excellence in pharmaceutics. I wish you a rewarding, insightful, and inspiring conference experience!

Saad Tayyab

UCSI University, Malaysia

Welcome Message

Dear Conference Attendees,

It is an honor and great pleasure to write a few welcome notes for the session entitled “Nanotechnology in Pharmaceutics”. The impact of Nanotechnology in Pharmaceutics has been tremendous in recent years, and nanoscale material systems take a central role in fostering the development of new Drug Delivery Systems. The new pharmaceutical strategies provided by nanotechnology have shown increasing drug efficacy and improved safety while offering solutions for target drug delivery, controlled release, and enhanced bioavailability, resulting in better therapeutic outcomes with reduced side effects. Moreover, nanotechnology took the central stage position in the recent development of Precision Medicine, in contrast to the one-size-fits-all paradigm. The PDDS 2025 will be a great opportunity for the participants including students and academicians, young and senior researchers, scientists, and clinicians to gain knowledge with the up-to-date research in nanotechnology in pharmaceutics and drug delivery systems.

Paulo Cesar De Morais

Catholic University of Brasilia, Brazil

Welcome Message

Dear Conference Visitors:

As the Conference Organizing Committee Member, the Session Chair and Keynote Speaker, I am very honored and pleased to write these welcome notes.

The current conference, PDDS 2025, will bring together leading researchers, scientists, clinicians, and industry professionals from the pharmaceutical and drug delivery fields around the world to discuss the latest, energizing, and innovative cellular targeting, vaccine design, pharmaceutical microbiology, and nanotechnology, ensuring a comprehensive approach to understanding the challenges and innovations shaping the future of drug delivery.

PDDS 2025 will include outstanding keynote sessions, plenary lectures, invited speeches, research presentations, technical demonstrations, and panel discussions around the world. One can expect that all these latest cutting-edge presentations and demonstrations will significantly advance almost all aspects from a complete overview of the current landscape and future possibilities to the scientific and regulatory aspects of the industry to unique interdisciplinary pharmaceuticals and drug delivery studies.

I am very excited to look forward to meeting with you at this fantastic upcoming conference.

Yong-Xiao Wang

Albany Medical College, USA

Welcome Message

Dear Colleagues, Scientists, Bioengineers, Drug Designers and Pharmacists, Clinicians and Friends,

Following the success of the 11th Edition of Global Conference on Pharmaceutics and Novel Drug Delivery System, we are pleased to host the next, 12th edition to be held in September 11-13, 2025, in Valencia, providing a Forum for scientists and students from universities, research institutes, and the pharmaceutical industry worldwide to share exciting results and build new collaborations.

Valencia as a unique historical place sitting on the banks of Turia, enriched with a wide array of traditions and popular celebrations, a Spanish Capital of real literary treasures and literary tour-ism, and merely a pretty and tasty city worth of visiting to enjoy a phenomenal network of asso-ciated symbols and forms, and thus offering you a kaleidoscope of brilliances.

This Event is contributing to the further improvement of modern pharma and pharmaceutical technologies in its very broad scope of fields, trends and applications, including organic and physical chemistry, medicinal and pharmaceutical chemistry, drug discovery and development, surface and biointerface chemistry, formulation technologies, rational and computer-aided drug delivery systems, advanced drug discovery and development, innovative biodrugs and biother-apeutics. This Global Event will be one of the great platform is to share our thoughts and ex-change ideas on how to chart our journey forward to reach new heights, since the strategic goal of the Conference is to promote translational and research and developmental activities in Drug Discovery and Novel Drug Delivery Systems.

A special attention would concern the impact of nanotechnology in pharmaceutics, nanoscale biomaterial systems and the integrated pharmaceutical strategies provided by nanotechnology, which take a central role in fostering the development of new medicines and drug delivery carri-ers and offering solutions for target drug delivery, controlled release, and enhanced bioavailabil-ity, resulting in better therapeutic outcomes with reduced side effects.

In reality, this Event serves as a vital platform for professionals from diverse fields to come to-gether and exchange ideas, share insights, and forge new partnerships. Therefore, another goal is to promote scientific information interchange between researchers, drug designers, biode-velopers, students, and practitioners working in the Grand Pharma-related World. And the third goal is the perfect blend of learning and networking, whilst assembling a group of world leaders in the expanding pharmacy fields. The Conference is a distinguished event offering a unique opportunity to explore and discuss the latest developments, breakthroughs, and challenges in the realm of drug delivery, and, globally, in the latest trends in Design-inspired Biomanufacturing and Biopharma as a whole.

We would like to take this opportunity to encourage you to attend and participate in this unique Conference to benefit from the latest scientific findings and milestones in the field of pharma-ceutical science. We extend our gratitude to our sponsors, partners, and exhibitors for their in-valuable support and contributions, which have been instrumental in making this event possi-ble. We hope you gain an insight into novel, cutting-edge translational technologies from bril-liant experts, exuberant researchers, and talented student communities, and do hope to see you all in Valencia on September 11-13, 2025, to enjoy the event along with the exceptional beauty of the ancient, modern simultaneously and unique Valencia globally.

Sergey Suchkov

N.D. Zelinskii Institute for Organic Chemistry of the Russian Academy of Sciences & InMedStar, Russian Federation

Welcome Message

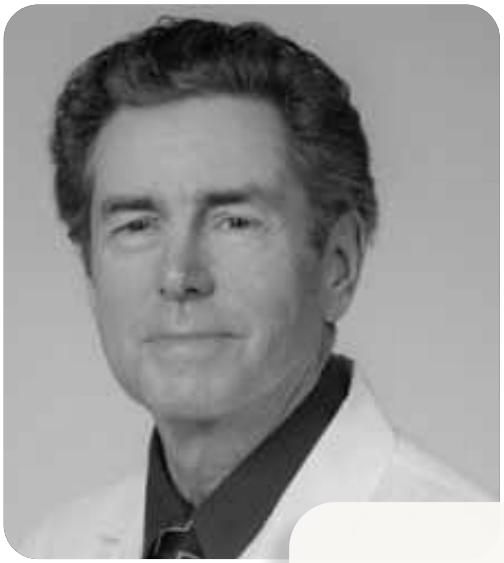
Esteemed Conference Participants,

I am honored and privileged to welcome you at the PDDS 2025. The "12th Edition of the Global Conference on Pharmaceutics and Drug Delivery Systems" (PDDS 2025), scheduled for September 11-13, 2025, is a dynamic hybrid event, which will enable participants to select either in-person attendance in Valencia, Spain, or a virtual experience.

As in previous years, PDDS brings together a diverse community of pharmaceutical professionals, researchers, scientists, and industry specialists. Under the theme “Pioneering Pharmaceutics: From Discovery to Delivery,” PDDS 2025 reaffirms its commitment to addressing global challenges and advancing scientific research in the field will cover a wide range of areas, including novel developments in drug delivery systems, cellular targeting and intracellular delivery, pharmaceutical microbiology and biotechnology, formulation technologies, pharmaceutical product development and manufacturing, advanced drug delivery systems, vaccine design and drug delivery technology, pharmacovigilance and drug safety, pharmacogenomics, therapeutic drug carrier systems, regulatory affairs and intellectual property rights, nanotechnology in pharmaceutics and drug delivery systems, clinical and medical case reports, pharmaceutical analysis, and personalized and precision medicine.

I hope you will enjoy this hybrid event, and you will receive an outstanding experience.

Consolato M. SERGI
Universities of Alberta and Ottawa, Canada



Welcome Message

Dear Conference Attendees,

It is an honor and great pleasure to write a few welcome notes for the session entitled “Novel Developments in Drug Delivery Systems”. Over the past two decades, drug delivery systems have evolved far beyond conventional tablets and parenteral injections, and research in this field is progressing and still expanding at a rapid pace. Presentations at this conference will provide exciting updates and representative examples illustrating the diverse topics that shape this field of research, such as personalized medicine, nanomedicine techniques, delivery matrices, controlled drug release, mathematical modelling, a variety of delivery routes, and more. They represent a great opportunity for scientists and clinicians of all career stages to gain insight into the vast breadth of this field and its immediate and longer-term implications for the improved treatment of human diseases.

Axel H. Schönthal

Keck School of Medicine, University of Southern California, U.S.A.

ABOUT
MAGNUS GROUP

Magnus Group, a distinguished scientific event organizer, has been at the forefront of fostering knowledge exchange and collaboration since its inception in 2015. With a steadfast commitment to the ethos of Share, receive, grow, Magnus Group has successfully organized over 200 conferences spanning diverse fields, including Healthcare, Medical, Pharmaceutics, Chemistry, Nursing, Agriculture, and Plant Sciences.

The core philosophy of Magnus Group revolves around creating dynamic platforms that facilitate the exchange of cutting-edge research, insights, and innovations within the global scientific community. By bringing together experts, scholars, and professionals from various disciplines, Magnus Group cultivates an environment conducive to intellectual discourse, networking, and interdisciplinary collaboration.

Magnus Group's unwavering dedication to organizing impactful scientific events has positioned it as a key player in the global scientific community. By adhering to the motto of Share, receive, grow, Magnus Group continues to contribute significantly to the advancement of knowledge and the development of innovative solutions in various scientific domains.

ABOUT
PDDS 2025

We are pleased to welcome you to the **12th Edition of the Global Conference on Pharmaceutics and Novel Drug Delivery Systems (PDDS 2025)**, taking place in **Valencia, Spain**, and **virtually** from **September 11–13, 2025**. This hybrid event unites pharmaceutical scientists, researchers, industry leaders, and healthcare innovators from across the globe to explore transformative developments in drug formulation, delivery, and therapeutics. Centered around the theme ***"Pioneering Pharmaceutics: From Discovery to Delivery,"*** the conference emphasizes the full continuum of pharmaceutical innovation from molecular discovery to patient-centered delivery solutions.

This abstract book reflects the scientific core of **PDDS 2025,** showcasing a broad spectrum of research in areas such as targeted drug delivery systems, nanomedicine, biopharmaceuticals, vaccine technologies, pharmaceutical engineering, and regulatory science. The featured studies highlight the dedication of the global research community to advancing precision medicine, enhancing therapeutic efficacy, and overcoming delivery challenges through interdisciplinary collaboration and cutting-edge science.

We hope this gathering will not only inform but also inspire. As you engage with the abstracts and participate in the sessions whether in person or online, may you uncover fresh insights, ignite new research ideas, and forge meaningful professional connections. Your presence strengthens our shared mission to reshape the future of drug development and improve global health outcomes.

ABOUT

CPD Accreditation

Continuing Professional Development (CPD) credits are valuable for PDDS 2025 attendees as they provide recognition and validation of their ongoing learning and professional development. The number of CPD credits that can be earned is typically based on the number of sessions attended. You have an opportunity to avail 1 CPD credit for each hour of Attendance.

Some benefits of CPD credits include:

Career advancement: CPD credits demonstrate a commitment to ongoing learning and professional development, which can enhance one's reputation and increase chances of career advancement.

Maintenance of professional credentials: Many professions require a minimum number of CPD credits to maintain their certification or license.

Increased knowledge: Attending PDDS 2025 and earning CPD credits can help attendees stay current with the latest developments and advancements in their field.

Networking opportunities: Pharmaceutics Conference provide opportunities for attendees to network with peers and experts, expanding their professional network and building relationships with potential collaborators.

Note: Each conference attendee will receive 26+ CPD credits.

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12th Edition of Global Conference on

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SEPTEMBER

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KEYNOTE PRESENTATIONS

Andreas M Papas PhD

Adjunct Professor of the College of Medicine, East Tennessee State University, United States

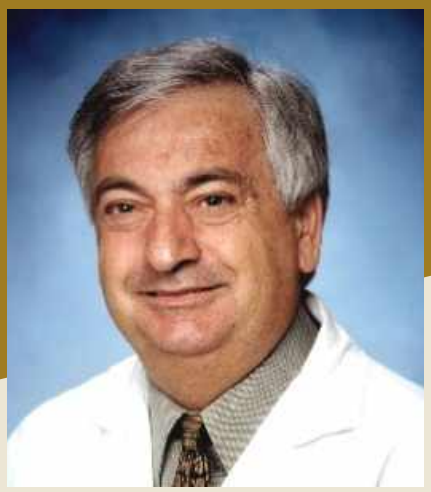
CEO, Antares Health Products Inc. , United States

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.

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 developed product concepts and managed formulation, clinical evaluation supported by the National Institutes of Health and the Cystic Fibrosis Foundation, stability and safety testing, pilot, and commercial production.

- 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.
- The applications of vitamin E TPGS in solubility, stability and enhanced absorption and bioavailability of lipophilic nutraceuticals and natural extracts including cannabinoids. The presentation will include applications in pharmaceuticals, veterinary, food, dietary supplements, and personal care.

Axel H. Schönthal[1*], Clovis O. da Fonseca[2], Thomas C. Chen[3,4]

[1]Department of Molecular Microbiology & Immunology, Keck School of Medicine, University of Southern California, Los Angeles, California, United States

[2]Department of Neurological Surgery, Federal Hospital of Ipanema, Rio de Janeiro, Brazil

[3]Department or Neurological Surgery, Keck School of Medicine, University of Southern California, Los Angeles, California, United States

[4]NeOnc Technologies, Inc., Los Angeles, California, United States

Development of novel drug delivery pathways enabled by perillyl alcohol (NEO100), a monoterpene with multifaceted biomedical applications

Perillyl alcohol is a naturally occurring monoterpene related to limonene. We have synthesized a clinical-grade version, called NEO100 (NeOnc Technologies, Inc., Los Angeles, California), which has revealed a variety of highly promising characteristics that we are exploring toward the development of improved cancer-therapeutic regimens. (i) NEO100 can be delivered via intranasal applications, which exploits direct nose-to-brain transport, and an ongoing Phase 2a clinical trial with recurrent malignant glioma patients is generating intriguingly positive results. (ii) In preclinical brain cancer models, we have shown that intranasal NEO100 can act as a carrier to enable nose-to-brain delivery of other cancer drugs directly to the malignant lesions in the brain. (iii) When given via intra-arterial injection, NEO100 was shown to safely and reversibly open the Blood-Brain Barrier (BBB) of mice, which enabled other cancer drugs circulating in

Biography

Axel H. Schönthal, PhD, is Associate Professor in the Department of Molecular Microbiology and Immunology at the Keck School of Medicine of the University of Southern California (USC) in Los Angeles. He is also Associate Dean for Biomedical Masters Programs, and Faculty Fellow of the USC Center of Excellence in Teaching. Before joining USC, he had obtained his PhD from the University of Karlsruhe, Germany, followed by a postdoctoral stay at the Cancer Center of the University of California in San Diego (UCSD), California. At USC, he pursues the development of novel anticancer agents and novel delivery methods to improve cancer therapeutic efficacy. As of 2025, he has authored over 200 scholarly articles and chapters with an H-Index of 54.

the bloodstream to effectively enter the brain and kill brain cancer cells; in the absence of NEO100, these drugs were unable to cross the BBB and did not exert brain-targeted activity. (iv) In further applications, we covalently conjugated NEO100 to other, already established drugs. For example, conjugation of NEO100 to temozolomide, an alkylating agent, resulted in a novel fusion compound called NEO212 (NeOnc Technologies). Our studies in diverse preclinical tumor models established that NEO212 is well-tolerated and highly effective against different cancer types, and a Phase I clinical trial has begun. This talk will provide an overview of the multifaceted applications of NEO100 toward the development of more effective cancer treatments.

Prof. Dr. Habil Bernd Blobel, FACMI, FACHI, FHL7, FEFMI, FIAHSI

Medical Faculty, University of Regensburg, Regensburg, Bavaria, Germany

First Medical Faculty, Charles University Prague, Staré Město, Czech Republic

Faculty European Campus Rottal-Inn, Deggendorf Institute of Technology, Deggendorf, Bavaria, Germany

Department of Informatics, Bioengineering, Robotics and System Engineering, University of Genoa, Genoa, Italy

Managing healthcare transformation towards personalized, preventive, predictive, participative precision medicine ecosystems

For realizing pervasive and ubiquitous health and social care services, health and social care system have to undergo an organizational, methodological and technological transformation towards personalized, participative, preventive, predictive precision medicine. For designing and managing the resulting highly complex, distributed and dynamic ecosystem, we must consistently and formally represent the system and its components from the perspective of all actors from different domains including the subject of care, using different methodologies, knowledge, language and experiences. The granularity level of the considered components may range from elementary particles up to the society and universe. This must be done, using a system-theoretical, architecture-centered, ontology-based and policy-driven approach. Over the last 30 years, the author developed the necessary model and framework, which is meanwhile standardized as ISO 23903 interoperability and integration reference architecture. The approach has been defined

Biography

Dr. Bernd Blobel studied Mathematics, Technical Cybernetics and Electronics, Bio-Cybernetics, Physics, Medicine and Informatics at the University of Magdeburg and other universities in the former GDR. He received his PhD in Physics with a neurophysiological study. Furthermore, he performed the Habilitation (qualification as university professor) in Medicine and Informatics. Dr. Bernd Blobel was Head of the Institute for Biometrics and Medical Informatics at the University of Magdeburg, and thereafter Head of the Health Telematics Project Group at the Fraunhofer IIS in Erlangen. Thereafter, he acted until his retirement as Head of the German National eHealth Competence Center at the University of Regensburg as well as Head of the globally unique International Interdisciplinary PhD and PostDoc College. Dr. Bernd Blobel was and is still leadingly involved in many countries health digitalization as well as electronic health record strategy. Has, published more than 600 papers, published/edited many books and supervised a big number of PhD students from all around the world. Dr. Bernd Blobel was German

as mandatory for any specification or project at ISO, CEN, IEEE, etc. addressing more than one domain. The presented approach enables design, implementation and management of intelligent and ethical health and social care systems as well as knowledge-based communication and cooperation of all actors involved. Thereby, it manages also security, privacy and trust in detail. The keynote introduces necessary standards and methodologies for designing and managing 5P medicine ecosystems as well as practical examples.

Representative to many SDOs such as HL7, ISO, CEN, OMG, IEEE, ASTM, SNOMED, etc., also chairing the national mirror groups. Furthermore, he still engaged in international higher education. Dr. Bernd Blobel is Fellow of several international academies.

Dr. Bhupendra Prajapati*, Shalin Parikh

Department of Pharmaceutics, Shree S. K. Patel College of Pharmaceutical Education and Research, Ganpat University, Mehsana, Gujarat, India

Abuse-deterrent dosage form technique utilizing a fusion of innovative pharmaceuticals and ion exchange resin

Prescribed drug abuse denotes the potential misuse of pharmacological formulations. Many regulatory agencies are working to improve rules for current and future drug formulations by using some level of abuse deterrent technologies. Opioids are often and widely misused substances because of their prevalent availability on the market. Prevalent abuse tactics encompass the use of excessive pills or modification of dose types. Regulatory bodies mandate that dosage forms have mechanisms to inhibit these techniques. The physical and chemical alterations include several methods, such as pulverization, inhalation, chemical extraction, and syringe delivery. A self-regulating pharmaceutical dosage form was developed using an ion exchange resin and Tapentadol HCl as a model drug. The formulation was developed by integrating a medication with an ion exchange resin complex and other excipients. This approach produces a robust dose form that withstands many physical and chemical methods employed in drug misuse. The final product underwent water extraction at both standard and elevated temperatures (exceeding 90°C) to evaluate its extraction efficacy. The compressive strength of the combination was validated using both a domestic coffee grinder and a laboratory mortar and pestle. The gelation characteristic of Polyox inhibited the solution's potential for intravenous abuse. The formulation was evaluated using an in vitro dissolution study, as specified in the advice for industry issued by the US Food and Drug Administration

Biography

Dr. Bhupendra Gopalbhai Prajapati is a Professor in the Department of Pharmaceutics at Shree S.K. Patel College of Pharmaceutical Education and Research, Ganpat University, Gujarat, India. Dr. Prajapati is also acting as Adjunct Professor at Department of Industrial Pharmacy, Faculty of Pharmacy, Silpakorn University, 73000, Nakhon Pathom, Thailand. With over 22 years of experience in academia, research, and industry, he specializes in lipid-based formulations, nano/microparticulate drug delivery, and bioavailability enhancement. A recipient of several prestigious awards, including the AICTE Young Teacher Award and Ganpat University's Staff Excellence honors. Dr. Prajapati has published over 320 research/review papers and has contributed to more than 150 book chapters. He actively mentors Ph.D. and PG scholars and serves as editor or section editor for several international publications in pharmaceutical sciences.

(FDA). The study compared the dissolution of a single capsule to that of many capsules (more than four) to validate the abuse-resistant properties of the drug-ion exchange resin-based formulation.

Consolato M Sergi [1,2*], Mohit Kehar[3], Carolina Jimenez-Rivera[3]

[1]Division of Anatomic Pathology, Children's Hospital of Eastern Ontario, University of Ottawa, 401 Smyth Road Ottawa, Ottawa, ON, K1H 8L1, Canada

[2]Department of Laboratory Medicine and Pathology, Stollery Children's Hospital, University of Alberta Hospital, Edmonton, AB, T6G 2B7, Canada

[3]Division of Gastroenterology, Hepatology and Nutrition, Children's Hospital of Eastern Ontario, University of Ottawa, Ottawa, ON, Canada

Medical liver biopsy: Toward a personalized approach

Introduction: Metabolic-(Non-alcoholic) Associated Fatty Liver Disease (MAFLD/NAFLD) has increasingly become a worldwide epidemic. It has been suggested that renaming NAFLD to MAFLD is critical in identifying patients with advanced fibrosis and poor cardiovascular outcomes. There are concerns that the progression to Non-Alcoholic Steatohepatitis (NASH) may become a constant drive in the future healthcare of children and adolescents. There is a necessity to tackle the emerging risk factors for NASH-associated Hepatocellular Carcinoma (HCC).

Methods: We carried out a systematic review study using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) parameters involving a literature search of academic databases (PubMed, Scopus, Medline, Google Scholar, and Cochrane Database, 2011– 2023) targeting specifically the handling of liver biopsies for MAFLD/NAFLD. Data were extracted

Biography

Consolato M. Sergi is the Chief of the Anatomic Pathology Division at the Children's Hospital of Eastern Ontario, Professor of Pediatrics and Pathology, University of Alberta and Ottawa, Canada. Dr. Sergi is Canadian, born in Rome (Italy), obtained his MD degree with honors, qualification in Pediatrics, and Pediatric Pathology Fellowship at the University of Genoa, Italy. Dr. Sergi obtained his qualification in Pathology at the Ruprecht Karl University of Heidelberg, Germany, the Clinical Reader title at the University of Bristol, UK, PhD/ Habilitation at the University of Innsbruck, Austria, MPH in Austria, and FRCPC (Pathology) from the Royal College of Physicians and Surgeons of Canada. In his research, he established his Canadian laboratory in August 2008. Dr. Sergi welcomed more than 100 graduate MSc/Ph.D, students, fellows, undergraduate and summer students with on-going teaching in Genetics and Pathology. Dr. Sergi is a Consultant of Carcinogenesis in Experimental Animals at the WHO/IARC, Lyon, France, and an "ad-hoc" Peer-Referee for the National Toxicology Program, NIH, USA. His areas of

and used to determine the current children's hospital of Eastern Ontario grossing protocol.

Results: The studies show the ability to detect MAFLD/NAFLD in liver biopsies with accuracy by implementing oil red O staining and preserving the rest of the frozen tissue for studies involving Single Nucleotide Polymorphisms (SNPs). Here, we present the current protocol of liver biopsy separated between pre-analytical, analytical, and post-analytical handling. Genetic association investigations have identified single nucleotide polymorphisms implicated in the progression of MAFLD-HCC, many of which seem to belong to the lipid metabolism pathways. PNPLA3 rs738409 variant, TM6SF2 rs58542926 variant, MBOAT7 rs641738 variant, and GCKR variants seem to be significantly associated with NAFLD disease susceptibility.

Conclusions: A thorough examination of the liver biopsy in MAFLD/NAFLD is critical for the management of patients with this disease. Grossing of the liver biopsy is key to identifying histologic, immunophenotypical, and ultrastructure data and properly preserving tissue for molecular genomics data, specifically for SNPs identification.

interest are Biology and Pathology of the Cardiovascular/Gastrointestinal System and Gut/Bile Microbiome as well as Bone Cell Biology. Dr. Sergi has>300 peer-reviewed PubMed publications (h-index: 23, RG-score: 44.26, >2,500 citations). Dr. Sergi identified the role of apoptosis in the ductal plate malformation of the liver (Am J Pathol, 2000), a new CTL4/Neu1 gene fusion transcript in sialidosis (Hum Genet 2001, FEBS Lett 2002, J Med Genet 2003), two new genes, i.e., WDR62, which encodes a centrosome-associated protein (Nat Genet 2010) and OTX2, mutations of which contribute to dysgnathia (J Med Genet 2012), as well as characteristics of the bile microbiome (Infect Drug Resist 2019, HPB (Oxford) 2019, J Med Microbiol 2018, Eur J Clin Microbiol Infect Dis, 2018). Dr. Sergi is editor in chief and in the editorial board of prestigious medical journals and international agencies.

Luis Jesús Villarreal Gómez[1*], Daniela Alejandra Hernández Hernández[1], Sergio Origel Lucio[2], Graciela Lizeth Pérez González[1], Lucia Margarita Valenzuela Salas[3], Yoxkin Martínez Estevez[4]

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Design and evaluation of exo-ITC: A bilayer fibrous system for controlled exosome delivery in dermatological applications

This research explores the creation of a novel exosome delivery platform, termed exo-ITC, tailored for use in dermatology. Exosomes, as extracellular vesicles, are pivotal in intercellular communication and exhibit substantial therapeutic potential in regenerative medicine and dermatological treatments. The study aims to fabricate a bilayer fibrous system capable of controlled exosome loading and release, enhancing collagen production

Biography

Dr. Luis Villarreal is a research professor at the Faculty of Engineering Sciences and Technology, Autonomous University of Baja California, Tijuana, Baja California, Mexico, member of the National System of Researchers SNII-CONAHCyT Level 2, and a member of the academic body Applied Bioengineering "In Consolidation". To date. Dr. Villarreal has published 51 indexed articles, with a total of 1,134 citations in Scopus. Currently, Research and Graduate Coordinator of the Faculty, General Coordinator of MyDAUD-Multicampus. Dr. Luis has participated in more than 70 national and international conferences. Founder and Editor-in-Chief of the Revista de Ciencias Tecnológicas (RECIT) (only 5 official ones at UABC), organizing president of the main international conferences of the Faculty FCITEC and member of the editorial committee of important publishers such as Bentham, MDPI, Hindawi, Wiley. Dr. Luis is a member of the editorial advisory board of the journal “Current Drug Delivery” and a referee for more than 210 articles participating in publishers such as Elsevier, Wiley, Springer, MDPI and Hindawi among others. Also, participates as an evaluator

and skin regeneration. The system is developed using electrospinning techniques, integrating exosomes into a bilayer fibrous structure. Comprehensive characterization is conducted, including morphological analysis (scanning electron microscopy), particle size distribution (dynamic light scattering), stability (thermogravimetric analysis), and exosome release efficiency. The findings offer critical insights into the feasibility and therapeutic potential of the exo-ITC system for skin care applications. This innovative system is expected to address various dermatological conditions, utilizing the regenerative and therapeutic properties of exosomes. Overall, this research marks a significant step forward in advancing topical therapies for skin health and regeneration.

of research projects for funding in Mexico, Italy, Malaysia and Peru. Dr. Luis has contributed to the generation of human resources with 10 undergraduate theses, 10 master's theses and 5 doctoral theses. His research lines in the area of Biomaterials are in Tissue Engineering, Drug Release Systems and Biotechnology, among others. The improvement in the treatment of infants is his primary objective.

Madhav Bhatia
Department of Pathology and Biomedical Science, University of Otago, Christchurch, New Zealand

Search for novel biomarkers and therapeutic targets for inflammatory disease

Hydrogen sulfide is a toxic gas, which is an environmental and industrial pollutant. In recent years, however, it has been shown that this gas is also synthesized in the body, and acts as a potent vasodilator. Substance P is an 11 amino acid neuropeptide from the tachykinin family, and acts as a mediator of pain. We have shown that hydrogen sulfide and substance P act as mediators of inflammation in different disease conditions, such as acute pancreatitis, sepsis, and severe burn injuries. Acute pancreatitis, sepsis, and severe burn injuries are all major health problems, in which systemic inflammatory response syndrome can lead to multiple organ dysfunction syndrome and death. Based on pre-clinical studies with *in vivo* experimental models of disease, we now have a good understanding of the contribution of hydrogen sulfide and substance P to inflammation. We have recently shown a key role of hydrogen sulfide and substance P in clinical inflammatory diseases, demonstrating the translational potential of our pre-clinical research. For example, hydrogen sulfide and substance P can serve as novel biomarkers for sepsis. These studies can lead to the development of novel therapeutic approaches for several clinical conditions, which are major health problems. Our early research has shown that this knowledge can be taken from the bench to the bedside.

Biography

Madhav Bhatia is a world-renowned expert in the area of inflammation. Research in his laboratory has shown hydrogen sulfide and substance P as mediators of inflammation and potential therapeutic targets for inflammatory diseases such as acute pancreatitis, sepsis, burn injuries, and joint inflammation. Madhav Bhatia has received numerous grants, has authored more than 200 contributions to the peer-reviewed literature, given several invited presentations in different countries and is on Editorial Boards of 46 journals. His publications have been cited more than 21000 times, and he has an "h"-index of 74.

Gamberini M.C

Department of Life Sciences, University of Modena and Reggio Emilia, via G. Campi 103, Modena, 41125, Italy

Analytical strategies for solid-state forms in drug development

The solid-state characterization of pharmaceutical compounds plays a pivotal role in understanding and controlling the physical and chemical properties of Active Pharmaceutical Ingredients (APIs) and excipients. This work presents an integrated overview of analytical techniques applied to solid-state forms, including polymorphs, hydrates, solvates, and amorphous systems. Key methods such as Powder X-Ray Diffraction (PXRD), Differential Scanning Calorimetry (DSC), Thermogravimetric Analysis (TGA), and vibrational spectroscopy (FT-IR, Raman, and hot-stage Raman) are discussed for their diagnostic value in identifying crystal structures, phase transitions, and dehydration/solvation processes. Surface-Enhanced Raman Spectroscopy [SERS]) are explored for their potential in elucidating molecular packing, surface morphology, and solid-solid transitions. The combination of these tools provides a robust analytical platform for form selection and stability assessment. Selected case studies—such as the polymorphic forms of chloramphenicol palmitate, hydration states of ampicillin, and thermal behavior of tamoxifen citrate—demonstrate the practical application of multitechnique approaches. Emphasis is placed on the importance of coupling conventional characterization with chemo metric and predictive modeling strategies to meet regulatory requirements and enhance the reliability of solid-state analysis in drug development.

Keywords: *Solid-State Characterization, Polymorphism, Raman Spectroscopy, Thermal Analysis, Pharmaceutical Compounds.*

Biography

Maria Cristina Gamberini has a degree in Chemistry, her first period abroad at the Polytechnic of Lausanne has been dedicated to the study of nanomaterials using spectroscopic techniques. She is professor at the University of Modena and Reggio Emilia in the Medicinal Analysis Laboratory for the degree course in Chemistry and Pharmaceutical Technologies. She has published more than 66 articles H-Index 23 in SCI(E) journals.

Huiqin Yang
ICON Clinical Research Ltd, United Kingdom

Precision oncology and personalised medicine: Innovative technology for the treatment of colorectal cancer

Precision oncology plays an essential role for the treatment of solid cancers. Colorectal cancer has emerged as a disease condition where abnormal genetic mutations occur in a group of colorectal cancer patients. Patients with advanced colorectal cancers are often associated with poor survival. Optimising treatment is the major goal for the treatment of advanced colorectal cancer, which can improve overall survival, progression-free survival and patients' health-related quality of life. Many studies have been conducted to develop innovative technologies of treatment regimens tailored to the mutation profile of individual cancers, with the goal of improving overall health outcomes of patients. This talk will discuss precision medicine in the research domain of colorectal cancer and the effectiveness of innovative technologies for the treatment of advanced colorectal cancer.

Biography

Dr Huiqin Yang is Senior Research Fellow in Health Technology Assessment and Deputy Director of the Peninsula Technology Assessment Group (PenTAG) at the University of Exeter, UK. She has over 13 years research experience in Health Services Research and she has undertaken a range of Health Technology Assessment (HTA) projects for the National Institute for Health and Clinical Excellence (NICE) and the National Institute for Health Research (NIHR) HTA Programme within a wide range of areas. She has PhD in Medical Decision Making from the University of York and she is an Associate Editor of BMC Health Services Research.

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

Macitentan/tadalafil combination – An additional value in pharmacotherapy of pulmonary arterial hypertension

Pulmonary Arterial Hypertension (PAH) remains a devastating disease with high morbidity and mortality. It is uncommon, progressive and life-threatening blood vessel disorder differentiated by the constriction of minor pulmonary arteries and elevated blood pressure in the pulmonary circulation that in the end leads to right heart failure. The European Society of Cardiology / European Respiratory Society clinical guidelines recommend initial combination therapy of an endothelin receptor antagonist and a PDE5 inhibitor for patients with idiopathic PAH, heritable drug-associated PAH, or PAH-associated with connective tissue disease without cardiopulmonary comorbidities at low or intermediate risk. Since disease progresses rapidly for many patients, and frequently accompanied with serious clinical presentation, new pharmacological options continue to be needed. The new FDA-approved single-tablet combination of macitentan, an endothelin receptor antagonist, and tadalafil, a Phosphodiesterase 5 (PDE5) inhibitor, is indicated for chronic treatment of PAH (WHO Group I) in adult patients of WHO Functional Class (FC) II-III. Individually, macitentan reduces the risk of clinical worsening events and hospitalization, and tadalafil improves exercise ability. It was suggested that this drug may offer a patient-friendly approach to support initial combination therapy and rapid escalation for the appropriate patients. In light of previous facts, the main objectives of this presentation will be to clarify the pharmacological properties of macitentan/tadalafil combination, including pharmacodynamics,

Biography

Miroslav Radenković, 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; COST Action; as well as the NIH Fogarty International Center Project, USA. Dr. Radenković is a member of the Ethics Board of Serbia and a Chair Department.

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 additional drug for PAH, consequently helping clinicians in its suitable prescribing and adequate clinical use.

Suresh P.K.
Professor Higher Academic Grade, School of Biosciences & Technology, Department of Biomedical Sciences, VIT, Vellore, Tamil Nadu, India

In silico analysis for the screening and selection of repurposed drugs and mitochondrial targets for drug development and delivery for OSCC therapy

Globally, Oral Squamous Cell Cancer(OSCC) is a significant public health burden in terms of health care costs as well as lost man-hours and school-hours. This form of neoplasia ranks 3rd both in terms of the number of cancers as well as in terms of the mortality data. Further, it is the most common form of cancer in males in India. Despite variations in the statistics, the 5-year survival rate continues to be around 50%. One of the major determinants attributed to chemo and radio-resistance and relapse is the presence of cancer stem cells with alterations in bioenergetic features in these cells and changes in mitochondrial functions - In terms of mitochondrial dynamics, deregulation in their biogenesis (fusion and fission mechanisms) as well as mitophagy (removal of damaged mitochondria)-related processes are considered to be hallmark features of CSCs. Hence, since inhibition of mitophagy as well as mitochondrial biogenesis can possibly eradicate cancer stem cells by cell death mechanisms, we identified key proteins involved in mitochondrial dynamics including mitophagy and apoptosis (based on an extensive literature search). Among the available OSCC anti-cancer drug treatment options, drug repurposing is considered to be a feasible, cost-effective and less time-consuming approach for developing efficacious and safe drugs targeting this human neoplastic condition.

Biography

Dr. P.K. Suresh is a Professor Higher Academic Grade, Department of Biomedical Sciences, School of Biosciences & Technology, VIT, Vellore. He doctoral degree and post-doctoral training was from the USA. His research interests are in drug development and delivery systems as well as in anticancer and wound healing models, apart from in-silico analysis. Dr. Suresh has teaching and research experience of about 24 and a half years post-Ph.D. He has been a course instructor in papers related to Biomedical Science and related technologies. Dr. Suresh has published 74 papers (including book chapters) in peer-reviewed journals with over 1000 cumulative citations.

Since it is known than OSCC patients have opportunistic fungal infections, which can contribute to inflammation and oral neoplasia, it was decided to screen anti-fungal drugs (125 ligands) using a combination of ligand profiling (PUBCHEM, Lipinsky's rule of 5, SWISS-ADME and Pro-Tox3), molecular docking (AUTODOCK VINA, AUTODOCK). This in silico analysis was supplemented by performing MDS and MM-PBSA studies to further verify the nature of the binding over a 100 ns time period. Based on our defined in silico experimental flow, we observed that targeting DRP1 with itraconazole may possibly yield superior binding and stability, in comparison with our results obtained for all of the other ligand-target combinations. While these results provide an opportunity to develop this molecule further (synthesis, characterization and *in vitro* cell line-based testing of a novel liposome-based nano-formulation), these positive findings have led us to extend us *in-silico* work by refining our findings as well as comparing these results with other categories of repurposed drugs specifically targeting our selected mitochondria-centric proteins. Finally, keeping in mind the pivotal role played by mitochondria in terms of the therapeutic aspects and circumventing resistance, selection of the appropriate repurposed drug/drug combinations can pave the way for the development and/or refinement of liposome-based delivery strategies for the selective targeting of this organelle in OSCC cells.

Paulo C. De Morais

Genomic Sciences and Biotechnology, Catholic University of Brasilia, Brasilia, DF, Brazil

Institute of Physics, University of Brasilia, Brasilia, DF, Brazil

Mathematical modeling the disc diffusion test: Antibacterial activity of copper-doped SnO_2

In this keynote talk, the traditional disc diffusion-test bioassay is revisited within the perspective of using a mathematical approach grounded on the standard as well as on the modified Hill model. Importantly, the Hill model was established in 1910 to account for the binding of oxygen molecules to hemoglobin and since then has been used as a standard model for evaluation of a wide plethora of experimental situations, including cell viability assays. As for the challenging material, Cu-doped tin oxide (SnO2) spherical nanoparticles (mean size 8.3 nm) will be tested against two bacteria cultures, namely the gram positive *Staphylococcus aureus* (S. aureus) and the gram negative *Escherichia coli* (E. coli). Although limited in terms of variety of challenging materials and bacteria cultures, the success of the proposed mathematical approach while explaining the experimental data is quite impressive. The outcomes of the present analysis point quite favorably toward the general use of it in the very near future. New concepts, such as the biological size and the biological size dispersity, for instance, will emerge naturally from the data analysis reported in the talk.

Biography

Professor Paulo Cesar De Morais (H60), PhD, full Professor of Physics at the University of Brasilia (UnB)–Brazil up to 2013. Appointed as UnB's (Brazil) Emeritus Professor (2014); Visiting Professor at the Huazhong University of Science and Technology (HUST)–China (2012-2015); Distinguished Professor at the Anhui University (AHU)–China (2016-2019); Full Professor at the Catholic University of Brasília–Brazil (2018); 2007 Master Research Prize from UnB. Paulo held two-years (1987-1988) position with Bell Communications Research, New Jersey–USA. Doctoral degree in Solid State Physics (1986) from the Federal University of Minas Gerais – Brazil. With more than 12,000 citations, He has published about 500 papers (Web of Science), delivered more than 200 international talks, and filed more than 15 patents.

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

Understanding drug transport in plasma: The role of protein binding

Understanding drug transport in plasma is pivotal to optimizing therapeutic outcomes, as it governs drug distribution, efficacy, and clearance. A key factor in this process is protein binding, where drugs reversibly interact with plasma proteins such as albumin and alpha-1-acid glycoprotein. These interactions regulate the free (unbound) drug fraction, which directly correlates with pharmacological activity. Highly bound drugs exhibit restricted tissue distribution and slower clearance, while those with low binding are more freely available for metabolism and excretion. Protein binding is dynamic, influenced by factors such as endogenous compounds, and drug-drug interactions, often leading to variability in clinical responses. Advances in analytical methods and computational modeling now offer deeper insights into the mechanisms underlying these interactions, enabling improved prediction of pharmacokinetic behaviors and drug efficacy. This study focuses on elucidating the interactions between a range of drug molecules and albumin, the principal transport protein in plasma, through the combined application of computational modeling and spectroscopic techniques.

Biography

Dr. Saad Tayyab studied Biochemistry at Aligarh Muslim University, India, completing Masters and Ph.D. degrees in 1981 and 1987, respectively. He is currently working as a Professor of Pharmaceutical Chemistry at UCSI University, Kuala Lumpur, Malaysia. Before joining UCSI University. Dr. Saad served at Universiti Malaya (2004-2018), Haramaya University, Ethiopia (2001-2004), Aligarh Muslim University, India (1988-2001), and the University of Kashmir, India (1987-1988). He was admitted as a Fellow, Royal Society of Chemistry, UK, in 2017, Fellow, Royal Society of Biology, UK, in 2019, Member, American Chemical Society in 2020, and Member, Sigma Xi in 2024. He is serving as an Editorial Board member for several journals. Has published over 150 journal papers, 17 popular articles, 1 book, 2 book chapters, and 1 learning aid. Several research students (16 Ph.D., 6 M.Phil., 1 M.D., and 13 M.Sc.) completed their degrees under his supervision, and guided 32 undergraduate projects. His research interests include drug-protein interaction, protein folding, protein/enzyme stability, and protein structure-function. Dr. Saad possesses an h-index of 27, and his name is included in the reviewers' lists of many international journals.

Sergey Suchkov[1-14*], Hiroyuki Abe[6,15], Holland Cheng[16]

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Brussels, EU

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Dundee, Scotland

[9]ACS (American Chemical Society), Washington, DC, USA

[10]AHA (American Heart Association), Dallas, TX, USA

[11]ARVO (The Association in Research in Vision & Ophthalmology), Rockville, MD, USA

[12]ISER (International Society for Eye Research), Anchorage, AK USA

[13]Secretary General, United Cultural Convention (UCC), Cambridge, UK

[14]The Russian Academy of Natural Sciences, Moscow, Russia

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Personalized and Precision Medicine (PPM) as a unique healthcare model through design-inspired biotech & biopharma-driven applications and upgraded business marketing to secure the human healthcare and biosafety

Traditionally, a disease has been defined by its clinical presentation and observable characteristics, not by the

Biography

Sergey Suchkov was born in the city of Astrakhan, Russia, in a family of dynasty medical doctors. In 1980, graduated from Astrakhan State Medical University and was awarded with MD. In 1985, Suchkov maintained his PhD as a PhD student of the I.M. Sechenov Moscow Medical Academy and Institute of Medical Enzymology. In 2001, Suchkov maintained his Doctor Degree at the National Institute of Immunology, Russia. From 1989 through 1995. Dr Suchkov was being a Head of the Lab of Clinical Immunology, Helmholtz Eye Research Institute in Moscow. From 1995 through 2004- A Chair of the Dept for Clinical Immunology, Moscow Clinical Research Institute (MONI-KI). In 1993-1996. Dr Suchkov was a Secretary-in-Chief of the Editorial Board, Biomedical Science, an internation-al journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK. At present, Dr Sergey Suchkov, MD, PhD, is: Director for Center of Biodesign of N.D. Zelinskii Institute for Organic Chemistry of the Russian Academy of Sciences, Moscow, Russia. Senior Scientific Advisor of China

underlying molecular mechanisms, pathways and systems biology-related processes specific to a particular patient (ignoring persons-at-risk). A new systems approach to subclinical and/or diseased states and wellness resulted in a new trend in the healthcare services, namely, Personalized and Precision Medicine (PPM).

Despite breakthroughs in research that have led to an increased understanding of PPM-based human disease, the translation of discoveries into therapies for patients has not kept pace with medical need. It would be extremely useful to integrate data harvesting from different databanks for applications such as prediction and personalization of further treatment to thus provide more tailored measures for the patients and persons-at-risk resulting in im-proved outcomes and more cost effective use of the latest health care resources including diagnostic (companion ones), preventive and therapeutic (targeted molecular and cellular) etc.

Translational researchers, bio-designers and manufacturers are beginning to realize the promise of PPM, translating to direct benefit to clinical practice. For instance, companion diagnostics tools, theranosticums, molecular imaging and targeted therapies represent important stakes for the biopharma in terms of market access, of return on investment and of image among the prescribers. So developing the next-generation medicines and diagnostic tools requires changes to traditional clinical trial designs that result in new types of data. Making the best use of those innovations and being ready to demonstrate results for regulatory bodies requires specialized knowledge that many clinical development teams do not have.

Healthcare is undergoing a transformation, and it is imperative to leverage new technologies to support the advent of PPM. And it is urgently needed to discover, to develop and to create new (targeted and/or smart/intelligent) drugs. And with the support of nanotechnology, new targeted therapeutic agents and biomaterials, or aid the development of assays for disease biomarkers and identification of potential biomarker-target-ligand (drug) tandems to be used for the targeting, PPM is making phenomenal steps in the future to come. This is the reason for developing global scientific, clinical, social,

Hong Kong Innovation International Business Association, Hong Kong. R&D Director of InMedStar, Russia Member of the: Russian Academy of Natural Sciences, Moscow, Russia, New York Academy of Sciences, USA, American Chemical Society (ACS), USA, American Heart Association (AHA), USA, European Association for Medical Education (AMEE), Dundee, UK, EPMA (European Association for Predictive, Preventive and Personalized Medicine), Brussels, EU, ARVO (American Association for Research in Vision and Ophthalmology), ISER (International So-ciety for Eye Research), Personalized Medicine Coalition (PMC), Washington, DC, USA.

and educational projects in the area of PPM and design-driven translational medicine to elicit the content of the new trend. The latter would provide a unique platform for dialogue and collaboration among thought leaders and stakeholders in government, academia, industry, foundations, with an interest in improving the system of healthcare delivery on one hand and drug discovery, development, and translation, on the other one, whilst educating the policy community about issues where biomedical science and policy intersect. So, the grand change and challenge to secure our health and wellness are rooted not in medicine, and not even in science! Just imagine Where?! In the upgraded Hi-tech culture!

Keywords: Personalized & Precision Medicine, Biomarkers, Targets, Nanoparticles, Nanocarriers, Nanotheranostics, Nanobiomedicine, Nanotechnologies

Stephen Hsu[1,2*], Douglas Dickinson[2]

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[2]Camellix, LLC. Augusta University Life Sciences Business Development Center, Augusta, GA, USA

Fast nanotechnology: A novel platform for drug development and beyond

The bioavailability crisis remains a major bottleneck in drug development, particularly for hydrophobic compounds such as paclitaxel and Medroxyprogesterone Acetate (MPA). Paclitaxel, a first-line chemotherapeutic, is extremely water-insoluble and is currently marketed mainly as *Taxol*® (paclitaxel in Cremophor EL/ethanol) or *Abraxane*® (albumin-bound nanoparticles). Both formulations have limitations—Cremophor EL is associated with severe hypersensitivity reactions, while albumin-bound systems require costly, complex manufacturing. MPA, widely used in oncology and women's health, is typically delivered as oil-based intramuscular injections or oral tablets, both of which suffer from poor solubility, variable absorption, and high-dose requirements. FAST (Facilitated Self-Assembling Technology) represents a paradigm shift. This excipient-free, water-based process enables lipophilic drugs to self-assemble into stable, amorphous nanoparticles, dramatically enhancing dissolution and bioavailability while eliminating toxic carriers or surfactants. Applied to paclitaxel, FAST could offer safer, potentially oral or low-toxicity IV options. For MPA, FAST may enable consistent, lower-dose formulations with improved pharmacokinetics, supporting both therapeutic efficacy and patient adherence.

Biography

Dr. Stephen Hsu earned his Ph.D. from the University of Cincinnati College of Medicine in 1990. He later worked at Memorial Sloan-Kettering Cancer Center and the National University of Singapore before joining the Dental College of Georgia at Augusta University in 1999, where he is now a tenured professor. Dr. Hsu has invented multiple technologies and products for conditions such as xerostomia and viral infections, supported by Phase II clinical trials. His NIH-funded research focuses on applying a novel nanotechnology platform—FAST—to develop advanced therapeutics and expand applications in oral health, infectious disease, and beyond.

Beyond oncology and hormone therapy, FAST is broadly applicable to drug candidates, existing drugs, nutraceuticals, antimicrobials, and CNS-active agents, aligning with clean-label and sustainability trends. This presentation will review preclinical data, market feasibility, and future outlooks, demonstrating how FAST can transform drug delivery across therapeutic categories.

Thomas J. Webster

School of Health Sciences and Biomedical Engineering, Hebei University of Technology, Tianjin, China; Division of Pre-college and Undergraduate Studies, Brown University, Providence, RI USA; School of Engineering, Saveetha University, Chennai, India

Eliminating implant failure in humans with nanomaterials: 30,000 cases and counting

Nanomedicine is the use of nanomaterials to improve disease prevention, detection, and treatment which has resulted in hundreds of FDA approved medical products. While nanomedicine has been around for several decades, new technological advances are pushing its boundaries. For example, this presentation will present an over 25 year journey of commercializing nanomaterials for orthopedic implants now in over 30,000 patients to date showing no signs of failure. Current orthopedic implants face a failure rate of 5–10% and sometimes as high as 60% for bone cancer patients. Further, this talk will present future research directions into using Atomic Layer Deposition (ALD) to create such nanostructures on implants to reduce infection and improve bone growth. Sensors grown off of orthopedic implants using ALD will also be discussed in which cell presence on orthopedic implants can be detected and quantified. Such information can also be communicated to a handheld device to better inform surgeons on chances of implant success or failure. Such sensors can also release pharmaceutical agents and/or nanoparticles on-demand to ensure implant success. Lastly, this talk will cover how Artificial Intelligence (AI) can be combined into today's orthopedic implants to predict implant success or failure in the years that follow.

Biography

Thomas J. Webster's (H index: 134) 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 formed over a dozen companies who have numerous FDA approved medical products currently improving human health in over 30,000 patients. He currently serves as CSO of Novaurum whom is pioneering the use of ALD in medical devices. He is also currently serving as a professor at Brown University, Saveetha University, Hebei University 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 55,000 citations. He was recently nominated for the Nobel Prize in Chemistry. Prof. Webster also recently formed a fund to support Nigerian student research opportunities in the U.S.

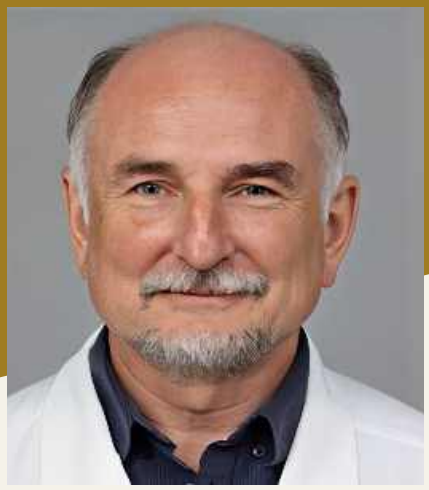
Vladlen Slepak

Department of Molecular and Cellular Pharmacology, University of Miami Miller School of Medicine, Miami FL, USA

Ectopically expressed olfactory receptors as an untapped family of drug targets. Discovery of agonists and antagonists of OR51E1, an understudied G protein-coupled receptor

Over 30% of pharmaceuticals act on G Protein-Coupled Receptors (GPCRs), the largest family of human genes (~800). About 50% of GPCRs (~400) are Olfactory receptors (ORs); these GPCRs were originally discovered in the nasal epithelium, where they mediate the sense of smell. However, members of OR family are also found in airways, blood vessels, gut and other normal tissues, in tumors and cancerous cell lines. The functions of ORs are just beginning to come to light, and some evidence indicates that they are involved in sensing metabolites. Considering the broad expression of the ectopically expressed ORs ("ectopic ORs") in tissues, their genetic linkage with human disorders and general GPCR drug ability, they represent a vast family of promising drug targets. Yet, their pharmacological potential is untapped. Several technical obstacles have been impeding progress in OR investigation for decades. These include difficulty of OR expression in functional form, lack of antibodies and effective pharmacological tools. Having overcome some of these difficulties, we performed the first High Throughput Screen (HTS) of small compound libraries for molecular probes for an OR, OR51E1. We chose this OR for several reasons: Its link to prostate cancer; involvement in regulation of blood pressure and unusually high evolutionary conservation (95%) between humans and other mammals, indicative of

Biography



Dr. Vladlen ("Vlad") Slepak studied Biology at the Moscow State University, USSR and graduated with MS in 1983; he received his PhD at the Shemyakin Institute of Bioorganic Chemistry in Moscow in 1988. In 1990 he joined the research group of Dr. Melvin Simon at the California Institute of Technology (Caltech), USA as a postdoctoral fellow. In 1995, he established his lab at the Department of Molecular and Cellular Pharmacology at the University of Miami where he currently a Professor. Dr Slepak published over 80 papers on mechanisms of G protein signaling in the retina, pancreas and other physiological systems.

its important physiological function. We identified ~100 novel small compound agonists and several antagonists. All the new agonists increase cAMP in a OR51E1-dependent manner, and with EC50 10-1000 lower than butyrate, the previously identified OR51E1 agonist. Some new agonists also affect prostate cancer cell proliferation. The work on characterization of new compounds and their application as tools to study the function of OR5E1 is on-going. In summary, our results demonstrate that successful discovery of drug-like compounds targeting ectopically expressed ORs is possible.

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Innovative development and delivery of biologics for chronic obstructive pulmonary disease

It is well known that Chronic Obstructive Pulmonary Disease (COPD) is a common and devastating lung disease with a high mortality. The current therapeutics for this disease are neither specific nor very effective. Moreover, the pathogenesis mechanisms for this disease remain largely unknown. COPD is well characterized by airway hyperresponsiveness and remodeling, thereby leading to airflow limitation. A very important player in airway hyperresponsiveness and remodeling in COPD is an increase in intracellular calcium ($[Ca^{2+}]i$) in airway smooth muscle cells (ASMCs). $[Ca^{2+}]i$ is well generated and controlled by multiple ion channels. In the current studies, we have started to explore which type of ion channels may mediate the increased $[Ca^{2+}]i$ in ASMCs and COPD. Using the patch clamp recording, the Nobel Prize winners' technology, together with specific channel antibodies, we have found that Type-3 Canonical Transient Receptor Potential (TRPC3) non-selective cation channel, showed a predominant activity and expression among the entire TRPC channel family in ASMCs. Similarly, using the SMC promoter SM22α-driven TRPC3 channel shRNAs, we confirmed the predominant TRPC3 channel activity and increased $[Ca^{2+}]i$ in ASMCs. This channel protein expression was significantly increased in COPD human ASMCs. The increased TRPC3 channel expression was highly correlated with ASM remodeling in COPD. In support, proliferation of human COPD ASMCs was abolished by the specific channel inhibitor Pyr3. Like Pyr3, TRPC3 channel gene knockdown (KD) by its

Biography

Dr. Wang has been a Full Professor at Albany Medical College since 2006. He had his MD, PhD and extensive postdoctoral training. Dr. Wang's research projects have been supported by a number of research awards from NIH, American Heart Association, American Diabetes Association, American Lung Association, and other agencies. He has had numerous publications in Nature Commun (impact factor: 17.694), Antioxid Redox Signal (8.401), Proc Natl Acad Sci USA (12.779), Nature (69.504), Circ Res (23.218), and other highly peer-reviewed journals. Moreover, Dr. Wang has served as the editorial board member, section editor, and the executive committee member and/or subcommittee chair.

specific shRNAs also blocked the increased proliferation of COPD human ASMCs. In contrast, TRPC3 channel gene overexpression produced an opposite effect. It is known that up to 90% of COPD are attributable to cigarette or e-cigarette smoking (CS or eCS), and nicotine is a most important biological component of CS and eCS. Indeed, nicotine inhalation induced airway hyperresponsiveness and remodeling in mice. These nicotine-induced responses were completely eliminated by intravenous injection of lentiviruses containing SMC promoter SM22α-driven mouse TRPC3 channel shRNAs using a hydrodynamic injection technique. TFSEARCH program predicts that the TRPC3 channel promoter region has the transcription factor NFκB binding sites. Thus, NFκB may mediate the increased TRPC3 channel expression and activity in COPD. Consistent with this view, nicotine significantly increased the activity of the transcription factor NFκB and the total expression levels of the key NFκB subunit p65 and p50 in human ASMCs. Moreover, both p65 and p50 expression levels were largely increased in the nucleus, but correspondingly decreased in the cytosol. Nicotine also largely increased TRPC3 channel promoter activity and this effect was blocked by the NFκB inhibitor Bay 11-7082. This NFκB inhibitor also blocked nicotine-induced TRPC3 channel mRNA expression in human ASMCs. Similarly, the NFκB subunit p65 and p50 gene KD produced a similar effect. Taken together, a series of our pharmaceutical chemistry studies have for the first time discovered that cigarette smoking or nicotine inhalation increases TRPC3 channel expression, channel activity, and $[Ca^{2+}]i$ in ASMCs, thereby leading to airway hyperresponsiveness and remodeling (i.e., COPD). The increased TRPC3 channel expression and activity are attributed to the increased NFκB expression and activity in ASMCs. Moreover, TRPC3 channel and NFκB biologics and inhibitors may become novel and effective treatments for COPD.

BOOK OF ABSTRACTS

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12th Edition of Global Conference on

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SEPTEMBER

11-13

ORAL PRESENTATIONS

Pereira Andre L

Professor, Escola de Saúde Pública do Estado de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil

Pharmacopollution: Trends over time

Pharmacopollution is a public health and environmental outcome of some Active Pharmaceutical Ingredients (API) and Endocrine-Disrupting Compounds (EDC) dispersed through water and/or soil. Its most important sources are the pharmaceutical industry, healthcare facilities (e.g., hospitals), livestock, aquaculture, and households (patient excretion and littering). The last source is the focus of this presentation. Household Waste Medicine is part of the emerging contaminants, such as steroid hormones, Pharmaceuticals and Personal Care Products (PPCP), industrial chemicals, and pesticides. The presentation shows the evolution in the number of scientific articles related to pharmaceutical pollution published between 2023 and 2025 on Researchgate, as well as conference papers on the subject, highlighting the growing interest in this topic. It will also present data on the volume of unused medicines collected through the Brazilian reverse logistics program for the years 2020 to 2023.

Biography

Andre Luiz Pereira is a PhD Professor, researcher, and senior consultant in the management of artificial intelligence projects in healthcare; pharmaceutical pollution; drug delivery; public health; and public policy. He is an Engineer at one of industry leaders applying AI to create real-world solutions and featured in the Google Economic Impact Report Brazil 2024. Among the Top 50 Future Leaders of the State of Minas Gerais award, FedEx Logistics Professional of the Year 2014, and the 9 Public Management Excellence Award. He has Coordinated the public policy for home pharmaceutical logistics from 2012 to 2014. He is an author of several articles (including A1 level) and. Peer reviewer for the Pan American Journal of Public Health, Environmental Science and Pollution Research, and Waste Management. Andre Luiz Pereira holds a PhD in Environmental Sanitation, Environment, and Water Resources Engineering (CAPES level 7), a Masters in Reverse Logistics Management, an MBA in Hospital Administration, a specialization in healthcare services accreditation, a Bachelors degree in Administration, and is a Software Engineer with a focus on Artificial Intelligence. EXIN Data Privacy and LGPD Protection Certified Professional.

Anil Pareek

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Epigenetics in drug development: Unlocking novel therapeutic strategies for precision medicine

Epigenetics, the study of heritable changes in gene expression that do not involve alterations to the DNA sequence, has revolutionized our understanding of complex biological processes and disease mechanisms. In drug development, epigenetics offers promising avenues for identifying novel therapeutic targets, personalizing treatment strategies, and improving drug efficacy and safety. Epigenetic mechanisms, such as DNA methylation, histone modifications, and non-coding RNA regulation, play critical roles in modulating gene activity and are often dysregulated in diseases, including cancer, autoimmune disorders, and neurological conditions.

Drugs targeting epigenetic enzymes, such as DNA Methyltransferases (DNMTs) and Histone Deacetylases (HDACs), have already shown success, with several epigenetic drugs approved for clinical use in oncology. Additionally, advances in epigenomics and next-generation sequencing enable the identification of disease-specific epigenetic signatures, facilitating the development of biomarkers for early diagnosis, prognosis, and treatment response prediction. Moreover, the reversibility of epigenetic modifications presents a unique opportunity to design drugs capable of restoring normal gene expression patterns.

Despite its potential, challenges such as off-target effects, limited tissue specificity, and the need for comprehensive understanding of epigenetic networks must be addressed. This review highlights recent progress in the field, discusses innovative technologies driving epigenetics-based drug discovery, and explores future directions to harness the full potential of epigenetics in precision medicine.

This paradigm shifts underscores the transformative role of epigenetics in bridging the gap between molecular insights and therapeutic advancements, paving the way for more effective and individualized treatment options.

Keywords: Epigenetics, Drug Development, DNA Methylation, Histone Modifications, Non-coding RNA, Epigenetic Enzymes, Biomarkers, Precision Medicine, Targeted Therapy, Epigenomics.

Biography

Dr. Anil Pareek has completed B. Pharm. from L. M. College of Science and Technology, Jodhpur (Raj.) in 2002, M. Pharm. from J.S.S. College of Pharmacy, Ooty (TN) in 2007 and PhD from R.U.H.S., Jaipur (Raj.) in 2014. Dr. Pareek has been working at L. M. College of Science and Technology, Jodhpur (Raj.) since 2007, currently associate professor in department of pharmaceutics and taught various subject in department at UG and PG level. His area of expertise is microbial technology, animal cell culture techniques, cytotoxicity study, NDDS etc. Dr. Pareek has continued to maintain active research on free radical biology and natural antioxidants.

Anna W. Sobańska[1*], Andrzej Sobański[2]

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Psychedelic drugs – Safety problems in pregnancy

Psychedelic drugs acting upon the serotonergic receptors are currently considered to be not only substances of abuse, but also the hope of new therapies of mental problems such as depression, PTSD and eating disorders; pain; inflammations or even asthma. The main challenge in this field is to design new compounds that would give similar therapeutic effects but without hallucinogenic activity. There are hundreds new compounds designed to have such properties, but not everything is known so far about their safety, especially for potential unintentional users–offspring during pregnancy and breastfeeding, susceptible to risks associated with maternal drug use or abuse.

In this research 250 new compounds derived from 3 main psychedelic substances–LSD, mescaline and psilocin were investigated in the context of their ability to cross the placenta and to interfere with placental enzymes responsible for deactivation of harmful xenobiotics - glutathione-s-transferase (GST) and N-acetyl transferase 2 (NAT-2).

Novel QSAR models of Fetus-Mother partition coefficients (FM) were used to estimate this property for studied compounds. Models were developed using calculated physico-chemical descriptors describing molecules' size, lipophilicity and electronic properties using Multiple Linear Regression and LASSO regression methods. It was confirmed that the ability of compounds to cross the placenta is related to their ability to be absorbed from the gastro-intestinal tract estimated according to very simple, yet useful empirical guidelines (Lipinski's Rule of 5). It turned out that almost all the studied compounds (250 psychedelics and their derivatives) are likely to cross the placenta easily by passive diffusion.

Four compounds (psilocybin, psilocin, mescaline and LSD) were investigated by molecular docking to estimate their affinity for the GST and NAT-2 enzymes. These affinities are relatively high which suggests the possible ability of these compounds to interfere with studied enzymes, but further studies are needed to confirm this hypothesis (e.g. by dynamic simulation methodology).

To conclude, new compounds from the chemical families of tryptamines, phenylethylamines and lysergic acid derivatives (structurally related to psilocin, mescaline and LSD, respectively) are likely to cause issues when used during pregnancy-but further, more detailed research in this area is recommended.

Biography

Dr. Anna W. Sobańska 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. In 2024 she became a Professor of the Medical University of Lodz.

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Identification of sulfonamide-based aromatase inhibitors in the breast cancer research

Breast Cancer (BC) represents the type of cancer that most frequently affects women and one of the leading causes of death among females worldwide. Approximately 70% of cases of BC are estrogen dependent (Hormone Receptor-Positive, HR+), since high levels of these hormones are needed for its growth and proliferation. The most effective treatment for ER+ is endocrine therapy, which reduces growth rate and proliferation by modifying ER signaling.

Aromatase is a key enzyme that converts androgens to estrogens by the process known as aromatization. Aromatase inhibition is an established therapeutic option for the treatment of postmenopausal BC, and current developments indicate that it will become more important over the coming years. Studies have shown that Aromatase Inhibitors (AIs) are effective when used as adjuvant therapy to chemotherapy and surgery in metastatic estrogen-dependent BC. AIs are categorized as either steroidal or nonsteroidal inhibitors depending on their structure scaffold.

Our working group investigates the medicinal chemistry and cell biology of non-steroidal AIs, mainly exploring the introduction of rigid and highly delocalized aromatic moiety or heteroaromatic rings, discovering molecules with potent anti-aromatase activity.

This talk presents a work-in-progress study of new aromatase inhibitors. I show the main results and the directions of our ongoing research, considering the impact of structure modifications on anticancer activity.

Biography

Prof. Barbara De Filippis got her PhD in Pharmaceutical Sciences at the University of Chieti (Italy) and is currently an Associate Professor in Medicinal Chemistry. Her research work is focused on the design and synthesis of small molecules with anticancer, antimicrobial and neurotrophic activities. Her studies are related on derivatives of natural phenols, as resveratrol and caffeic acid. She is author/co-author of many international papers and guest editor and reviewer for many journals.

Ayse Nur Oktay

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GastroPlus® and ADMET Predictor™ driven predictive model for pharmacokinetic parameters of ENDOL® immediate-release capsule

BrIn silico tools have become indispensable for preclinical assessment of pharmacokinetic parameters of drug. Several commercial software platforms, such as GastroPlus®, PK-Sim®, Stella®, and GISim®, offer comprehensive simulation capabilities for drug Absorption, Distribution, Metabolism, and Excretion (ADME). Among these, GastroPlus® stands out by integrating pharmacokinetic and pharmacodynamic modeling, allowing the construction of ADME models to simulate drug behavior across various routes of administration.This study aims to simulate the Pharmacokinetic (PK) profile of indomethacin 25 mg Immediate-Release (IR) capsules(marketed as Endol®) using an integrated platform of ADMET Predictor™ and GastroPlus™9.8. For this purpose, ADMET Predictor™ module was used to generate physicochemical and biopharmaceutical parameters including molecular weight, logP, pKa and solubility etc. Additionally, literature-derived values for Clearance (CL), Volume of Distribution (Vd), the contribution of intestinal metabolism (in vitro KM and Vmax values for CYP2C9 and UGT2B7), free fraction in plasma, permeability in Caco–2 cells, blood to plasma ratio were manually entered into the simulation. These parameters were transferred into GastroPlus™ 9.8 through integrated modeling. In vitro dissolution profiles of Endol® immediate-release capsules (25 mg) were obtained using the method described in the USP dissolution database. Briefly, dissolution used USP Apparatus 1(basket method) at 37±0.5^{0}C at 100rpm with three replicates. Medium was 750 mL of PBS (pH7.2):Water (1:4v/v). Samples were taken at determined time points (5, 10, 15, 20, 30, 45, 60, 90, 120, 180, 240 and 360 min), filtered through 0.45 mm Millipore filter, and assayed by ultraviolet visible spectrophotometry at 272 nm. Then all were incorporated into the Advanced Compartmental Absorption and Transit model to predict plasma concentration-time profiles following oral administration under fasted conditions in healthy adult subjects. The simulated profiles were compared to the observed PK profile obtained from literature. The dissolution study showed that the Endol® capsules reached 100% dissolved by 20min. The simulated plasma profile showed a peak concentration (C_{max}) of approximately 2.22 µg/mL and a time to peak (T_{max}) of 0.72 hours, closely aligned with reported clinical literature values (C_{max}~2 µg/mL; T_{max}~1–2 h). While the observed $AUC_{(0-t)}$ and $AUC_{(0-\infty)}$ values were 4.2 and 4.3 µg.h/mL, model-predicted AUC0-t and $AUC_{0-\infty}$ were found 4.15 and 4.16 µg.h/mL, respectively. All values met the verification criterion, with predicted-to-observed ratios falling within the acceptable range of 0.80 to 1.20. The model effectively captured the rapid absorption and biphasic elimination characteristics of indomethacin, consistent with established pharmacokinetics. This study demonstrates that simulation-based modeling

using both experimental dissolution data and compound-specific PK parameters can reliably reproduce clinical pharmacokinetics of a marketed oral formulation. The ADMET Predictor–GastroPlus integrated approach offers a valuable tool for formulation design, in vitro–in silico correlation and early-stage drug development decision-making.

Biography

Ayşe Nur Oktay is an Assistant Professor in the Department of Pharmaceutical Technology at the University of Health Sciences, Gülhane Faculty of Pharmacy, Turkey. She earned her Ph.D. in Pharmaceutical Technology from Gazi University under the supervision of Prof. Dr. Nevin Çelebi. Following her doctoral studies, she joined the research group of Prof. James Polli at the University of Maryland, Department of Pharmaceutical Sciences, as a visiting scientist. Her research interests include nanosuspensions, high-pressure homogenization techniques, spray dryer,liquisolid sytems, film casting, nanogels, nanoemulsions, skin permeability, Quality by Design (QbD), drug delivery systems, dissolution and permeation studies, micelle diffusion, and mathematical modeling. She is the inventor of three research projects funded by the Gazi University Scientific Research Projects Unit and The Scientific and Technological Research Council of Turkey (TÜBİTAK). Dr. Oktay has presented her work at national and international scientific conferences and has authored publications in peer-reviewed SCI(E) journals.

Dr. Bindiya Chauhan

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Quality assurance framework for implementing therapeutic drug monitoring in preterm infants: Enhancing safety and precision in neonatal care

Therapeutic Drug Monitoring (TDM) is essential in preterm infants due to their unique pharmacokinetics and heightened susceptibility to drug toxicity and therapeutic inefficacy. This study proposes a structured Quality Assurance (QA) framework to enhance TDM practices in neonatal care, addressing accuracy, consistency, and regulatory compliance in managing medication for this vulnerable population.

The QA framework includes standardized protocols for blood sample collection, timing, and processing protocols—critical steps for achieving precise drug concentration measurements. Emphasis is placed on method validation, including calibration and control processes that ensure analytical accuracy across all measurement stages. Additionally, a streamlined communication protocol among clinicians, laboratory personnel, and pharmacists supports timely and accurate dose adjustments, enabling real-time response to infants' changing physiological states.

Key to this system is Continuous Quality Improvement (CQI), which integrates routine audits, adherence tracking, and staff training. This cycle of CQI allows for early identification and correction of deviations, promoting a high standard of practice. Educational initiatives for neonatal and laboratory staff on preterm pharmacokinetics further mitigate variability and reinforce method reliability. The QA approach also lays the foundation for potentially integrating advanced tools, such as predictive modeling, which could provide more precise and individualized dosing adjustments.

Preliminary findings demonstrate that this QA-based TDM system enhances drug safety and therapeutic outcomes, with reduced incidence of adverse drug reactions and improved achievement of target drug concentrations. These results support the need for QA-driven TDM systems in neonatal care, emphasizing that rigorous, standardized practices are critical for managing drug therapy in preterm infants. Future efforts will focus on refining this QA framework and expanding it to include cutting-edge predictive analytics to individualize drug therapy for neonatal patients further.

Preliminary findings show that this QA-driven TDM system improves drug safety and outcomes in preterm infants, reducing adverse reactions and enhancing target concentration achievement.

Keywords: Quality Assurance, Therapeutic Drug Monitoring, Preterm Infants, Safety, Precision, Neonatal Care.

Biography

Dr. Bindiya Chauhan is an Associate Professor at SGT College of Pharmacy, SGT University, Gurugram, with ten years of academic, research, and industry experience (Biocon & Ajanta Pharma). She holds a B.Pharm from Jamia Hamdard, M.Pharm from JSS University, and a Ph.D. from KAHER, KLE University. Her expertise includes bioanalytical methodologies, therapeutic drug monitoring, and population pharmacokinetics. She has published extensively, holds patents, and specializes in LC-MS, HPLC, and PK/PD analysis. Proficient in SAS, R, and SQL, she actively contributes to pharmaceutical research, innovation, and professional training through conferences and workshops.

Consolata Nsanzubuhoro, Robert William McClelland Pott

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Enhancing delivery of biopharmaceutics classification system Class II drugs through a novel carrageenan-alginate-oleogel matrix: A case study on praziquantel for improved therapeutic efficacy

Schistosomiasis, a waterborne Neglected Tropical Disease (NTD) prevalent in sub-Saharan Africa and South-East Asia significantly impacts socio-economic development. Praziquantel (PZQ) serves as the primary treatment, effective against all human schistosome species. However, PZQ's bitter taste, lipophilicity, and substantial first-pass metabolism post-oral administration result in low patient compliance and requires high dosages for efficacy. Additionally, while effective against adult worms, PZQ is limited in treating juvenile worms, which then contribute to ongoing disease transmission and re-infection. Furthermore, the exclusive reliance on a single therapeutic agent for a disease with high morbidity and mortality raises concerns, and the potential emergence of resistance without an alternative drug could lead to severe consequences. Despite this severity, the current treatment options for this NTD remain limited. The limitations associated with PZQ drive the motivation behind this research effort, with the aim to develop an innovative drug delivery system using κ-Carrageenan (κ-CG), Alginate (AG), and oleogel to enhance the efficacy of PZQ.

These components are selected for their unique mechanical properties and advantages in drug delivery systems. AG, a naturally occurring linear polysaccharide extracted from brown seaweed, is biocompatible, non-toxic, and water-soluble. It has demonstrated promise in targeted drug delivery, especially in the intestines, owing to its potential to shield the drug from the harsh conditions of the stomach in the gastrointestinal tract. κ-CG is a natural polysaccharide extracted from red seaweed and exhibits excellent gel properties. The incorporation of a drug-loaded oleogel (DLO) into the matrix will serve as a drug reservoir, improving intestinal absorption of PZQ. This study leverages the AG/κ-CG matrix to protect the drug-loaded oleogel within the harsh acidic stomach environment, where it will form a protective gel during its passage through the GI tract. As it progresses into the intestinal environment with a more neutral and alkaline pH, which is the preferable site for drug absorption, the AG/κ-CG matrix will dissolve, gradually exposing the drug-loaded oleogel. In the presence of bile salts and lipase enzymes, the oleogel will undergo breakdown, leading to the sustained release of the drug at the preferred absorption site. This innovative approach aims to enhance drug bioavailability, potentially reducing the required dosage.

The study will explore the ternary matrix formulation by conducting a comprehensive analysis of the structural and physical properties of the material contained within this matrix. This in-depth investigation is crucial for our goal of achieving sustained release in the intestines. To gain an understanding of the physical and structural properties of the materials within the matrix, this study will employ various analytical techniques for the characterisation of the material. These include the use of Differential Scanning Calorimetry (DSC) and Thermogravimetric Analysis (TGA) for investigating thermal behaviour, confocal light microscopy for qualitative observations of material morphology, Fourier-Transform Infrared Spectroscopy (FTIR) to understand breakdown mechanisms through band appearance and disappearance, High-Performance Liquid Chromatography (HPLC) for quantifying release material concentration, and a texture analyser for determining the Young modulus, which quantifies material elasticity and rigidity. Furthermore, we will examine the release kinetics through dissolution studies using the United States Pharmacopeia 2 paddle method.

In addressing the limitations of PZQ and enhancing its drug delivery, this study holds promise for advancements in drug delivery strategies. In the context of NTDs, nanoparticulate systems offer a unique therapeutic alternative by improving existing drugs and enabling modified release for improved efficacy, minimal side effects, patient compliance and overall performance. The significance of this study, however, is not limited to NTDs; its applications can extend to broader pharmaceutical applications, enriching the expanding realm of knowledge in drug delivery systems and paving innovative paths for effective drug administration.

Biography

Consolata Nsanzubuhoro holds a Bachelor of Science degree from Rhodes University, South Africa, as well as a Bachelor of Science (Honours) and Master of Science from the University of Cape Town. Currently, she is a PhD candidate in the Department of Chemical Engineering at Stellenbosch University. A passionate chemist and biochemist with a background in microbiology, her expertise spans chemical synthesis, characterisation, and analysis, with a strong commitment to good laboratory practices. She is meticulous, with extensive hands-on experience using advanced laboratory equipment applicable across various industries.

Daré Regina Gomes[1*], Lopes Luciana Biagini[1], Petri-Fink Alke[2,3]; Rothen-Rutishauser Barbara[2]

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Therapeutic efficacy of Nanostructured Lipid Carriers co-loaded with Simvastatin and Adenosine (NLC-SA) in a human epidermal model of diabetic chronic wound

Chronic wounds are characterized by persistent inflammation, elevated oxidative stress, and impaired tissue repair, posing a major clinical challenge, particularly in diabetic patients. In this study, we established a Reconstructed human Epidermis (RhE) model using primary Neonatal Human Epidermal Keratinocytes (NHEKs) to simulate the hyperglycemic and pro-inflammatory milieu typical of diabetic chronic wounds. This model was then used to assess the therapeutic efficacy of nanostructured lipid carriers co-loaded with simvastatin and adenosine (NLC-SA), previously developed and characterized[1]. Epidermal tissues were cultured at the air-liquid interface for 14 days to ensure full stratification and differentiation. Subsequently, tissues were exposed to high glucose (40 mM) combined with TNF-α (40 ng/mL) for 5 days via the basolateral compartment, inducing a sustained inflammatory state. This condition was selected based on preserved metabolic activity (WST-1 assay) and the marked increase in IL- 8 and IL-1α secretion, quantified by ELISA. Following inflammatory induction, tissues were treated with NLC-SA (at multiple concentrations), free drug combinations, or unloaded NLCs for 2 or 5 days. Treatment efficacy was evaluated through cell viability, cytokine profiling (IL-8, IL-1α, IL-6), Vascular Endothelial Growth Factor (VEGF) secretion (ELISA), and histological analysis. A comparative evaluation of epidermal models generated with either immortalized HaCaT cells or primary NHEKs revealed significant differences in tissue architecture and functional properties. While both models formed multilayered epidermal structures, the NHEK-based epidermis displayed superior stratification, with six viable cell layers and a well-developed stratum corneum, compared to the HaCaT-based model, which exhibited only three viable layers and no evident cornified layer. Additionally, the total epidermal thickness and Transepithelial Electrical Resistance (TEER) values were significantly higher in the NHEK model, indicating enhanced barrier integrity and tissue maturation. These differences were also reflected in the inflammatory response: although both models responded to glucose+TNF-α exposure, the NHEK model exhibited a more consistent and robust cytokine release profile, for IL-1α and IL-8, while HaCaT-based tissues showed greater variability and lower sensitivity to pro-inflammatory stimuli. Treatment with NLC-SA significantly improved cell viability and reduced the secretion of IL-8, IL-1α, and IL-6 in the inflamed NHEK-epidermis model, compared to the untreated group. Moreover, NLC-SA treatment promoted an increase in VEGF production, suggesting a potential pro-angiogenic effect. Histological examination confirmed the protective effects of NLC-SA, with dose-dependent recovery of epidermal

architecture. Notably, the highest NLC-SA concentration restored epidermal morphology to a state comparable to that of untreated, non-inflamed controls. In conclusion, the inflammatory NHEK-based epidermis model offers a relevant in vitro platform for mimicking chronic wound conditions. Compared to HaCaT-based models, the NHEK epidermis better replicates the structural and functional features of native human skin. The NLC-SA system demonstrated therapeutic potential by modulating inflammation and supporting epidermal recovery, providing a promising approach for the topical treatment of chronic wounds.

Biography

Dr. Regina Gomes Daré is a postdoctoral fellow in Pharmacology at the University of São Paulo and currently a visiting researcher at the Adolphe Merkle Institute, University of Fribourg (Switzerland). She holds a Ph.D. in Pharmaceutical Sciences from the State University of Maringá (Brazil), with international experience at i3S (Portugal). Her research focuses on nanotechnology-based drug delivery systems and in vitro skin models for chronic wound applications.

Deepika Sharma
Associate Professor, CGC Landran Mohali, India

Therapeutic drug development using biopolymer degrading enzymes

Biopolymers play critical roles in structure, function, storage, and regulation of biological processes in living beings. Bacterial biopolymers, such as alginate, Lipopolysaccharides (LPS), Polyhydroxyalkanoates (PHAs), and Exopolysaccharides (EPS), play a crucial role in the pathogenicity and biofilm formation of many bacteria. Human biopolymers such as proteins (collagen), nucleic acids, polysaccharides, and lipid assemblies are essential macromolecules for performing various functions. Biopolymer degrading enzymes are emerging as powerful candidates for the development of novel therapeutic drugs due to their ability to target and break down complex biological macromolecules. Enzymes including proteases, glycosidases, lipases, and polysaccharide degrading enzymes, perform specific biochemical activity thus make them ideal for designing enzyme based therapies aimed at a range of diseases Nowadays, these enzymes are being explored as antibiofilm, anti-inflammatory and thrombolytic enzyme drugs for cancer therapy and drug delivery respiratory and mucolytic enzyme drugs. Keeping in mind, enormous therapeutic potential of biopolymer degrading enzymes, collagenase KU665299 from *Chryseobacterium contaminans* and alginate lyase SG4^{+} from *Paenibacillus lautus* is investigated in this work. Alginate lyase SG4^{+} exhibit strong biofilm-disrupting activity against *Pseudomonas aeruginosa*, a major pathogen in lung infections associated with Cystic Fibrosis (CF). The enzyme disrupted up to 64.6% of alginate-based biofilms and increased the bactericidal activity of gentamicin and amikacin. Simultaneously, collagenase KU665299 showed great promise for thrombolytic therapy by efficiently breaking down blood clots in 40 minutes at 37°C. Together, these enzymes exemplify promising bio-therapeutic agents—alginate lyase for treating biofilm-associated infections and collagenase for clot resolution—offering targeted, enzymatic approaches to critical clinical challenges.

Biography

Dr. Deepika Sharma has completed her PhD in year 2015 from Guru Nanak Dev University Amritsar, Punjab (India). She has done her postdoctoral studies from CSIR-Institute of Microbial Technology Chandigarh (India). She is currently working as Associate Professor in Research &Development Dept. CGC Landran Mohali, Punjab (India). Over 15 years of research experience in the purification and characterization of antimicrobial peptides (AMPs), with expertise in bacterial taxonomy using polyphasic and genomic approaches. She is highly skilled in interpreting research findings, authoring scientific reports, and leading research projects. She has successfully completed two minor research projects funded by Department of Science and Technology (DST), New Delhi. She has published various research papers in reputed international journals and book chapters. She has strong skills in research interpretation, drafting high-impact scientific reports, and effectively leading multidisciplinary research initiatives. Currently, mentoring three startups at ACIC RISE Association, CEC Landran. Actively

engaged in planning and executing outreach initiatives, capacity-building programs, workshops, and seminars to foster scientific awareness and collaboration.

Dr. Dharmendra Kumar*, Prof. (Dr) Pramod Kumar Sharma

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Formulation and evaluation of the Pilosomes as Drug Delivery System (PDDS)

One of the primary challenges in pharmaceutical dosage form development is the poor solubility of certain drugs, particularly those classified as Biopharmaceutics Classification System (BCS) Class IV. These drugs exhibit low solubility and permeability, resulting in suboptimal pharmacokinetics and limited bioavailability, which hinder their therapeutic potential and pharmaceutical development. This study focuses on developing a novel pilosomes drug delivery system, termed PDDS, to encapsulate a BCS Class IV drug using a novel lipid derived from pilu oil. The pilosomes were formulated using an emulsification-evaporation technique with specific modifications and were comprehensively characterized for their physicochemical properties, including average particle size, surface morphology, drug entrapment efficiency, drug loading capacity, in vitro drug release, and release kinetics. The prepared PDDS demonstrated an average particle size of 76.89 nm with a spherical morphology. The formulation achieved a percentage yield of 62.5%, drug entrapment efficiency of 90%, and drug loading capacity of 47.36%. In vitro drug release studies revealed that 24.27% of the drug was released within the first 2 hours, with a cumulative release of 75.18% over 12 hours. The release profile followed a zero-order kinetic model, indicating sustained and controlled drug release. These findings suggest that pilu oil serves as an effective novel lipid for the formulation of pilosomes drug delivery systems, providing enhanced encapsulation efficiency, drug loading capacity, and sustained release for BCS Class IV drugs. This research highlights the potential of PDDS as a promising platform for improving the bioavailability and therapeutic efficacy of poorly water-soluble drugs. Future investigations may further validate the utility of pilu oil-based Pilosomes for broader pharmaceutical applications.

Biography

Dr. Dharmendra Kumar is an Associate Professor & Head of Department of Pharmacy at Sanskaram University, Jhajjar, Haryana, India. Dr. Kumar has published over 12 Patents, 10 books and more than 25 research papers in prestigious journals indexed by SCI and Scopus. Dr. Kumar is actively involved with various publishing houses worldwide as an editor, author, and reviewer.

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Assessment of inulin content in *Arctium lappa* L. Root extract: Potential for nutritional and medicinal applications

Inulin, scientifically known as α-D-glucopyranosyl-β-D-fructofuranosyl-D-fructofuranoside, is a natural polysaccharide with diverse biological activities. It is widely used in the food and pharmaceutical industries as a soluble dietary fiber, sugar substitute, stabilizer, and excipient. Recent research has revealed additional benefits of inulin, including anti-cancer and immune-enhancing properties, further increasing its significance in health-related applications. Certain species within the Asteraceae family are particularly rich in inulin, including *Arctium lappa L., Cichorium intybus L., Helianthus tuberosus L., Cynara scolymus L.*, and *Inula helenium L.* Among these, *Arctium lappa L.*, commonly known as burdock, is a biennial medicinal plant that grows in various climates across Asia and Europe. Burdock root has long been used as a vegetable in Asian cuisine and as an herbal infusion, decoction, or tincture in European traditional medicine.

This study focuses on the extraction and quantification of inulin from *Arctium lappa L.* roots, using burdock root dietary supplements (Fares, Romania) and a chicory inulin standard (Intense, Poland, 100% chicory inulin).

Inulin extraction was performed by dissolving the sample in ultrapure water, followed by heating, centrifugation, filtration, and concentration. The inulin content was quantified using a colorimetric method involving a vanillin-sulfuric acid reaction, with absorbance measured at 520 nm. UV-Vis spectrophotometry (Agilent Technologies 8453) and standard calibration were used for quantification. Experiments were conducted in triplicate, and results were expressed as mean values ± standard deviation using SPSS 22.0 software. The analysis revealed that the inulin content in the burdock root sample was 74.68 ± 2.88%. While this indicates a high concentration of inulin, its content can vary depending on several factors, such as the age of the root, harvesting time, and the extraction and post-extraction processes employed.

In conclusion, the study highlights *Arctium lappa L.* as a valuable source of inulin, with significant potential for nutritional and therapeutic applications. Due to its solubility in hot water, inulin can be easily incorporated into beverages, dairy products, baked goods, and dietary supplements.

Further research is recommended to explore its full potential and optimize its extraction and utilization methods.

Keywords: *Arctium lappa* l. Root, Inulin, Oligosaccharides, UV-Vis Spectrophotometry.

Biography

Dr. Elena studied Pharmacy at the *Nicolae Testemitanu* State University of Medicine and Pharmacy (SUMPh), Chisinau, Republic of Moldova and graduated as Pharmacist in 2010. Then joined the research group of Prof. Valica Vladimir at the Drug Development Center and at the Department of Pharmaceutical and Toxicological Chemistry within the *Nicolae Testemitanu* SUMPh from Chisinau, Republic of Moldova. Dr. Elena received her PhD degree in 2020 at the same institution and in 2024. Dr. Elena obtained the position of an Associate Professor at the *Nicolae Testemitanu* SUMPh. Dr. Elena has published more than 50 research articles.

Gurpreet Singh

Vice President, Managing Director Integrated Safety, IQVIA, United Kingdom

Global drug development - Current trends, challenges and opportunities

- The entire process of developing a drug from preclinical research to marketing can take approximately 12 to 18 years and often costs well over $1 billion
- Global Top Pharmaceutical Companies based on projected R&D spending in 2026 are Roche, Johnson & Johnson, Merck & Co, Pfizer and Novartis
- The global **CRO services market** in terms of revenue was estimated to be worth $76.6 billion in 2023 and is poised to reach $127.3 billion by 2028

Global Drug Development Trends

- Increased Focus on Quality, Compliance and Quality Management System
- Requirements of Audit and Inspection readiness
- Process Enhancements, Changes, Improvements
- Further adoption of Technology and Tools, Database migrations
- Focus on Data Analytics and Trends
- Organisational Culture Enhancement –Focus on People Development, Training and Retention
- Change Management – Mergers/Acquisitions and Integrations

Global Drug Development Challenges & Opportunities

- Requirement of skilled resources
- Retention of Talent
- People Development Needs
- Standard Operating Procedures
- Better quality and compliance
- Need for better productivity
- Adoption of Technology
- Reduce cost per transaction
- Improve Efficiency

Biography

Gurpreet Singh is currently the Vice President, Managing Director Integrated Safety at IQVIA. Gurpreet is based in UK and has a total of 19 years' experience in Pharma Industry of which 17+ 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 Gurpreet 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. Gurpreet 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 Pharma conferences.

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Advances in hydrophilic drug delivery: Encapsulation of biotin in alginate microparticles

The encapsulation of hydrophilic drugs within microparticles has gained significant interest in drug delivery systems due to their potential to improve the stability, bioavailability, and controlled release of therapeutic agents. Biotin, a water-soluble vitamin, faces challenges such as rapid degradation and poor membrane permeability, limiting its therapeutic efficacy. This study aims to explore the formulation of biotin-loaded microparticles made with alginate, Eudragit E100, and $CaCl_2$, and to evaluate their characterization and potential applications. The microparticles were produced using the external ionic gelation process, where alginate and $CaCl_2$ solutions were mixed under probe sonication. Eudragit E100 was added as a complexing agent. The optimized formulation was used to encapsulate biotin, and various experimental variables were screened to study their influence on the properties of the microparticles. Biotin was encapsulated in alginate microparticles (size: 634 nm; polydispersity: 0.26; Z-potential: -45 mV) with an encapsulation efficiency of 90.5%. The Z-potential value indicates that the particles are stable (±30 mV). Their in-vitro release profiles were studied using vertical diffusion Franz cells showing a controlled release profile, which follows the Weibull model, highlighting also the critical influence of the carrier's internal structure on the release mechanism. Encapsulation techniques offer a promising approach to overcoming the limitations of hydrophilic drug delivery. The study successfully formulated and optimized biotin-loaded microparticles using alginate, Eudragit E100, and $CaCl_2$. These microparticles show high encapsulation efficiency, suitable physicochemical properties, and controlled release, making them potential candidates for therapeutic and cosmetic applications in both topical and oral formulations. Additional research is required to improve the scale-up process.

Biography

Iria Naveira-Souto graduated with a B.Sc. in Biology and a B.Sc. in Chemistry from the University of a Coruña, Spain in 2021. Iria has a M. Sc. In Pharmaceutical and Biotechnology Industry from the University of Pompeu Fabra, Spain. Iria is currently working as a Technician in Pharmaceutical Innovation at Reig Jofre, where they develop small drug delivery systems, as well as research into efficacy, safety, and biodistribution of bioactives using in vivo cellular models and ex vivo skin models. Iria is also an Industrial PhD candidate in Biotechnology at the University of Barcelona in collaboration with Reig Jofre.

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Evaluating *Aronia melanocarpa* varieties for pharmaceutical applications based on polyphenolic content and antioxidant activity

In recent years, the global community has been actively seeking plant-based sources with therapeutic and nutritional potential. The fruits of *Aronia melanocarpa* are widely recognized and utilized for these purposes. The challenges caused by global warming and changing climatic conditions require the development of new varieties with enhanced adaptability and resistance to environmental stressors, particularly for the steppe climate of the Republic of Moldova, while also addressing the growing demand for the sustainable use of natural resources in food and pharmaceutical applications.

The purpose of this study is to evaluate the Total Phenolic Content (TPC) and Antioxidant Activity (AA) of fruits and non-edible plant parts from two chokeberry varieties—'Nero', a well-established and widely cultivated variety across Europe and Asia, and 'Alexandrina', a newly developed variety by researchers at the "Alexandru Ciubotaru" National Botanical Garden in Chisinau—with a focus on their pharmaceutical potential.

The biological material for this research was collected during the fruit ripening period. Samples of the 'Nero' variety were obtained from the Scientific and Practical Center for Medicinal Plants at "Nicolae Testemițanu" State University of Medicine and Pharmacy, while samples of the 'Alexandrina' variety were sourced from the "Alexandru Ciubotaru" National Botanical Garden. The collected materials included fruits, leaves, one-year-old and three-year-old twigs, and their bark. Hydro-alcoholic extracts were prepared from dried fruits and non-edible plant parts, including leaves, twigs, and bark. The Total Phenolic Content (TPC) was measured using the Folin-Ciocalteu method and expressed as gallic acid equivalents (mg GAE/g). Antioxidant activity (AA) was evaluated through the DPPH radical scavenging assay, calibrated with trolox, and expressed as mg trolox equivalents (mg TE/g).

The Total Phenolic Content (TPC) across all analyzed samples ranged from 12.76 to 36.34 mg GAE/g. Overall, the 'Alexandrina' variety demonstrated higher TPC values than the 'Nero' variety, except in the leaves, where 'Nero' exhibited greater TPC. When comparing different parts of the 'Nero' variety, the highest TPC was recorded in the bark of one-year-old twigs (27.08 mg

GAE/g), followed by the leaves, one-year-old twigs, three-year-old twigs, the bark of three-year-old twigs, and finally, the fruits, which exhibited the lowest TPC (12.76 mg GAE/g). In contrast, the 'Alexandrina' variety had the highest TPC in one-year-old twigs (36.34 mg GAE/g), followed by the bark of one-year-old twigs, three-year-old twigs, their bark, leaves, and fruits, which also had the lowest TPC (13.71 mg GAE/g). The lowest AA was observed in 'Alexandrina' dried fruits (75.07 mg TE/g), while the highest AA values were found in 'Alexandrina' one-year-old twigs (236.82 mg TE/g) and 'Nero' three-year-old twigs (123.93 mg TE/g).

In conclusion, these findings emphasize that the non-edible parts of *A. melanocarpa*, including twigs, bark, and leaves, are valuable alternative sources of raw material, due to their high phenolic content and antioxidant activity, making them promising candidates for applications in the food and pharmaceutical industries.

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Biography

PhD student Iulia Bozbei studied Pharmacy at the “Nicolae Testemițanu” State University of Medicine and Pharmacy from Chisinau, Republic of Moldova and graduated in 2023. Then started to work as University Assistant at the Department of Pharmaceutical and Toxicological Chemistry and started her PhD studies in 2024 being part of the research project “Valorization of medicinal spontaneous and cultivated plants through the use of advanced micropropagation techniques as sources of bioactive compounds – BioMedPlant”.

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Comprehensive analytical and bioanalytical method validation for the quantification of linagliptin and empagliflozin in fixed-dose combinations

A comprehensive bioanalytical method was developed and validated for the simultaneous estimation of Linagliptin and Empagliflozin in fixed-dose combination formulations using UV spectrophotometry. This study emphasizes three distinct analytical approaches—Simultaneous Equation Method, Q-Absorbance Ratio Method, and Absorptivity Correction Method—to ensure accurate, precise, and reproducible quantification of both Active Pharmaceutical Ingredients (APIs) in a combined dosage form.

The selected methods utilized a solvent system of methanol and distilled water (1:1 v/v) and an optimized wavelength range of 250–300 nm. In the Simultaneous Equation Method, the absorbance was measured at 297.4 nm and 277.2 nm, the respective λ-max of Linagliptin and empagliflozin. The Q-Absorbance Ratio Method was based on absorbance measurements, The isosbestic point is 2 at 287.4nm. The Absorptivity Correction Method involved compensating for overlapping spectra using known absorptivity's to resolve individual drug concentrations. All three methods were validated as per ICH and USFDA guidelines. The calibration curves showed excellent linearity within the concentrations for both drugs. Recovery studies confirmed the methods' accuracy, with percentage recovery values within the acceptable range of 98–102%. The precision was demonstrated by %RSD values below 2% for both intra-day and inter-day studies. The developed Empagliflozin in bulk and pharmaceutical dosage forms. Among them, the Q-Absorbance and Absorptivity Correction methods provide a rapid, economical, and non-destructive analytical tool suitable for routine quality control of Linagliptin and methods offer additional advantages in terms of simplicity and applicability in overlapping spectral conditions.

Keywords: Bioanalytical Method Development, Fixed-Dose Combination, UV Spectrophotometry, Simultaneous Equation Method, Overlapping Spectra.

Biography

Dr. K. Bhavyasri holds a Ph.D. in Pharmaceutical Analysis & Quality Assurance, Pharmacy, and a PG Diploma in PQA & RA, with over 12 years of academic and research experience. She is Associate Professor & Head, Dept. of Pharmaceutical Analysis, RBVRR Women's College of Pharmacy, Hyderabad. She has guided numerous Pharm and Pharm projects, is a Ph.D. guide at Osmania and Vignan Universities, holds 11 patents, and has authored 196 international publications. Recipient of multiple awards, her expertise includes LC-MS/MS, HPLC, GC-MS, and spectroscopy techniques, with extensive contributions to conferences, workshops, and academic events.

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Formulation and characterization of buccal films based on sodium alginate and chitosan for using in parkinson's disease

Parkinson's disease is the second most common neurodegenerative disease in the world, 16-20 thousand people suffer from this disease in Hungary and more than 10 million people worldwide. The symptoms can be various, both non-motor and motor symptoms can appear. The biggest problem in the treatment of the disease is the difficulty in swallowing for the patients.

The aim of our experimental work was to produce and test a buccal polymer film containing pramipexole dihydrochloride as an active pharmaceutical agent. With this pharmaceutical form, due to the difficulty in swallowing in patients with who suffer in Parkinson's disease, the inappropriate application of the drug can be eliminated and thereby improve the success of the therapy. The biggest advantage of buccal films is that the patients do not have to swallow the dosage form, therefore the active substance is absorbed directly from the buccal mucosa into the systemic circulation.

For the preparation of polymer films, sodium alginate and chitosan were used as film-forming agent and pramipexole dihydrochloride was used as the active pharmaceutical ingredient. The physical properties of the prepared polymer films were examined, as well as the chemical interactions between components of films, using various methods such as FT-IR and RAMAN spectroscopy. Dissolution of the pramipexole from the polymer film was also investigated, as well as the permeation of the active ingredient through the cells of the TR 146 buccal cell line. Finally, the biocompatibility of the prepared polymer films was also tested on a buccal cell line.

Based on the results, it can be said that by increasing the concentration of glycerol, the tensile strength of the films increased in the case of both types of film-forming agent, but at the same time, glycerol reduced the in vitro mucoadhesive force values. Based on the results of Raman mapping, the active ingredient (pramipexole) was distributed homogeneously in the polymer films, and interactions were observed between the components of films, which were also confirmed by the FT-IR tests. All formulations were biocompatible.

Lisa Marinelli

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Drug delivery strategies for the management of microbial infections and wound healing

Infected and chronic wounds represent a significant healthcare challenge due to their complex healing processes and the presence of persistent microbial biofilms that interfere with tissue repair. Conventional antimicrobial agents often present limitations, such as poor water solubility, limited tissue penetration, and short half-life. These issues reduce therapeutic effectiveness and contribute to the global increase in antimicrobial resistance.

To overcome these challenges, we developed two classes of drug delivery systems, both loaded with water- soluble antimicrobial prodrugs, each designed to address specific therapeutic needs: one based on nanostructured clays, the other on Hyaluronic Acid (HA) hydrogels.

Nanostructured clays are known to provide a high surface area and adaptable interlayer spacing, enabling efficient encapsulation and protection of labile therapeutics from premature degradation. Our study demonstrated that clay-based hybrid formulations enhanced the chemical stability of encapsulated therapeutics and allowed their release under physiological conditions. Physicochemical analyses confirmed interactions between the prodrugs and clay matrices, while biological studies demonstrated notable antimicrobial activity of the formulations against pathogens commonly associated with chronic wound infections.

Hydrogel formulations combining water-soluble antimicrobial prodrugs with HA exhibited favorable viscoelastic properties and controlled drug release, making them ideal for topical use in infected or chronic wounds. The hydrogels accelerated wound healing by regulating critical biological factors involved in inflammation and tissue regeneration, thus supporting the natural repair process.

These multifunctional platforms combine antimicrobial agents with advanced drug carrier systems, offering a promising strategy for localized infection control and improved tissue repair. Their performance highlights strong translational potential in chronic wound management and antimicrobial therapy.

Biography

Dr. Lisa Marinelli is an Associate Professor at the “G. d’Annunzio” University of Chieti-Pescara (Italy). Her research interests focus on Pharmaceutical Technology including the preparation and characterization of drug delivery systems for the treatment of neurodegenerative and microbial diseases. Dr. Lisa is a founding partner and member of the Startup “Algo Biotechnologies s.r.l.”, and she has the role of CQO. Her scientific activity is documented through more than 60 publications in peer-reviewed international scientific journals (h-index: 22), and one patent.

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C. elegans as a platform for studying neurodegenerative diseases: Identification of antioxidants as therapeutics agents

The increase in life expectancy has led to a rise in age-related disorders, including Neurodegenerative Diseases (NDs) such as Alzheimer's disease (AD), Parkinson's Disease (PD), and Huntington's Disease (HD). Oxidative Stress (OS) plays a crucial role in the progression of these conditions, as impaired free radical scavenging can result in protein aggregation and subsequent proteotoxic damage. Given the established association between OS and NDs, antioxidant compounds represent a promising avenue for therapeutic intervention.

In this study, we utilized *C. elegans* models for NDs to evaluate the in vivo antioxidant properties and protective effects against neuronal protein aggregation of both synthetic and natural compounds. Our approach integrated genetic, microscopy, pharmacological, and behavioral techniques to elucidate the molecular mechanisms underlying these effects in *C. elegans* models.

We identified a synthetic imidazole derivative, 1-Mesityl-3-(3-Sulfonatopropyl) Imidazolium (MSI), and the natural compound geraniol as enhancers of OS resistance in *C. elegans*. Given the established link between antioxidant potential and anti-proteotoxic capacity, we further assessed the impact of these compounds in *C. elegans* models of AD, PD, and HD. Our results show that these compounds delay or prevent the onset of proteotoxic phenotypes associated with these NDs and reduce both protein aggregation and neurodegeneration. To better understand the protective mechanisms, we analyzed null mutants in key OS-related pathways. Our findings indicate that the transcription factor HSF-1 is essential for mediating the protective effects of MSI, while SKN-1/Nrf-2 specifically contributes to the protective actions of geraniol. Microscopy analysis also suggests that geraniol may promote autophagy, further contributing to its neuroprotective effects.

This study highlights the value of *C. elegans* as a model system for conducting accessible pharmacological assays aimed at identifying compounds with therapeutic potential. Our findings demonstrate that compounds with in vivo antioxidant properties also exhibit anti-proteotoxic and anti-neurodegenerative effects, underscoring the promise of antioxidants as effective agents against proteotoxicity.

Biography

Dr. De Rosa has been leading the Invertebrate Neurobiology Laboratory at the Institute of Biochemical Research of Bahía Blanca since 2014. Dr. Rosa received her PhD in 2001 from the same institution. She spent one year as a postdoctoral fellow under the supervision of Dr. Chan at the University of Massachusetts, USA, and an additional two years at the University of the South in Bahía Blanca. She is a researcher at CONICET and a professor at the University of the South. Dr. Rosa is the author of more than 20 publications in prestigious international journals.

Marilisa Pia Dimmito

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From self-assembly to healing: Engineering ultra-small peptides into supramolecular hydrogels for controlled drug release

The objective of this study was to assess the suitability of novel mucoadhesive hydrogel platforms for delivering therapeutics targeting Gastrointestinal (GI) disorders. To this end, we developed and characterized novel hydrogels based on self-assembling lipopeptides namely MPD02-09, created by covalently conjugating Lauric Acid (LA) to ultra-small peptide with the sequence Ser-Asn-Ala (SNA) and its derivatives. These were obtained by incorporating various combinations of D- and L-amino acids into the native SNA structure. LA conjugation was performed to enhance peptide stability, induce amphiphilicity, and promote hydrogel formation via self-assembly. Budesonide (BUD), an anti-inflammatory drug, commonly used for the treatment of GI disorders, was chosen as model drug to evaluate the loading capacity of these systems. Initial investigations examined how the conjugates’ chemical structures influenced key physicochemical properties relevant to drug delivery. Among these, two selected lipopeptides, MPD03 and MPD08, successfully formed hydrogels (MPD03h and MPD08h) with proper rheological properties and promising drug delivery characteristics. These include approximately 60% mucoadhesiveness, an important characteristic that allows the formulation to withstand peristaltic movements as well as the washing effect of body fluids, which reduce the percentage of drug payload available systemically, providing a certain oral viscous media suitable for intended therapeutic applications.

In vitro studies demonstrated that BUD-loaded hydrogels released around 70% of the drug within 6 hours. Wound healing assays using Caco-2 and HaCaT cells showed a reduction in cell-free area to below 10%. Together, these findings indicate that MPD03h and MPD08h are suitable candidates for the delivery of BUD in the management of GI disorders.

Biography

Dr. Marilisa Pia Dimmito received her master’s degree in Pharmaceutical Chemistry and Technology from the University “G. d’Annunzio” of Chieti-Pescara, Italy. At the same University, on 19th April 2021, she obtained her PhD in “Biomolecular and Pharmaceutical Sciences” with the additional title of “Doctor Europaeus”. Since 01st March 2021, she has been working as a Research Fellow on the preparation of novel hydrogels based on self-assembly peptides, as well as the development of novel drug delivery systems based on Multiple Lipid Nanoparticles (MLNs), Solid Lipid Nanoparticles (SLNs), and clay minerals.

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Lysozyme – enzybiotic as promising weapon against antimicrobial resistance

Antibiotic resistance is a global problem. The incidence and prevalence of antimicrobial-resistant-bacterial infections has attained incongruous levels during 21st century and threatens global public health as a silent pandemic, necessitating urgent interventions.

Enzybiotics are microorganism-degrading enzymes found in various natural sources. Although discovered a century ago, they were in the shade of antibiotics. The term enzybiotic implies those enzymes acting on the bacterial cell's wall degradation, the way in which lysozyme acts.

Lysozyme is among the most studied enzybiotics. Lysozyme meets the enzybiotic's criteria as it has primary antibacterial and antifungal effects, but also has additional effects: antiviral, anti-inflammatory, immunomodulatory and pro-regenerative. Enzymatic muramidase activity of lysozyme is responsible for killing primarily gram-positive bacteria. Lysozyme can also kill bacteria independently of peptidoglycan hydrolysis through a mechanism involving its cationic nature. The presence of two complementary bactericidal mechanisms (enzymatic and non-enzymatic) reduces the probability of complete escape of pathogenic bacteria from the antibacterial action of lysozyme. In the case of modification of the structure of peptidoglycan which increases the microorganism's resistance to the enzymatic action of lysozyme and even in the case of complete loss of the cell wall (L-shape), bacteria a priori remains more or less sensitive to the cationic mechanism of this protein.

The impact of prescribing antibiotics in the context of primary health care, especially broad-spectrum antibiotics and empiric prescribing, often without justified indications, is significant. Family doctors have a special role in bridging the problem of bacterial resistance, because 90% of antibiotics are prescribed for outpatient treatment. Approximately 70% of all antibiotics prescribed by these doctors used to treat acute upper respiratory infections (URI), which includes the acute pharyngitis. In 79% of cases, the use of antibiotics in URI was unnecessary.

Natural basis of lysozyme, along specifics of action and unique pharmacological effects in the absence of bacterial resistance, provides the ability to overcome the risk of antibiotic resistance using preparations based on lysozyme in the empirical treatment of viral and uncomplicated bacterial infections of the oropharynx.

Biography

Meliha Mehic, medical doctor, studied Medical Faculty University of Sarajevo and after graduation in 2004, she took her specialization degree from clinical pharmacology. In 2024, she got the highest expert degree in the field of medicine (the title of Primarius). Her 20-years working experience is linked to pharmaceutical industry with focus on evidence based medicine in relation to drugs and therapeutics. As expert from practice, she is engaged as lecturer at Sarajevo Medical School of Sarajevo School of Science and Technology. She has published more than 30 scientific articles.

Monica Arora

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Personalized medicine: Tailoring drug delivery systems for targeted therapeutic efficacy

Personalized medicine has emerged as a transformative approach in healthcare, focusing on optimizing therapeutic outcomes by tailoring drug delivery systems to individual patient needs. Traditional drug administration methods often exhibit limitations such as systemic toxicity, poor bioavailability, and lack of targeted action, leading to suboptimal patient responses. The advent of precision drug delivery systems aims to overcome these challenges by leveraging advancements in nanotechnology, biomaterials, and genetic profiling.

This presentation will explore the latest innovations in drug delivery strategies, including nanoparticle-based carriers, liposomes, hydrogels, and smart polymers that enable site-specific drug release. These systems enhance therapeutic efficacy by improving drug solubility, prolonging circulation time, and minimizing adverse effects. Additionally, we will discuss the role of pharmacogenomics in designing personalized treatment plans, ensuring that drug formulations align with a patient's genetic profile for maximum effectiveness.

A key focus will be on the clinical applications of personalized drug delivery in oncology, neurology, and metabolic disorders, where targeted therapies have shown significant success. Emerging technologies, such as CRISPR-based gene editing and AI-driven drug formulation, are revolutionizing the field by predicting patient responses and optimizing dosage regimens. Furthermore, the talk will address challenges in regulatory approval, scalability, and ethical considerations in implementing personalized drug delivery systems in mainstream healthcare.

The integration of personalized medicine with advanced drug delivery technologies represents a paradigm shift in therapeutic interventions, promising improved patient outcomes, reduced side effects, and enhanced treatment efficiency. This discussion aims to highlight the ongoing research, current applications, and future prospects of personalized drug delivery systems, ultimately contributing to a more patient-centric healthcare approach.

Keywords: Personalized Medicine, Targeted Drug Delivery, Nanotechnology, Pharmacogenomics, Precision Therapy, Smart Drug Carriers.

Biography

Dr. Monica Arora is a Dedicated Academic with extensive expertise in Pharmaceutical Chemistry, Drug Design, and Sustainable Chemistry. She holds a Ph.D. in Pharmaceutical Chemistry and has mentored numerous Graduate and postgraduate students. Currently serving as an Assistant Professor at Villa College, Maldives, she has previously held key academic positions at esteemed institutions in India. Her research focuses on computational Drug Design, the synthesis of bioactive compounds, and Green Chemistry. Dr. Arora has actively contributed to research grants, publications, and academic conferences, making significant advancements in Pharmaceutical Sciences and education.

Natassa Pippa

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Morphological versatility of hybrid systems: Mimicking the self-assembly of natural structures

The morphology of nanosystems is one of the Critical Quality Attributes (CQAs) of the nanoformulations, affecting the interactions of cellular membranes as well as the release of the encapsulated active substances. Hybrid systems are mixed systems composed of different in-nature materials, i.e., lipids-polymers, polymers/surfactants, and polymers/Cyclodextrines (CDs). In this presentation, different examples from the literature of our team will be analyzed in terms of the different morphological characteristics of the prepared nanostructures. Cryogenic Transmission Electron Microscopy (cryo-TEM) measurements are used for the morphological characterization of the systems prepared by the thin-film hydration method [1,2]. Phospholipids/random copolymers are self-assembled into pentagonal-or hexagonal-shaped vesicles due to the distribution of the polymeric guest into the lipid membrane [1]. Threadlike, irregular, and spherical nanoparticles are fabricated from block copolymers and CDs in the presence of the Tween 80® [2]. The size and the thermotropic behavior of these hybrid nanoparticles are in line with the cryo-TEM images [1,2]. The morphological versatility of the prepared systems is responsible for the loading efficiencies of the active substances as well as their release profile. In conclusion, mimicking the self-assembly of the natural structures by using hybrid systems would be beneficial for the design and the development of drug delivery systems.

Biography

Natassa Pippa (Pharmacist, MSc, PhD) is Assistant Professor in the Department of Pharmaceutical Technology, National and Kapodistrian University of Athens. Her research is focused on pharmaceutical technology and specifically the design and development of nanoparticles (liposomes, micelles, hydrogels, etc.) for the delivery and targeting drugs. Has published more than 120 scientific papers in peer- reviewed journals (Scopus h-index 25; Google Scholar h-index 26), 15 chapters in scientific books, and is the editor of five scientific books. Natassa Pippa has been selected as a speaker at national and international conferences and has presented more than 120 published presentations (oral/poster).

Neha Agarwal

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Acetaminophen-over the counter drug: Applications and safety concerns

Pharmaceuticals have undoubtedly lengthened life spans, cured millions from deadly diseases, and made life comfortable and free from pain. This very success has now led to their emergence as rapidly growing environmental pollutants and contaminants. Acetaminophen (4'-hudroxyacetanilide, or N-acetyl-p-aminophenol) commonly known as paracetamol, is amongst the most popular pain killers and widely used analgesic and antipyretic drug which is used for relieving pain and fever as a non-prescription drug, worldwide. Such huge consumption all over the world can be expected to result in the contamination of the environment and threat to human health. Its presence has been found in the environment which has been detected drinking water, waste water and sewage treatment plant effluents.

Although chemical oxidation process is done for the treatment of waste water to remove acetaminophen but severe reaction conditions, production of secondary pollutants as by products and huge operational expenses associated, leave no choice but to find other methods of treatment. Biodegradation of pharmaceuticals by microorganisms is now being considered as an environment friendly alternative which has bearable cost. The widespread use of acetaminophen, other pharmaceutical and the scarcity of parallel and safe alternatives, its impact on the environment and on human health deserves further attention. The main aim is developing comprehensive understanding on the percolation of paracetamol in environment through uncontrolled usage its toxic effects and proposed metabolic pathways of its sustainable degradation.

Keywords: *Acetaminophen; Rational Usage, Behavioural Disorders; Biodegradation; Aquatic Environment.*

Biography

Dr. Neha Agarwal had been awarded Ph.D. in Chemistry at the University of Lucknow, Lucknow, India, in 2017 and qualified UGC-CSIR-NET Chemical science in 2013. Then joined the Navyug Kanya Mahavidyalaya, a leading women's college; associated with the University of Lucknow in 2019. Dr. Neha is presently giving her services as the Head of Department of Chemistry in Navyug Kanya Mahavidyalaya as a permanent faculty. She had published many research papers on the mechanism of oxidation of Pharmaceuticals in journals of National and International repute. Dr. Neha is an active member in the field of chemical science and an editorial board member of World Journal of Pharmaceutical Research (ISSN 2277-7105), and Pharmaceutical Drug Regulatory Affairs Journal (ISSN-2642-6315) open access, peer reviewed international journal of high repute. She is an active member of SNIC (Singapore), ACT, CRSI (India).

Dr. Nilay Solanki

Charotar University of Science and Technology, CHARUSAT Campus, India

Mechanistic insights into phlorizin's multi-target potential in alzheimer's disease: A network pharmacological and in-vivo study

This study investigated the therapeutic potential of phlorizin for Alzheimer's Disease (AD) using an integrated computational and experimental pharmacology approach. The research aimed to determine how phlorizin modulates key AD biomarkers, including AChE, Bcl-2, caspase-3, and GSH.

The initial computational phase involved using several databases and tools to predict and analyze phlorizin's interactions. DisGeNET and SwissTargetPrediction identified a strong association between phlorizin's predicted targets and AD, with important proteins like TNF, AKT1, AChE, Bcl-2, and caspase-3 being highlighted. Gene ontology enrichment analysis confirmed the compound's potential involvement in amyloid-beta clearance, regulation of neuron death, and oxidative stress responses. Molecular docking and subsequent molecular dynamics simulations demonstrated that phlorizin forms stable and favorable bindings with AChE, Bcl-2, and caspase-3.

Experimentally, AD was induced in male Wistar rats with Aluminum Chloride (AlCl3). Phlorizin treatment in these rats significantly alleviated AD-like symptoms. Behavioral tests showed marked improvements in cognition, while biochemical analysis confirmed the neuroprotective effects. Phlorizin successfully restored levels of GSH and AChE, and it modulated apoptosis by upregulating the anti-apoptotic protein Bcl-2 and downregulating the pro-apoptotic protein caspase-3.

In conclusion, phlorizin demonstrated significant neuroprotective effects in AD models by improving cognitive function, reducing oxidative stress, and modulating apoptosis-related biomarkers, validating its potential as a therapeutic agent.

Biography

Dr. Nilay Solanki is an Associate Professor at Ramanbhai Patel College of Pharmacy, CHARUSAT Campus, India. He had completed his Ph.D. in 2016 from CHARUSAT University and his post-graduation in 2007 from LMCP, Gujarat University. Dr. Nilay has over 16 years of academic, research, administrative and leadership experience in the field of Pharmacology. His expertise is in the area of preclinical animal model development neurodegenerative disease, diabetes, cancer, NAFLD, obesity. Dr. Nilay has several collaborations with multispecialty hospitals in Gujarat, where major clinical studies were conducted. Dr. Nilay has published over 45 research, review papers &

book chapters in Scopus and Web of Science-listed high-impact factor journals. He has also completed multiple consultancy projects. Dr. Nilay had received various awards at national conferences and CHARUSAT research paper awards for five consecutive years. Dr. Nilay also provided his services as a resource person at national and international conferences in India. He is also associated as a reviewer and editor in national and international journals.

Nizama Hodzic Sp.M.Pharm., M.Mgt.certified in USA

Director Pharmaceutical Logistic, Bosnalijek Pharmaceutical Industry, Sarajevo Bosnia and Herzegovina

Impact and challenges supply chain reliability in pharmaceutical process development

Drug delivery systems as a technological system formulate and store drug molecules into suitable forms of medications. Effective process development plays a key role in mitigating risk, accelerating time-to-market, and significantly reducing development costs for pharmaceutical companies. Selecting appropriate raw materials, designing efficient production methods, optimizing critical process parameters are very important in risk reduction. Early identification of impact and challenges in supply chain reliability prevents costly late-stage redesigns. Material constraints necessitating cost-effective sourcing strategies and supply chain reliability for specialized ingredients have huge impact when scaling from laboratory to commercial production. Successfully navigating these challenges requires sophisticated development approaches, careful regulatory planning, strategic material sourcing, and creative engineering solutions to ensure commercial viability. By systematically addressing challenges related to scale-up, optimization, quality control, and regulatory compliance, process development creates manufacturing methods that consistently deliver high-quality medications to patients. It is important to unsure that raw materials flow uninterrupted through integrated processing steps to create finished products. Firstly, we have to know what are the realistic demand management production planning and scheduling. Product portfolios becoming more complex while regulations are becoming more stringent which rises the costs of PSC. Identification of product portfolio, long approval times, batch-to-batch variability and shortages, long lead times for scale-up, capacity constraints, adaptability to short-term demand fluctuations, quality assurance tasks lead times and very-specific products and process. Lead times raw materials get exceed. Entry of new rival products and change in the local regulatory policy can result in demand float throughout the year. The raw materials have to be procured months before the production as they are shipped from oversea suppliers. A sudden drop in demand could cause the production plan to be postponed or cancelled. As a result, excessive raw materials pile up in the warehouse. Requirements of regulatory agencies to withdraw API's from the market due to impurity and stop production. Recent changes in the operating environment mean that companies are revisiting the components of their supply chains and identifying ways of extracting additional benefits from them. In the new decade, supply chain management and analytics will be shaped by new technologies. By analyzing data from IT-enabled devices and sensors, it is possible to identify patterns and trends that can help to optimize supply chain operations. The adoption of technologies such as supply chain network design, forecasting, predictive analytics, artificial intelligence, technology, and digital

platform dashboards would help companies improve their processes, reduce efforts and cycle time, and increase profits.

Biography

Sp.M.Pharm, M.Mgt Nizama Hodzic is Experienced Director in Pharmaceutical Logistics with a robust 20- year history in the pharmaceutical industry. Specialized Master of Pharmacy and certified Master of Management in the USA, with a focus on production planning, supply chain, pharmaceutical technology, science, and business economics. Demonstrated success in large-scale production planning and warehouse management. Proficient in optimizing production planning to maximize profits and minimize costs. Possesses a valuable skill set conducive to achieving diverse goals. Expertise in team building, leadership, and quality control management. Demonstrated ability to coordinate stocks, production, and sales, forge partnerships, and collaborate effectively with teams to ensure timely and cost effective project completion. From 2004. Miss Hodzic verified her diploma in European Union. Constantly participates in public training, coaching, and speaking in all World Business Institution. Several published studies in drug development such as “Effects of physical characteristics of active ingredient on Atorvastatin calcium tablets”; European Journal of Pharmaceutical Sciences.2011 September; 44(1):80- 81.

Nurul Ain Binti Mohammad Hamdi*, Harmesh Aojula

Division of Pharmacy & Optometry, University of Manchester, Manchester, United Kingdom

Design and computational analysis of a peptide analogue with a WXXW motif: A membrane-active and reversible drug binding peptide to overcome cancer drug resistance

Membrane-active peptides are known for their ability to transport therapeutic agents across cellular membranes, thereby enhancing intracellular delivery. In this study, we designed a membrane-active peptide analogue by incorporating a drug-binding sequence. This modification aims to improve the binding affinity for doxorubicin while retaining membrane activity. Doxorubicin, a widely used chemotherapeutic agent, often encounters limitations such as multidrug resistance and off-target toxicity. Enhancing the interaction between the peptide analogue and doxorubicin may result in a more effective delivery platform that leverages both membrane activity and drug-binding capability. To investigate the binding dynamics of the drug-peptide complex, blind molecular docking and molecular dynamics simulations were performed in aqueous solution at room temperature. Docking identified tryptophan residues W12 and W15 within a WXXW motif as key contributors to the initial binding pose. Molecular dynamics simulations further demonstrated a transition from surface-level interaction to a more embedded binding state, with the peptide wrapping around doxorubicin. Energy decomposition analysis highlighted the dominant contribution of the WXXW motif, along with W19, in mediating the interaction. These results support the rational design of membrane-active peptide analogue as a flexible and effective drug-binding peptide, emphasising its potential in targeted drug delivery strategies. Future studies may explore the integration of the WXXW motif into peptides tailored for specific molecular targets, offering innovative avenues in drug delivery and design.

- How to rationally design membrane-active peptides for targeted drug delivery using structural modifications (e.g., WXXW motif).
- The role of computational tools like blind docking and molecular dynamics simulation in predicting and validating peptide-drug interactions.
- Mechanistic insight into drug intercalation involving key tryptophan residues (W12, W15, W19).
- Strategies to overcome cancer drug resistance through enhanced intracellular retention of chemotherapeutics.

- Application of residue energy decomposition analysis to identify drug-binding residues within peptides.

- This knowledge enables researchers to design more effective peptide-based carriers for drug delivery, especially in resistant cancer models. It is directly applicable for faculty in computational biology, medicinal chemistry, and pharmacy teaching or research. The methodology also improves accuracy and efficiency in drug delivery system design by reducing experimental trial-and-error through pre-validation of interactions computationally

Biography

Nurul Ain is a registered pharmacist and a final-year PhD candidate at the University of Manchester, specializing in drug delivery systems. Her current research focuses on the design of membrane-active peptides for targeted anticancer therapy. During her master's study, she published three papers as the primary author, including work on nanoparticle formulations for oral cancer treatment and gel formulations for oral cancer applications.

Dr Parikshit Shirode[1*], Dr Hemant Toshikhane[2]

[1]Ph.D. Scholar and Professor, Dept of Shalya Tantra, Parul Institute of Ayurved, Parul University, Vadodara, Gujarat, India

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Development, pharmaceutical analysis and in-vitro evaluation of modified herbal fumigation formulations

Ayurveda is science of the life. Maintenance of the health of healthy individuals and treatment of the diseased are the main principles of *Ayurveda* management. *Acharya Sushruta*. The Father of Surgery, explained different types of surgeries and documented procedures in a sophisticated manner. He also explained different types of instruments, dressing techniques and other perioperative procedures. He clearly emphasized the importance of asepsis in his words *Rakshakarma*. He enlisted various drugs for it. *Rakshakarma* includes various karma (procedures) and *dhoopan* is an important procedure among them. In the modern era, sterilization and disinfection are the main weapons to deal with the different microbes present in the environment. The incidence of nosocomial infections increasing day by day, thus keeping the environment and surfaces microbe-free is imperative. An operation theatre is the heart of any surgical hospital and hence its sterilization is of utmost importance. Along with the operation theatre complex, fumigation of in-patient and out-patient wards is also necessary. In *Ayurveda, Vranitaagar Dhoopan* i.e. herbal fumigation of wards is explained by the scholars. Different *Ayurvedic* herbal, mineral and animal-origin drugs are explained by the experts for *Dhoopan.* To evaluate the efficacy of *Vranitaagar Dhoopan*, many researchers are taking efforts and few studies are already completed with promising results. Formaldehyde is the most widely used chemical for OT complex fumigation but due to its carcinogenic, irritable properties, many safer chemicals are emerging. Still, these new chemicals are not widely accepted by the healthcare units in developing countries due to their high cost. Formalin is not preferred for routine fumigation of wards. This article gives the gist of attempts made by the authors to modify the herbal fumigation formulations to make ward fumigation effective and safe.

Keywords: *Dhoopan*, Herbal fumigation, Formaldehyde, *Rakshakarma*

Biography

Dr Parikshit Shirode, an eminent surgeon from Ayurveda fraternity, completed his graduation as BAMS followed by M.S. in Shalya Tantra (General Surgery) from S.G.B. Amaravati University, India. He has clinical experience of 21 years and teaching experience of 16 years including 7 years of PG teaching till now 15 PG Scholars have submitted their dissertations under his keen guidance. He pursued his Ph.D. under the supervision of Dr Hemant Toshikhane at Parul University, India. Dr Parikshit has published 25 articles in renowned international journals. His innovative idea 'Modified Multi Needle Therapeutic Blood Lancing Device' has received Device Design patent by the Patent Authority of India.

Phanikumar Reddy Satti
Acharya Nagarjuna University, United States

Analytical methods based on liquid chromatography tandem mass spectrometry for the detection of genotoxic nitrosamine impurities

The presence of genotoxic impurities like nitrosamine in pharmaceutical products has become a pressing global safety concern due to their potential carcinogenic and mutagenic effects. NAs, particularly N-nitroso compounds, are classified as probable human carcinogens, raising the need for stringent regulatory oversight and innovative approaches to detect and mitigate their occurrence. This review highlights recent advancements in the detection, quantification, and analysis of these impurities, using liquid chromatography mass spectrometry. Her we also explore the origins and pathways of nitrosamine formation during drug synthesis, storage, and degradation, emphasizing the critical role of risk assessment and quality control in pharmaceutical manufacturing. Furthermore, we are going to discusses the evolving regulatory landscape, including the impact of stringent guidelines from agencies such as the FDA and EMA, on industry practices. By addressing these challenges and presenting solutions, this article underlines the importance of robust impurity monitoring systems to ensure the safety, efficacy, and quality of pharmaceutical products, thereby safeguarding public health.

Biography

Phani Satti, Director of Analytical Development at Veranova, L.P., has over 22 years of experience in pharmaceutical R&D, specializing in analytical method development, validation, impurity profiling, and GMP laboratory establishment. He has authored multiple peer-reviewed publications on nitrosamine impurities, stability-indicating methods, chiral separations, and nanomedicine, with his work cited internationally and influencing scientific practice and regulatory approaches. Phani is currently pursuing a Ph.D. in Analytical Chemistry and is committed to mentoring scientists, fostering innovation, and driving excellence in analytical R&D to support preclinical, clinical, and commercial pharmaceutical programs.

Dr Prashant Bhokardankar

Professor and HOD Dept.of Rasshastra-bhaishajya Kalpana, Datta Meghe Ayurvedic Medical College Hospital and Research Centre Nagpur M.S. India

Ayurvedic bhasmas as a nano medicines for the human kind

Mineral and metallic nanomedicines are a precious resource found in the Ayurvedic medical system. Rasashastra is an Ayurvedic branch that deals with the preparation and therapeutic use of nanomedicines. A weak interdisciplinary collaboration between science and Ayurveda ultimately arose from the Indian scientific community's poor scientific judgment of Ayurvedic principles. The current discovery is to think about using Ayurveda effectively by having a deeper understanding of its principles. Luckily, some in the new genre have been moved to see this fact and take a stance as translators, communicating in a language that both parties can comprehend and reestablishing the connection between Ayurveda and science without sacrificing its unique flavour. Nanometers measure the particle size of the bhasma kind of medication, which is described in Ayurvedic texts. The paper highlighted bhasma as a nano medicines for upcoming generations as drugs.

Biography

Dr Prashant Bhokardankar is BAMS. He did his MD ayurveda in Rasshastra from Govt. Ayurveda college Nanded India in 2005. He started his career as a Lecture in Dept. of Rasshastra-Bk at siddhakala Ayurved college Sangamner. After That he served various pharma companies like Dabur and Arya Vaidya Pharamcy coimbatore. Currently, Dr Prashant is working as a Professor at DMAMCHRC Nagpur from 2019. Dr Prashant has published various national and international research papers in indexed Journals. Dr Prashant has organized various seminar and workshops on traditional medicines so called ayurvedic medicines. He worked as Principal investigator for various funded Research projects in his tenure. He has vast experience in Ayurveda Pharma sector.

Preeti Sharma*, Pradeep Kumar

Department of Biochemistry, Autonomous State Medical College, Fatehpur, UP, India

Study of serum adiponectin and hsCRP in diabetic patients

Adiponectin, a major cytokine from adipose tissue and hsCRP, a well established marker of inflammation are known to be associated with increased risk of Cardiovascular Disorders (CVD), when levels fluctuate from the normal levels in the blood.

Aims and Objective: The aim of our study was to evaluate the levels of these parameters and determine their correlation with glycemia in order to assess the cardiovascular risks in the patients with type 2 diabetes mellitus.

Materials and Methods: The study was conducted in the department of Biochemistry, Santosh Medical college, Ghaziabad with 25 type 2 diabetic patients and 25 age and sex matched controls. Ethical clearance from the institution and informed consent from the patients were taken prior the study. Adiponectin was analysed by ELISA and blood sugar and CRP were estimated by kit based method.

Results: Fasting blood sugar (FBS, 158.2±37.2) and hsCRP (3.97±1.54) were significantly high, adiponectin was significantly low in the patients with diabetes compared to controls (80.52±9.72, 1.27±0.75 and 10.78±1.69 respectively, $p<0.05$). Adiponectin showed negative correlation with FBS ($r=-0.427$) and hsCRP ($r=-0.336$) but the correlation was significant only in case of FBS ($p<0.05$). hsCRP positively correlated with FBS ($r=0.568$) and was statistically significant.

Conclusion: The results of our study further support the role of adiponectin and hsCRP as predictive biomarker of CVD risks in the patients suffering from type 2 diabetes.

Keywords: Adiponectin, hsCRP, Diabetes Mellitus, Cardiovascular Disease

Biography

Motivating and talented Biochemistry Professor, driven to inspire students to pursue academic and personal excellence. Exceptional track record of research success with multiple published articles. Dr. Preeti Sharma is currently working at Autonomous State Medical College, Fatehpur, UP, 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 140 publications with high citation and few in phase of communication. She also wrote 2 books, and guided and coguided many MD and Ph.D students. 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. She is awarded with many international and National Scientific Awards for exceptional contribution to research & teaching.

Punam Kumari

Pharmacovigilance Consultant, Clinexel, United Kingdom

Medication errors: Detection, impact, and risk reduction through pharmacovigilance

Medication errors are a leading cause of preventable harm in healthcare systems worldwide, with significant implications for patient safety and therapeutic outcomes. Within the European Union (EU), addressing medication errors has become a key priority to enhance public health and ensure safe use of medicines. To support this goal, the European Medicines Agency (EMA), in collaboration with national competent authorities, developed the EU Good Practice Guide on Medication Errors. This guide offers a comprehensive framework for identifying, reporting, evaluating, and preventing medication errors within the EU pharmacovigilance system.

This presentation will delve into the essential elements of the Good Practice Guide, including its definitions, classification of errors, the role of risk minimisation measures, and integration with adverse event reporting systems. Emphasis will be placed on the distinction between medication errors and adverse drug reactions, and on how marketing authorisation holders and healthcare professionals should manage such events in compliance with EU regulatory requirements. Case studies and real-world scenarios will be presented to illustrate how proactive error identification and reporting can prevent recurrence and reduce patient harm. Furthermore, the broader impact of medication errors—ranging from patient trust and treatment outcomes to regulatory action and healthcare costs—will be examined.

By fostering awareness and promoting consistent practices, the Guide aims to support a culture of safety and continuous improvement in medication use. This presentation will equip attendees with the practical insights needed to align with regulatory expectations and contribute effectively to medication error prevention efforts.

Biography

Punam Kumari is a Pharmacovigilance Consultant at Clinexel. She is a Postgraduate in Pharmacology and Drug Discovery from Coventry University, UK. Based in the UK, she has 10+ years of experience in the pharmacovigilance field, having worked with leading companies such as TCS and GSK. Her expertise includes case processing, quality control, aggregate report writing, signal detection, and risk management, and also served as a Subject Matter Expert. Additionally, Punam is an ISO-certified auditor and has delivered guest lectures at various universities and institutions.

Raja Chakraverty

Department of Critical Care Medicine, Institute of Post Graduate Medical Education and Research, Kolkata, India

Nanoparticle mediated drug delivery system in cerebrovascular disorders

In the realm of cerebrovascular incidents, the safeguarding of cerebral vasculature is recognized as a paramount goal. This talk will focus on the recent advances made in the domain of nanoparticle mediated drug delivery systems for cerebrovascular disorders. Worldwide in our efforts to ameliorate the central nervous system pathologies, a variety of free therapeutic agents including peptides, proteins, genetic material, and antisense oligonucleotides have been synthesized by research groups. Nevertheless, the therapeutic efficacy of a substantial number of these agents has been hindered by their undesirable characteristics upon in vivo administration. Factors such as suboptimal stability in biological fluids, swift enzymatic degradation, insufficient release kinetics, and adverse pharmacokinetic profiles contribute to the likelihood that these agents may fail to exhibit clinical effectiveness. To address these challenges, there is an increasing emphasis on the innovation of nanoscale carriers capable of protecting and targeting drug molecules that are otherwise ineffectual when administered in isolation. Such phenomena may catalyze the translocation of inflammatory cells towards the cerebral parenchyma, resulting in oxidative stress and edema, thereby provoking a secondary reperfusion injury downstream. Even in instances where thrombolysis is achieved, the consequences of reperfusion injury encompass an inflammatory cascade analogous to the alterations seen in ischemic tissue. In addition to the repercussions of reperfusion injury, the hemorrhagic transformation associated with ischemic stroke represents another potential early outcome, which may occur either spontaneously or after the application of recanalization therapy. In these contexts, the subsequent pathophysiological mechanisms intersect with those observed in parenchymal hemorrhagic stroke. Consequently, the urgent necessity lies in the advancement of a robust combination therapy for stroke, one that not only enhances thrombolytic activity but also alleviates the ramifications of secondary ischemia or reperfusion injury.

Biography

Dr. Raja Chakraverty serves as an ICMR Scientist co-ordinating research on Antimicrobial Resistance and based at the Department of Critical Care Medicine at IPGME&R, Kolkata. He is a well-known biomedical scientist who studied Pharmaceutical Technology at the UG, PG and Doctoral level. He has 11 years of rich teaching and research experience. Dr. Chakraverty has been awarded many accolades for Best Paper awards at National Seminars and has travelled to countries for academic discourses and invited orations. Dr. Chakraverty is a prolific writer who has published around 60 high impact articles in indexed journals and several book chapters and one book. Dr. Chakraverty is also a leading Editor for various journals. He is also a life member of the Indian Pharmacological Society.

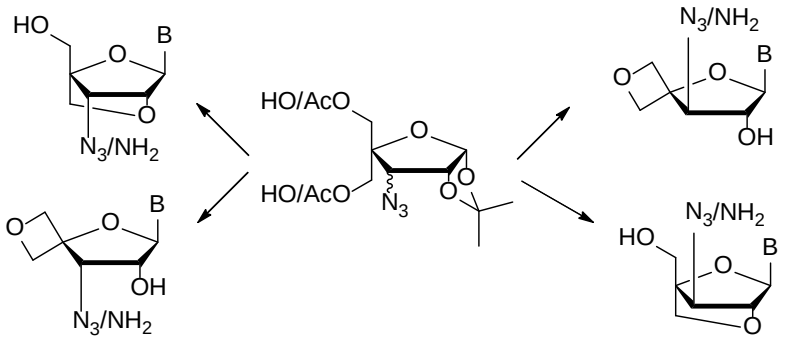
Dr. Rajesh Kumar

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

Chemo-enzymatic synthesis of bridged nucleosides

Over two decades, a large number of nucleosides have been synthesized, which demonstrated potent antiviral and anti-tumour 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 moiety 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)

Biography

Dr. Rajesh Kumar received his Master of Science degree in Chemistry from University of Delhi in 2010. He joined the same department for a Ph.D. 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. Dr. Rajesh has published more than 45 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.

Rassa Pegahi

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Pharmacology of chlorphenamine and pseudoephedrine use in the common cold

The common cold is the most frequent upper respiratory viral infection. Although benign, it represents a high socioeconomic burden. Many over-the-counter drugs are available to manage the symptoms of this condition, with antihistamines and vasoconstrictors being the most widely used. This review aimed to compare the potential mechanisms underlying the efficacy and safety of chlorphenamine and pseudoephedrine, the most commonly used agents in these two classes of drugs and provide a useful perspective to impact appropriate decisions when considering these options for symptomatic common cold treatment.

To conduct a comprehensive analysis, we systematically reviewed the use of pseudoephedrine and chlorphenamine using various databases, including MEDLINE, Google Scholar, Scopus, and Embase. We also perused the bibliographies of relevant articles and the Eudra Vigilance database.

The findings suggest that pseudoephedrine may offer specific benefits in rapidly alleviating nasal congestion in the short term. Chlorphenamine appears to exhibit a higher degree of efficacy in alleviating rhinorrhea and other specific cold symptoms compared to pseudoephedrine.

Pharmacovigilance data and case report reviews showed that pseudoephedrine may induce a higher incidence of less common but potentially life-threatening adverse effects compared to chlorphenamine.

We concluded that antihistamine drugs exhibit a more favorable benefit/risk profile than vasoconstrictors for treating symptomatic common colds.

Biography

Rassa Pegahi earned a Ph.D. in Molecular Biology and brings several years of hands-on experience in oncology from a hospital environment. Currently, Dr. Pegahi is pursuing her career in the pharmaceutical industry as a specialist in medical affairs & clinical trials.

Rassa Pegahi

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Is paracetamol (acetaminophen) still a first line option for pain and fever in paediatrics?

Background and Aim: Effective analgesia and fever management in children from birth remain crucial. This study aims to provide updated insights into the use of paracetamol in pediatric care.

Methods: A comprehensive bibliographic search was conducted, focusing on clinical studies, reviews, and meta-analyses regarding the analgesic and antipyretic effects of paracetamol in children.

Safety information is based on well-known safety data for paracetamol, recent studies and meta-analyses as well as authorities recommendations.

Results: The analgesic efficacy of paracetamol at a dosage of 15 mg/kg was demonstrated in conditions such as headaches, migraines, traumatic pain, ENT conditions, and post-operative pain following dental extraction. Due to its central COX independent antinociceptive action, paracetamol could be preferred to NSAID for mild-to- moderate acute pain. Its antipyretic efficacy was also demonstrated in several studies. Overall, Paracetamol is safe in children, and undesirable effects at therapeutic doses are rare.

Conclusions: Paracetamol has demonstrated a favorable efficacy and safety profile from birth for both analgesia and antipyresis. It is recommended as the first-line treatment for fever and mild to moderate pain by leading scientific societies.

Biography

Dr. Rassa Pegahi holds a Ph.D. in Molecular and Cell Biology and has gained extensive experience in oncology through years of hands-on work in a hospital setting. Since 2012, Dr. Rassa has been developing strong expertise in the pharmaceutical industry and is currently pursuing her career as a senior specialist in medical affairs and clinical trials.

Mariam K. Alamoudi[1], Abdulmonem A. Alsaleh[2], Anita Thyagarajan[3], Faisal K. Alkholifi[1], Muhammad Liaquat Raza[4,5], Ravi P. Sahu[3]*

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Impact of histone deacetylase isoform on the effectiveness of immune checkpoint therapy

While multiple therapeutic options exist for melanoma, their overall responses in the majority of patients remain relatively low due to the interference of counter-regulatory mechanisms. This indicates the need to understand the underlying mechanisms and devise alternative approaches to enhance the effectiveness of melanoma therapies. Given that negative immune checkpoint (IC) molecules employ tolerance mechanisms to induce tumor immune evasion and to avoid antitumor immune responses, immune checkpoint inhibitors (ICIs) have been extensively explored for the treatment of melanoma. While initial promising antitumor responses are documented, often tumor cells develop resistance to ICIs, indicating the interference due to counter-regulatory mechanisms. We utilized genomic databases to determine the underlying mechanisms involved in decreased efficacy of ICIs. Our analyses identified increased expression of histone deacetylase 4 (HDAC4) and decreased expression of T-cell inflamed tumor microenvironment (TME) gene signatures in a cohort of melanoma patients. Further studies indicate that high HDAC4 was associated with poor prognosis and decreased immune score in ICI-treated melanoma patients. While other studies are warranted to validate the findings, these studies indicate that HDAC4 could be targeted to overcome the resistance mechanisms and improve ICI efficacy.

Biography

Dr. Ravi P. Sahu earned his Ph.D. from the Sanjay Gandhi Post Graduate Institute of Medical Sciences, India. He then pursued his postdoctoral studies from 3 different universities, including Indiana University School of Medicine, Indianapolis. He is an Associate Professor in the Department of Pharmacology & Toxicology at Boonshoft School of Medicine, Wright State University in Dayton, Ohio. His lab is focused on determining the mechanisms by which oxidized lipids, platelet-activating factor (PAF) agonists impact cancer growth and therapeutic efficacy. He has published over 80 articles and serves as an Editorial Board Member and Reviewer for several scientific journals.

Roman Lysiuk[1*], Yurii Kushta[2]

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Aloe leaf juice as a basis for antiseptic-enhanced wound healing agents in wartime

In wartime, the need for effective wound healing, anti-inflammatory and antibacterial agents becomes particularly urgent. Herbal remedies are of special interest due to their affordability, broad pharmacological profile, and suitability for extemporaneous preparation. Among them, *Aloe arborescens*, widely cultivated as an indoor plant, have attracted significant attention due to its wound healing, regenerative, anti-inflammatory, antiseptic, antibacterial and antiviral properties, making it highly valuable for topical application.

To enhance antimicrobial effectiveness and broaden therapeutic potential, a novel combined preparation was developed by supplementing Krantz Aloe juice, a source of several medicines, registered currently in Ukraine, with povidone iodine, a broad-spectrum antiseptic effective against bacteria, fungi, viruses, spores, and protozoa, without risk of antimicrobial resistance or cross-resistance. The juice form was chosen for its ease of preparation, preservation of the natural phytocomplex, and suitability for topical delivery.

The resulting formulation provides synergistic wound healing, anti-inflammatory, and antiseptic effects. It is proposed for external use in the form of irrigations, wet compresses, or bandages for wounds, burns, trophic ulcers, pressure sores, and other skin lesions. Combining plant juice with conventional antiseptics offers a practical and resource-efficient strategy for developing innovative wound healing agents. Aloe-based phytopharmaceuticals, particularly in combination with povidone iodine, represent a promising direction for expanding effective topical therapies, especially under conditions of limited resources and urgent medical needs. This approach provides a scientific and practical basis for the development of novel phytopharmaceuticals for topical application, combining the regenerative properties of Aloe leaf juice with the antiseptic strength of povidone iodine.

The obtained formulation may serve as a foundation for further preclinical and clinical studies, optimization of dosage forms, and elaboration of draft quality control methods for herbal substances derived from Aloe.

Biography

Dr. Roman Lysiuk studied Pharmacy at Danylo Halytsky Lviv National Medical University, Lviv, Ukraine, where he received his MS degree in 2000. He then joined the Department of Pharmacognosy and Botany at the same institution and obtained his PhD in 2021. In 2025 he became an Associate Professor. Roman Lysiuk is also a Director of the Council for Nutritional and Environmental Medicine (CONEM), Norway. His research focuses on pharmacognosy, phytochemistry, and medicinal plants, particularly those for the treatment of civilization diseases. Dr. Lysiuk has authored over 190 publications on natural products, phytotherapy, and pharmacology of herbal substances.

Rose Stiffin

Chair, United States

Green chemistry, honey-based synthesis of silver nanoparticles and the evaluation of their antibacterial activities

Silver Nitrate ($AgNO_3$) nanoparticles have gained significant attention for their antimicrobial and anticancer properties. This study presents a green, sustainable, and cost-effective method for synthesizing $AgNO_3$ nanoparticles via a honey-mediated technique, where the natural sugars and organic compounds in honey act as capping and reducing agents. The physical characterization of the $AgNO_3$ nanoparticles was attempted using SEM. However, the results were inconclusive as to size and morphology of the nps. These honey-synthesized $AgNO_3$ nanoparticles show strong potential as eco-friendly antimicrobials and their efficacy is honey dependent.

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Isolation and evaluation of antioxidant and cytotoxic activity of 2',4'-dihydroxy-3',5'-dimethyl-6'-methoxychalcone from the ethyl acetate extract of the leaves of *Syzygium balsameum* (Wight) Wall. ex Walp

Syzygium balsameum Wight is shrubs or trees of the Myrtaceae family. The present study reports on the based-on and isolation of a flavonoid 2',4'-dihydroxy-3',5'-dimethyl-6'-methoxychalconefrom the leaves of *Syzygium balsameum* and evaluation of the antioxidant and cytotoxic property. The compound is characterized by the spectroscopic analysis UV, IR, EIMS, 1H, 13CNMR, COSY, HMBC, and HSQC. The compound2',4'-dihydroxy-3',5'-dimethyl-6'-methoxychalcone is first time isolated from the *Syzygium balsameum* wight and exhibited good antioxidant and cytotoxic property compare to the extract and the standard.

Keywords: *Syzygium balsameum*, Myrtaceae, flavonoids 2',4'-dihydroxy-3',5'-dimethyl-6'-methoxychalcone, antioxidant, cytotoxic.

Biography

Dr. Rozina Parul studied Pharmacy at the Jahangirnagar University, Bangladesh and graduated MS in 2005. She has joined at Department of Pharmacy of Gono University, Savar, Bangladesh as a Lecturer in 2007 and currently working as Associate Professor. She received her PhD degree in 2025 at the same institution. underlining the topic: “Exploration of Phytoconstituents and evaluation of bioactivities of *Syzygium balsameum* and *Syzygium formosum*”. She has published 16 research articles in national and international journal.

Rukiye Oztekin
Dokuz Eylul University, Turkey

Cu/N/Pd/Ni nanocomposites from wastes Printed Circuit Boards (PCBs) to remove endocring disruptors

Dibutyl phthalate and nonylphenol from endocring disruptors were removed photocatalycally with nanocomposites derivated from printed circuit board wastes. These wastes represent 3% of the total mass of waste electric and electronic equipment and have revealed the following composition: 5.52 wt% C, 2.18 wt% H, 0.73 wt% N, and 7.86 wt% Br. The physicochemical properties of the nanocomposite was investigated with XRD, Raman and FTIR analysis. For maximum Dibutyl phthalate and nonylphenol yields (99% and 98%) of the optimal photocatalytic time, nanocomposite concentration and Dibutyl phthalate and nonylphenol concentrations were 12 min., 1,2 mg/l and 800 mg/l and 920 mg/l, respectively.

Keywords: Cu/N/Pd/Ni Nanocomposite, Printed Circuit Boards (PCBs), Wastes, Endocring Disruptors, Dibutyl Phthalate, Nonylphenol

Biography

Dr. Rukiye Öztekin is currently working as a Researcher at Dokuz Eylül University, Department of Environmental Engineering, İzmir/Turkey. She completed her undergraduate education at Ondokuz Mayıs University, Department of Environmental Engineering, Samsun/Turkey. [B.S. (Eng)]. She studied her master education at Dokuz Eylül University, The Graduate School of Natural and Applied Sciences, Department of Environmental Engineering, İzmir/Turkey. (MSc.). She completed her doctorate education at Dokuz Eylül University, The Graduate School of Natural and Applied Sciences, Department of Environmental Engineering, İzmir/Turkey. (Ph.D.). She completed her post-doctorate education at The Scientific and Technological Research Council of Turkey (TUBITAK) the Department of Support for Scientists (BİDEB) 2218-Domestic Postdoctoral Research Scholarship Program with a scholarship postdoctoral researcher, (Post-Dr.) at Natural (World) Sciences Program. She has many international publications.

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The promise of nanotechnology in personalized & precision medicine: Drug discovery & development being partnered with nanotechnologies via the revolution at the nanoscale

A new systems approach to subclinical, predictive and/or diseased states and wellness resulted in a new Hi Tech trend in the healthcare services, namely, Personalized and Precision Medicine (PPM).

Meanwhile, despite breakthroughs in designed-driven research that have led to an increased understanding of PPM-based disease, the translation of discoveries into therapies for patients and pre-illness persons-at-risk has not kept pace with medical need.

Biodesigners, biotechnologists and biomanufacturers are beginning to realize the promise of PPM, translating to direct benefit to patients or persons-at-risk. For instance, companion diagnostics tools and targeted therapies and biomarkers represent important stakes for BioPharma, in terms of market access, of return on investment and of image among the prescribers. Therefore, developing medicines and predictive diagnostic tools requires changes to traditional

clinical trial designs, as well as the use of innovative (adaptive) testing procedures that result in new types of data. Making the best use of those innovations and being ready to demonstrate results for regulatory bodies requires specialized knowledge that many clinical development teams do not have. The areas where companies are most likely to encounter challenges, are data analysis and workforce expertise, biomarker and diagnostic test development, and cultural awareness. Navigating those complexities and ever-evolving technologies will pass regulatory muster and provide sufficient data for a successful launch of PPM, is a huge task. Partnering and forming strategic alliances between researchers, biodesigners, clinicians, business, regulatory bodies and government can help ensure an optimal development program that leverages the Academia and industry experience and FDA's new and evolving toolkit to speed our way to getting new tools into the innovative markets.

Both PPM and nanobiotechnologies are new to medical practice, which are being integrated into diagnostic and therapeutic tools to manage an array of medical conditions. On the other hand, PPM is a novel and individualized concept that aims to customize therapeutic man-agement based on the personal attributes of the patient. Novel nanomedicines have been employed in the treatment of several diseases, which can be adapted to each patient-specific case according to their genetic profiles.

Nanotechnology is used in conjunction with advanced tools such as OMICS technologies to achieve more personalized therapeutic, diagnostic, and theranostic strategies. Clinical application of nanotheranostics would enable subclinical detection and preventive treatment of diseases. PPM has thus become an interdisciplinary challenge where nanotechnology-enabled theranostic approaches may indeed become a key driver in harmonizing the needs of the various stakeholders by allowing cost-effective delivery and monitoring of drug efficiency and safety, and close-meshed high-quality data collection.

For instance, nanoparticles and nanocarriers have been developed to overcome the limitations of free therapeutics and navigate biological barriers - systemic, microenvironmental and cellular - that are heterogeneous across patient populations and diseases. Overcoming this patient heterogeneity has also been accomplished through precision and nanodrug-based therapeutics, in which personalized interventions have enhanced therapeutic efficacy. The integration of nanotechnology into the PPM-driven healthcare industry holds immense potential for the future, whilst covering: (i) cancer treatment: (ii) diagnostic tools; (iii) tissue regeneration etc. This is the reason for developing global scientific, clinical, social, and educational projects in the area of PPM to elicit the con-tent of the new trend.

Meanwhile, it is urgently needed to discover and establish new methods or strategies to discover, to develop and to create new drugs. And with the support of nanotechnology, the solubility, absorption and targeting of traditional drugs were greatly improved by modifying and fabricating with various types of nanoparticles to some extent, though many shortages remain. For instance, candidate proteins associated with disease development and progression might provide novel targets for new targeted therapeutic agents and biomaterials, or aid the development of assays for disease biomarkers and identification of potential biomarker-target-

ligand (drug) tandems to be used for the targeting. Latest technological developments facilitate proteins to be more thoroughly screened and examined in the context of drug discovery and development.

The latter means that advancements in nanobiomedicine have played a crucial role in driving the PPM-guided revolution. With the ability to engineer and manipulate materials at the nanoscale, biodesigners have been able to develop innovative solutions for diagnostics, drug delivery, and imaging.

Biography

Sergey Suchkov was born in the City of Astrakhan, Russia, in a family of dynasty medical doctors. In 1980, graduated from Astrakhan State Medical University and was awarded with MD. In 1985, Suchkov maintained his PhD as a PhD student of the I.M. Sechenov Moscow Medical Academy and Institute of Medical Enzymology. In 2001, Suchkov maintained his Doctor Degree at the National Institute of Immunology, Russia. From 1989 through 1995, Dr Suchkov was being a Head of the Lab of Clinical Immunology, Helmholtz Eye Research Institute in Moscow. From 1995 through 2004 - a Chair of the Dept for Clinical Immunology, Moscow Clinical Research Institute (MONI-KI). In 1993-1996, Dr Suchkov was a Secretary-in-Chief of the Editorial Board, Biomedical Science, an internation-al journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK. At present, Dr Sergey Suchkov, MD, PhD, is: Director for Center of Biodesign of N.D. Zelinskii Institute for Organic Chemistry of the Russian Academy of Sciences, Moscow, Russia; Senior Scientific Advisor of China; Hong Kong Innovation International Business Association; Hong Kong R&D Director of InMedStar, Russia. He is also a member of the: Russian Academy of Natural Sciences, Moscow, Russia; New York Academy of Sciences, USA; American Chemical Society (ACS), USA; American Heart Association (AHA), USA; European Association for Medical Education (AMEE); Dundee, UK; EPMA (European Association for Prdictive, Preventive and Personalized Medicine), Brussels, EU; ARVO (American Association for Research in Vision and Ophthalmology); ISER (International Society for Eye Research) and Personalized Medicine Coalition (PMC), Washington, DC, USA.

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Antibody-proteases as translational tools of the next-step generation to be applied for biopharmacy-related and precision medical practice

High impact of Ab-proteases is valuable to monitor both clinical and subclinical courses of chronic autoimmune inflammation to predict stepwise transformations of the course, starting from the pre-illness and to prognosticate the clinical illness finally. This information would al-low to design algorithms for combinatorial (preventive, prophylactic, therapeutic and rehabil-itative) treatment, whilst developing unique tools for individually therapy for a number of dis-eases, such as a group of auto-immune diseases which holds a particular position.

Among the best-validated canonical biomarkers are autoimmunity-related ones (including antibodies/Abs) to predict and prognosticate risks of the chronification, complications and thus disabling. Abs against chemically stable analogues modelling the transition states of chemical reaction, can catalyse many different reactions, and were thus called Catalytic Abs (catAbs) or abzymes, which thus to belong to Abs with a feature of functionality.

Abs endowed with enzymatic properties including DNA- and RNA-Hydrolyzing Abs (DNA and RNA-abzymes) and Ab proteases, have been isolated from the serum of patients with different autoimmune conditions. Regarding abzymes, their phenomenal property mentioned is buried in the Fab-fragment of the Ig molecule and is appearing to sound as a functional property of the

Ab molecule. In this sense, Ab-proteases as a significant portion of the big family of abzymes represent Abs endowed with a capacity to provide targeted proteolytic effect.

The activity of Ab-proteases is registered in pre-illness persons-at-risk, and at the subclinical stages of clinical autoimmune conditions 1-2 years prior to the clinical illness. Their activity revealed significant correlation with scales of autoimmune inflammation and the disability of the patients as well.

The primary translational potential of Ab-proteases and thus of this knowledge is in the ra-tional design of new therapeutics to exploit the role of the key pathways in influencing dis-ease. Of tremendous value are Ab-proteases directly affecting remodelling of tissues with multilevel architectonics (for instance, myelin or cardiac muscle). By changing sequence specificity one may reach reduction of a density of the negative proteolytic effects within the myelin sheath and thus minimizing scales of demyelination.

Abs can be engineered to make proteins of higher affinity or smaller molecular variants that retain or change the functional properties of the original Ab. In this context, targeted Ab-mediated proteolysis could thus be applied to isolate from Ig molecules catalytic domains containing segments to exert proteolytic activity and then be used as therapeutic modifiers. Ab-based therapeutics have entered the central stage of drug discovery in focus of many biotech and biopharma companies. And as the outcome of the latest initiatives, modified recombinant Abs have been designed to be more cytotoxic to enhance effector functions (bivalent Abs), whilst integrating canonical cytotoxic and upgraded catalysing (proteolytic) features. Therefore, Ab-protease engineering would offer the ability to enhance or alter their sequence-specific activity to expand the clinical utility of the tools of the next-step generation.

Ab-proteases can be programmed and reprogrammed to suit the needs of the body metabolism, or can be designed for the development of principally new catalysts with no natural counterparts. Further studies on Ab-mediated MBP degradation and other targeted Ab-mediated proteolysis may provide biomarkers of new generations and thus a supplementary tool for assessing the disease progression and predicting disability of the patients and persons-at-risks. And the new approach is needed to secure artificial or edited Ab-proteases as unique translational probes to diagnose, to monitor, to control and to treat and rehabilitate autoimmune conditions patients at clinical stages and to prevent the disorder at subclinical stages in persons-at-risks to secure the efficacy of preventive, prophylactic and restorative manipulations.

Biography

Sergey Suchkov was born in the City of Astrakhan, Russia, in a family of dynasty medical doctors. In 1980, graduated from Astrakhan State Medical University and was awarded with MD. In 1985, Suchkov maintained his PhD as a PhD student of the I.M. Sechenov Moscow Medical Academy and Institute of Medical Enzymology. In 2001, Suchkov maintained his Doctor Degree at the National Institute of Immunology, Russia. From 1989 through 1995. Dr Suchkov was being a Head of the Lab of Clinical Immunology, Helmholtz Eye Research Institute in Moscow. From 1995 through 2004- A Chair of the Dept for Clinical Immunology, Moscow Clinical Research Institute (MONI-KI). In 1993-1996. Dr Suchkov was a Secretary-in-Chief of the Editorial Board, Biomedical Science, an internation-al journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK. At present,

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Innovations in rivastigmine delivery: Nanostructured lipid carriers encapsulated in microneedles for enhanced transdermal delivery

Rivastigmine (RHT), used in the management of alzheimer's disease, reduces acetylcholine degradation and enhances the cognitive function. Challenges in RHT delivery arise due to its limited ability to permeate the brain, short half-life, low bioavailability, and abdominal side effects. In an effort to address these challenges, we investigated the use of Nanostructured Lipid Carriers (NLCs) for transdermal delivery of RHT. To enhance the efficacy of the transdermal delivery, Microneedles (MNs) loaded with NLCs were also developed and characterized. The NLCs were prepared using the double emulsion method, incorporating Compritol ATO 888 as a solid lipid and tocopherol acetate as a liquid lipid. Different parameters were evaluated to optimize NLC properties, as solid lipid to liquid lipid ratio, sonication time, lipid phase concentration, and initial drug amount. The MNs were made-up using Polyvinyl Alcohol (PVA), at different concentrations, and the best MN formulation was subsequently loaded with the optimal NLCs dispersion. The optimal selected NLC formulations demonstrated a small size of ≤60 nm, with an entrapment efficiency reaching 53%. Additionally, the NLCs exhibited the capability to sustain RHT release for up to 7 hours. The optimal MNs, composed of 15% PVA, displayed good mechanical properties and insertion capability, and resulted in complete drug release within one hour and significant improvement in drug permeation. In summary, the successful development of MNs loaded with NLCs containing RHT highlights their capacity to release NLCs and enhance percutaneous permeation.

Biography

Professor Shereen M. Assaf, holding an MSc and a PhD from the University of Strathclyde, Glasgow, boasts over 32 years of academic expertise and nine years in administration. She has numerous publications and active roles in university and external committees. Proficient in pharmaceutical formulation and regulations, she's a consultant and committee member at the Jordanian Food and Drug Administration since 2012. Beyond her professional role, she engages in voluntary medical care and health awareness. Her research focuses on designing pharmaceutical dosage forms, specializing in microencapsulation, nanotechnology, and polymeric drug delivery systems across various administration routes.

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Cannabinoid acids for the treatment of multiple sclerosis

Penetration of immune cells into the brain, activation of glia and secretion of inflammatory mediators like cytokines and free radicals like nitric oxide (NO) play key role in Multiple Sclerosis (MS); an autoimmune disease. Phytocannabinoidshave anti-inflammatory properties. All phytocannabinoids originate from cannabigerolic acid, which is converted to tetrahydrocannabinolic Acid (THCA) and cannabidiolic Acid (CBDA). These acid derivatives contain chemical groups similar to those identified in nonsteroidal anti-inflammatory drugs. Thus, acid derivatives of phytocannabinoids may modulate neuroinflammation and MS. In the present study, we examined the effect of CBDA and THCA on NO, TNFα, and IL17A production in BV2 microglia activated by lipopolysaccharide (LPS), vs. neutral derivatives, CBD and THC. *In vivo*, we followed the clinical score in myelin oligodendrocyte glycoprotein (MOG) induced experimental autoimmune encephalomyelitis (EAE) mice model of MS. CBDA decreased LPS-induced NO production in BV2 cells. THCA also abrogated LPS-induced NO production in BV2 cells CBDA and THCA increased TNFα secretion from LPS-stimulated BV2 cells. CBDA decreased IL17A secretion, respectively. Treatment with THCA reduced IL17A production. CBDA treatment improved MS clinical score versus the MOG group in an in vivo EAE model. We have shown the potential of CBDA and THCA in the regulation of neuroinflammation *in vitro and in vivo*, it may lead to a potential therapy for neuroinflammatory diseases such as MS.

Biography

Prof. Fleisher-Berkovich studied Biochemistry and Molecular Biology at the Ben-Gurion University of the Negev, Israel and graduated as BSci in 1993. She then joined the research group of Prof. Danon in the Department of Clinical Pharmacology, Ben-Gurion University of the Negev. She received her PhD degree in 1999 at the same institution. After two years postdoctoral fellowship supervised by Dr Smith at the Biochemistry Laboratory, East Lansing, Michigan she obtained the position of an Associate Professor at the Clinical Biochemistry and Pharmacology, Ben-Gurion University. She has published more than many research articles in SCI (E) journals.

Gehan Ahmed Abdel-Hafez[1], Dagmara Kłopotowska[2], Beata Filip-Psurska[2], Ahmed S. Aboraia[3], Joanna Wietrzyk[2], Adel F. Youssef [3], Tarek Aboul-Fadl[3*]

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Novel nucleobase–2-oxindole–heterocyclic hybrids as selective cell cycle regulators with potential anticancer activities

Cancer remains a global health threat despite advances in research and technology. According to International Agency for Research on Cancer, the cancer burden will increase by about 77% by 2050, further straining health systems, people and communities. 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. In recent years, cell cycle and checkpoint pathways regulation are offering new therapeutic approaches against cancer. Targeting the cell cycle holds promise but further optimization is necessary to fully exploit it as an anti-cancer strategy across diverse malignancies. Accordingly, a novel series of small molecules integrating pyrazolo[3,4-d] pyrimidine or aminopurine cores with an oxindole moiety (6a–d–13a–d) was synthesized as potential multitarget anticancer agents. Compounds 8b and 12a–d displayed notable antiproliferative activity against A498, HepG2, and MDA-MB-231 cell lines, with IC50 values in the low micromolar range. Select compounds (6b, 7b, 8b, 12a–c) exhibited potent CDK6 inhibition (pIC50 up to 7.17), surpassing palbociclib, and VEGFR-2 inhibition comparable to sorafenib. Additionally, they demonstrated significant xanthine oxidase inhibition. Compounds 12a and 12c induced sub-G1 phase arrest and caspase-3-mediated apoptosis in HepG2 cells, supporting selective CDK6 inhibition. Docking and molecular dynamics studies confirmed stable binding to CDK6 and VEGFR-2. In silico ADMET analysis predicted favorable pharmacokinetic properties. These findings highlight 8b and 12a–c as promising multitarget anticancer leads.

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-Universität, Erlangen-Nürnberg, Germany (1999 and 2013) and University of Utah, USA (2001-2002 and 2004-2005). Prof. Tarek has over 88 publications and 4 patents that have been cited over 2399 times, and his publication H-index is 28 (google_scholar), 23(Scopus). He was awarded ACDIMA Research Award for the Best Scientific Research in Arab World, 2012. Prof. Tarek was listed in the World's 2% Top-Cited Scientists by Stanford University for three successive years (2021-2024).

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Impact of sugars on electrospray-dried peptide/protein powder formulations

Electrospray drying is an emerging technique gaining attention in the pharmaceutical industry, particularly for the formulation of biologics and nanoparticles. It enables the production of particles with controlled morphology and size through rapid solvent evaporation driven by an applied electrostatic field. Unlike conventional drying methods that rely on high temperatures, electrospray drying preserves the structural integrity of heat-sensitive peptides and proteins, making it well-suited for inhalable drug delivery systems. A recent study investigated the influence of electric fields and sugar-based excipients on protein stability during electrospray drying. The findings highlight the potential to optimize processing parameters and excipient selection to enhance the performance of protein-based formulations. This presentation highlights the potential of optimizing electrospray parameters to enhance peptide and protein delivery by achieving optimal particle morphology, particularly for drug delivery applications such as inhalable formulations.

Biography

M. Teresa Carvajal is a Faculty Member at the Agricultural and Biological Engineering at Purdue University. She worked in the pharmaceutical industry, Roche, Bayer and Transave for a total of 14 years prior to joining Purdue. M. Teresa graduated with a MS in Physical Pharmacy, from the University of Arizona, USA and with a PhD in Powder Pharmaceutical Technology at the University of Bath, UK. Tere's research group on material sciences focuses on microstructure, surface/interface interactions and energetics, and their impact on powder performance properties such as flowability, aerosolization, entrainment, during formulation, processing and manufacturing. She has authored or co-authored more than 70 peer reviewed articles.

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Biodegradable ribbon for roll porous scaffold 3D bioprinting technology

The advantages of 3D bioprinting, tissue engineering and regenerative medicine represent a powerful potential for everyone who wants to always be healthy, young or rejuvenate. Overcome the shortage of organs for implantation and personal hormone replacement therapy for everyone with the help of printed endocrine glands. Accelerate targeted therapy, personalized medicine with simultaneous testing of many methods and drugs of treatment, determining the most effective with minimal toxicity. 3D biomodels "organ on a chip" allow to replace parallel testing of new substances on animals.

It is logical that the key to rejuvenation is not in nutrition and climate, because if a grandmother, even from the Forbes list, lives with her granddaughter in the "blue zones" (the Mediterranean or Okinawa), eats the same fresh food, drinks the same water from the purest mineral springs, then the first will continue to age, and the second will flourish. Hormone replacement therapy has long proven that the best way to restore youth is to restore hormone levels. No hormonal gels, pills, injections, etc. Can compare with your own young endocrine glands, created for each person, based on his DNA and will prevent rejection. However, the current progress of bioprinting is not enough to create complex organs. These objects require precise multicellular systems with vascular integration, which is currently impossible with traditional bioprinting methods.

Modern development of technologies does not allow the production of microvessels, but only macrovessels with limited mechanical integrity. Bioprinting of small capillaries is now a difficult task, since modern patented methods can make organoids and vessels Ø>100 μm at a speed of ~ 1 cm^3/hour. The support material of the bioink must retain its shape after printing in order to obtain sufficient dimensional integrity and mechanical strength. Accordingly, the new 3D bioprinting technology, which surpasses all currently dominant indirect analogs, is very relevant. Roll porous scaffold is proposed to quickly and effectively overcome the listed difficulties without using too expensive laser-polymer gels and launching printers into space.

During the implementation of the 1st stage of the grant "fund for assistance to innovations" the following results were achieved.

1. The composition of the film material based on biocompatible high-molecular compounds was developed.
2. Film samples for laser perforation were manufactured.
3. Optimal parameters of laser perforation specifications were selected.

For the first time, dozens of multi-colored water-soluble films with the possibility of laser burning were created, films with a thickness of ~50–60 μm were made, perforated with cells of 30–160 μm.

A laboratory sample of a tape porous composite material of the following dimensions was manufactured: 100×100× (0.02–0.1) mm, 0.1–0.7 g.

Biography

Dr. Vyacheslav R. Shulunov studied physics at the Buryat State University, Russia and graduated in 1997. He then joined the research group of Prof. Semenov at the Institute of Physical Materials Science of the Siberian Branch of the Russian Academy of Science. In 2002, he received his Ph.D degree in Thermal Physics and Theoretical Heat Engineering from the East Siberia State University of Technology and Management. The author of 21 patents of the Russian Federation, 5 certificates of state registration of the program and databases, 13 Web of Science and Scopus publications (1 co-author in 2). Scopus h-index: 6. https://www.researchgate.net/profile/Vyacheslav-Shulunov/stats

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The critical role of lung safety in regulatory approval of systemic inhalation delivery products

In systemic inhalation delivery, the respiratory tract is used as a route of administration, allowing the active ingredient to enter the blood circulation directly through the alveoli. It is not for lung diseases, but for the treatment of other diseases of the body. As a potential alternative roue to intravenous administration, systemic inhalation delivery offers obvious clinical benefits. Compared with oral administration, it delivers the API into blood rapidly and avoids the first-pass effect. Compared with injection, it is non-invasive, painless, and can be self-administered. However, only four systemic inhalation delivery products have been approved so far (one withdrawn), mainly because of FDA's concerns on safety of the lungs. It is very reluctant to see patients suffer unnecessary impairment to their otherwise healthy lungs while treating other diseases.

LPI-1503, Ondansetron Inhalation Powder, is developed by LUXENA pharmaceuticals for acute treatment of nausea/vomiting. A phase I clinical trial to study pharmacokinetics and safety of LPI-1503 is recently finished.

In this presentation, the presenter will discuss the critical role of lung safety in LUXENA’s communication with FDA, review the bioavailability and lung safety data of the four approved products, and present the animal toxicology (including respiratory toxicology) and clinical pharmacokinetic and safety data (including clinical safety endpoints of pulmonary functions) of LPI-1503. It is found that, by inhalation administration of LPI-1503, ondansetron can enter into blood rapidly, efficiently and safely. In 5 minutes, the blood concentration of ondansetron reached to plateau level that comparable to Cmax of orally administrated ondansetron, while latter took more than 1 hour, The bioavailability of inhaled ondansetron is calculated to be 85.7%±5.9%, which is much higher than orally administrated ondansetron (~50%), and other systemic inhalation delivery products (<=33%). There were no changes in lung function endpoints (FEV1 and SpO2), and no IP-related adverse events.

Biography

Dr. Xiaodong Li received his PhD degree at University of Rochester, School of Medicine and Dentistry in 2007. After postdoctoral research in National Institutes of Health, he joined the multiple pharmaceutical companies, such as Hana Biosciences, NeurogesX, MAP Pharmaceuticals, and Allergan with increasing responsibilities. Dr. Li has published more than 30 peer-reviewed journal articles and conference abstracts. Dr. Xiaodong Li and Dr. Biao Lu co-founded LUXENA Pharmaceuticals, Inc. in 2013, which had since then developed multiple systemic inhalation delivery products.

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POSTER PRESENTATIONS

Sarra Abassi[1], Nadine Khadraoui[1], Behija Mlik[1], Maher Gazbar[2], Hedi Gazbar[2], Boutheina Ben Abdelmoumen Mardassi[1*]

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Spirulina platensis enriched with silver nanoparticles: A novel bioalternative against antibiotic resistance in Tunisian urogenital mycoplasma strains

The emergence of antibioresistance in bacteria has become increasingly widespread, making it one of the major health problems of the century. As with many bacteria, in mycoplasmas, particularly urogenital mycoplasmas, the emergence of resistant strains in the Tunisian population has been the subject of several studies. These latter revealed an alarming resistance and multiresistance among *Mycoplasma hominis* and *Ureaplasma* spp. strains. Hence the need to monitor the evolution of this threat and to explore potential alternatives for fighting and containing its spread. spirulina, a cyanobacterium rich in bioactive compounds, is gaining attention as a natural alternative to combat antibioresistance. Its ability to produce diverse metabolites and biosynthesize metal nanoparticles, such as silver nanoparticles, provides a promising antibacterial potential. In this context, as an alternative to conventional antibiotics, we intend to test the activity of *Spirulina platensis* on resistant urogenital mycoplasmas strains and to assess its enhancement following silver nanoparticles enrichment.

Urogenital mycoplasmas clinical strains were isolated from Tunisian patients suffering from infertility and urogenital infections. After they were cultured, their antibacterial susceptibility was determined against tetracyclines, macrolides and fluoroquinolones. The activity of spirulina enriched with silver nanoparticles (SpAg) was assessed using the microdilution method and the minimal inhibitory concentration ascertainment. Two batches of spirulina with different concentrations of silver nanoparticles (5755 ppm and 22400 ppm) in addition of the unprocessed spirulina were tested. Among the tested isolates, *M. hominis* strains were resistant to moxifloxacin, ofloxacin and tetracycline with rates of 8%, 16% and 20%, respectively. As for *Ureaplasma* spp., a high rate of resistance was observed within the three antibiotic classes, revealing 46% of multidrug resistance cases. The treatment of mycoplasma strains with spirulina with or without silver nanoparticles showed promising results. The antimycoplasmic activity of the two SpAg batches exhibited higher levels of antibacterial activity than with the unprocessed spirulina.

To date, our results highlight the efficiency of *spirulina platensis* combined to silver nanoparticles and support its use as an effective mean for combating antibioresistance in mycoplasmas.

Biography

Boutheina Ben Abdelmoumen Mardassi is a Veterinary Medical Doctor from Tunisia, a PhD in Microbiology and Immunology from the Biotechnology Research Institute of Montreal and the University of Montreal in Canada, and Professor at the Institut Pasteur of Tunis since 1998. She is in charge of research and diagnostic activities in the Mycoplasmas Laboratory at Institut Pasteur de Tunis, Tunisia. She is currently head of the Research Laboratory of Molecular Microbiology, Vaccinology and Biotechnology Development. Her research topics aimed mainly to gain further insight into the genomic of mycoplasmas, and elucidation of the genetic evolution of their antibio-resistance.

Dominic Sandell

Embry Riddle Aeronautical University, Department of Human Factors and Behavioral Neurobiology, United States

The effect of finasteride on parity rates in *Drosophila melanogaster*

Finasteride has been used to treat male pattern baldness and benign prostate hyperplasia and could potentially treat female pattern baldness and polycystic ovary syndrome. However, the drug has the unintentional side effects of erectile dysfunction and infertility. The impact on reproduction in female patients who are taking or have taken finasteride is unknown. Using drosophila melanogaster as a model, this study was designed to investigate the impact of finasteride on female fly reproduction and their offspring. The female flies in this study will be fed dosage equivalents of 0.5 mg, 1 mg, and 5 mg of finasteride, along with a control group of females who consume no finasteride. The flies will be allowed to mate after consuming their respective dose of the drug and the viable offspring will be counted over the next three days. If there are viable male offspring, they will be allowed to mate with female flies as well to determine if they are impacted by the drug. This study predicts the results will indicate the finasteride, especially at higher doses, will impact the reproductive ability of the females and their male offspring. These results will further the database that could lead to determining if finasteride could be used to treat the previously stated conditions in human females. Further analysis of the experiment will be performed by sequencing and creating RNA libraries of the groups and the mother drosophila; this will be done to identify any genetic alterations.

Biography

Mr. Dominic Sandell is an undergraduate student at Embry-Riddle Aeronautical University studying Aerospace Physiology, focusing on human physiology and pre-med. His academic goals are to get my M.D/Ph. D in Neurology, focusing on chronic pain conditions and external factors. Mr. Dominic joined the “The Effect of Finasteride on Parity Rates in Drosophila Melanogaster” project two years ago and is now assisting in leading the project in its goals of finalizing data and genetic data analysis. He has also worked on research ranging from neurological migraine projects, biochemical nano-synthesis, fatigue, and the effects of hypoxia.

Iria Naveira-Souto[1,2*], Roger Fabrega-Alsina[3,4], Jessica Malavia Muñoz[3], Anna Lagunas Targarona[4], Elisabet Rosell-Vives[5]

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The physicochemical, biopharmaceutical, and in vitro efficacy properties of diclofenac-loaded liposomes

Diclofenac-loaded liposomes were developed as a tool to treat inflammatory skin disorders. Topical administration of this molecule is a challenge that can be addressed by encapsulation into drug delivery systems. The aim of the current study was to develop, purify and optimize the process to obtain Small Unilamellar Vesicles (SUVs) of 50-100 nm liposomes drug delivery system for the local administration of diclofenac. The physicochemical properties of SUVs were characterized using Dynamic Light Scattering (DLS) to measure particle size, Z-potential, Polydispersity Index (PDI), and nanoparticle concentration, while the encapsulation efficiency (%EE) was determined using HPLC-UV analysis, with a previous separation of free diclofenac from liposomes by centrifugation with ultrafiltration units. The in vitro permeation and release profiles were investigated with vertical diffusion Franz cells. Vesicles obtained (size, 86.43±8.36 nm; polydispersity, 0.145±0.026; Z-potential, -17.93±0.42 mV) were able to encapsulate diclofenac with high yield (88.8±8.2 %). Additionally, a fluorescence quenching assay was used to demonstrate that diclofenac predominantly localizes in the external region of the lipid bilayer of SUVs, likely interacting with the polar head groups of the phospholipids. The formulation was purified by evaporation at room temperature for 72h to eliminate the ethanol. Diafiltration methods were tested, but a high diclofenac content was found in the diafiltered portion, losing part of the drug load from the liposomes. The anti-inflammatory efficacy was examined at non cytotoxic concentrations after cell inflammation induction with LPS y qPCR, showing a 70% reduction in the levels of TNF-α and CXCL1, however no reduction was found in IL6 or IL8.

Biography

Iria Naveira-Souto graduated with a B.Sc. in Biology and a B.Sc. in Chemistry from the University of a Coruña, Spain in 2021. She has a M. Sc. In Pharmaceutical and Biotechnology Industry from the University of Pompeu Fabra, Spain. She is currently working as a Technician in Pharmaceutical Innovation at Reig Jofre, where they develop small drug delivery systems, as well as research into efficacy, safety, and biodistribution of bioactives using in vivo cellular models and ex vivo skin models. She is also an Industrial PhD candidate in Biotechnology at the University of Barcelona in collaboration with Reig Jofre.

Mateusz Młynek*, Julia Macyszyn*, Marzena Kaliszewska-Kozak, Weronika Leszczyńska*, Michał Szkop

NanoSanguis, Rakowiecka 36 Street, Warsaw, Poland

Evaluating maleic anhydride derivatives as linkers for pH-sensitive drug release

Cancer remains a persistent global health challenge. Current therapeutic strategies often fall short due to the adaptive nature of tumor cells, highlighting the urgent need for innovative drug delivery approaches. Recent advances emphasize improved drug selectivity through platforms that combine active targeting ligands with stimuli-responsive release mechanisms. Among these, pH-sensitive systems are particularly promising, exploiting the characteristic acidic microenvironment of tumor tissues to trigger the cleavage of pH-labile linkers and ensure site-specific drug release in its active form.

In this study, we explored the potential of maleic anhydride derivatives as pH-sensitive linkers for drug delivery applications. Three cyclic anhydrides were selected for evaluation: cis-aconitic anhydride, 2-(2'-carboxyethyl) maleic anhydride, and 1-methyl-2-(2'-carboxyethyl) maleic anhydride. These compounds differ in the length of the aliphatic spacer between the carboxyl group and the ring, as well as in substitution patterns at the double bond. To avoid the use of cytotoxic agents, monodansylcadaverine (DCV) was employed as a fluorescent drug analogue. Its amine functionality and measurable fluorescence enabled efficient model studies of conjugation and release. Amide coupling reactions were carried out in anhydrous organic solvents, and reaction conditions were optimized with respect to base selection. Conjugate stability and pH-responsive release profiles were assessed in buffered solutions mimicking physiological and acidic tumor conditions.

As a result, we successfully synthesized a series of maleic anhydride-based conjugates and characterized their stability and hydrolysis behavior. Side-product formation was observed and attributed to either known isomerization processes or potential double bond substitution. Notably, approximately 60% of DCV was released from the 1-methyl-2-(2'-carboxyethyl) maleic anhydride conjugate at pH 4, confirming the promise of this approach for further development of pH-triggered drug delivery systems.

The presented work is a part of the project 2024/ABM/05/KPO/KPOD.07.07-IW.07-0249/24 granted by Polish Medical Research Agency.

Biography

Julia Macyszyn, PhD graduated from the Faculty of Chemistry at the University of Warsaw (Poland) in 2025. She conducted her doctoral research within a SONATA project funded by the National Science Centre, working at the Centre of New Technologies UW in the Laboratory of Biomolecular Machines. Her current employer is NanoSanguis S.A., where she is a member of PhD Michał Szkop's team. Her expertise includes the synthesis and modification of peptides and other bioactive compounds with oncological therapeutic potential, HPLC and mass spectrometry analysis, enzymatic stability testing, and hemolytic activity evaluation. She is the author and co-author of four scientific publications.

Mateusz Młynek, MSc. Eng., graduated in biotechnology from the Faculty of Chemistry at the Warsaw University of Technology (Poland). As a PhD student in Prof. Tomasz Ciach's Group (Biomedical Engineering Laboratory) he explores the field of nanomaterials as potential drug delivery systems. For the past years he participated in several scientific projects financed by EU and the Polish National Centre for Research and Development. He is now working at NanoSanguis S.A., part of the NanoGroup Company as a member of PhD Michał Szkop's team where he is exploring polysaccharide based platforms for anticancer drugs delivery.

Weronika Leszczyńska earned her MSc. in Chemistry from the University of Warsaw in 2024, with a specialization in electroanalysis and chemical electrocatalysis. Weronika has broad expertise in analytical techniques, particularly cyclic voltammetry and spectrophotometry. Since September 2024, has been working as a Junior Researcher at NanoSanguis S.A., where she contributes to the development of targeted anticancer therapies and supports laboratory research in chemical analysis and synthesis.

Marzena Kaliszewska-Kozak*, Michał Szkop*

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Liposomal formulation and quantitative HPLC analysis of random peptide mixtures for antibacterial drug development

The rising antibiotic resistance among bacterial pathogens presents a growing global health concern, necessitating the exploration of novel therapeutic approaches. One promising alternative to traditional antibiotics is the use of peptides. Random Peptide Mixtures (RPMs), characterized by their structural diversity resulting from randomized amino acid assembly, offer a potential advantage by limiting the development of bacterial resistance. These mixtures can be efficiently encapsulated in nanostructured carriers such as liposomes—biocompatible, biodegradable vesicles widely utilized in biomedical applications. Liposomal encapsulation enhances peptide stability, protects against enzymatic degradation, and can improve therapeutic efficacy while minimizing side effects.

A critical aspect of using RPMs in such systems is their accurate quantification, which was the primary focus of this study. Liposomes composed of Soy Phosphatidylcholine (SPC) were prepared using the thin-film hydration technique and used to encapsulate RPM. Due to the random structure of RPMs, standard High-Performance Liquid Chromatography (HPLC) methods are not applicable. To address this, liposomal formulations were purified and subjected to hydrochloric acid hydrolysis, releasing encapsulated peptides and breaking them down into individual amino acids. Two analytical strategies were evaluated: Fluorescence-based detection of phenylalanine, and UV detection following derivatization of phenylalanine and lysine with 2,4,6-Trinitrobenzenesulfonic acid (TNBS). Both approaches enabled reliable quantification of peptide content post-hydrolysis.

In summary, we developed and validated two HPLC-based methods for quantifying RPM content in liposomal formulations, offering useful tools for further development of peptide-based antibacterial therapies.

This work has been supported by Polish National Centre of Research & Development as a part of EuroNanoMed III project (grant number ENM3/V/33/Antineuropatho/2023).

Biography

Marzena Kaliszewska-Kozak earned her Master's degree in Nanostructure Engineering at the University of Warsaw. She was a member of the InFemto research group led by Prof. Wojciech Gadomski, focusing on perovskite synthesis and optical studies. She is a co-author of two scientific publications. Her professional experience also includes work at the Institute of Physical Chemistry of the Polish Academy of Sciences, where she synthesized gold nanoparticles, as well as at Polbionica sp. z o.o., where she developed bio-ink for a bionic

pancreas. Currently, she works at NanoSanguis S.A. as an Organic Chemist, specializing in the synthesis and analysis of therapeutic delivery systems.

Michał Szkop, PhD is a biochemist and interdisciplinary scientist specializing in (bio)analytical chemistry, biosynthetic chemistry, and drug delivery. He holds a doctorate in biological sciences (biochemistry) and has extensive experience in both academia and biotechnology. Michał Szkop trained at leading institutions including the University of Potsdam, Warsaw University of Life Sciences, and the Nencki Institute of Experimental Biology. He has held key R&D and leadership roles in biotech companies within the NanoGroup (NanoThea, NanoSanguis, NanoVelos), serving as an analytical chemist, senior researcher, and project manager in advanced therapeutic development.

Mizuho Sumitani[1*], Daisuke Nishizawa, Keiya Tsujimoto, Kazutaka Ikeda, Hiroaki Abe, Masahiko Sumitani

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Astrotactin 2 (ASTN2) as novel analgesic target candidate for cancer pain and opioid sparing: An exploratory genetic polymorphism analysis

Introduction: Cancer pain impairs not only physical functions but also social functions and roles. Neuronal protein Astrotactin 2 (ASTN2) fulfills a function to regulate the release of neuronal adhesions to the glial fiber. Genetic variability in the ASTN2 gene was reportedly associated with opioid requirements during the postsurgical periods.

Method: A total of 72 cancer pain patients rated their pain on an 11-point numerical rating scale twice before and after increasing opioid analgesics. Three Single Nucleotide Polymorphisms (SNPs) of the ASTN2 gene were investigated whether these are associated with cancer pain intensity, opioid requirements (intravenous fentanyl-equivalent doses) based on weight, and analgesic responsiveness to increased opioid analgesics. We analyzed associations among genotypes, and these phenotypes using the Kruskal-Wallis test and the post-hoc test if necessary. (i.e., $p<0.05$ was set as significance).

Result: Among the three SNPs of the ASTN2 gene, two SNPs (rs958804 and rs7858836), reported in the previous study with postoperative pain, did not demonstrate any associations with cancer pain intensity and opioid requirements. Minor allele homozygosity (n=2) of one SNP (rs10491577) was linked to more opioid requirements ($p=0.018$) and lower opioid responsiveness ($p=0.003$) than major alle homozygosity (n=54) and heterogeneity (n=16) when controlling cancer pain intensity at the comparative level among three genotypes.

Discussion: Our result preliminarily suggests that the SNP of the ASTN2 gene might be potential candidate loci for responsiveness to opioid analgesics, and astrotactin 2 might be a possible target for developing a novel analgesics and the adjuvant pharmacotherapy with opioid sparing effect. Our results should be validated in a large-scale study with a larger sample size. [Acknowledgement: AdAMS]

Biography

Dr. Mizuho Sumitani studied medicine at University of Tsukuba in Japan graduating and obtaining her MD license in 2000. She then completed her training in otorhinolaryngology, head and neck cancer oncology, and supportive and palliative care at Yokohama City University. While working as a clinical otolaryngologist, she has been investigating several types of genetic association studies on cancer pain and opioid sensitivity to improve the quality of life of cancer patients.

Dr R K Maheshwari

Ex-Professor and Head, Department of Pharmacy, Sri Govindram Seksaria Institute of Technology and Science, Indore, Madhya Pradesh, India

Eco-friendly hydrotropic technology in pharmaceutical analysis precluding the use of hazardous organic solvents

A large number of organic solvents (chloroform, hexane, methanol, dimethyl formamide, ethanol, benzene, toluene, carbon tetrachloride, methylene chloride, acetonitrile etc) are employed in various types of pharmaceutical analysis viz. HPLC, TLC, HPTLC, UV spectrophotometry, Titrimetry etc. Organic solvents are volatile. The vapours of organic solvents are inhaled by the persons involved in such analysis. Several ill effects caused by vapours of these organic solvents include neurological disorders, liver damage, renal failure, mutagenesis disorder, bad effects on vision etc. In the present lecture, it shall be clear that solubilizing properties of safe and economic solids shall be used to carry out such analysis. Aqueous solutions of safe and economic solids shall replace harmful organic solvents. Aqueous solutions of hydrotropic agents like sodium benzoate, sodium citrate, niacinamide, urea, sodium acetate, sodium salicylate etc shall be used as solvent systems to carry out such analysis without the employment of organic solvents. Mixed hydrotropic solutions are also used in place of organic solvents in pharmaceutical analysis. Hydrotropic and mixed hydrotropic solutions are cheap and harmless.

Biography

Dr R K Maheshwari completed his M Pharm in 1981 in pharmaceutics discipline. He joined as lecturer (1988), department of pharmacy, Sri Govindram Seksaria Institute of Technology and Science, Indore, Madhya Pradesh, India. Retired in 2023 as professor. PhD was completed in 2008 (topic- novel pharmaceutical applications of hydrotropic solubilization) from Devi Ahilya Vishwavidyalaya, Indore, Madhya Pradesh, India. Published papers– more than 210 in various journals. M Pharm projects guided – more than 80. Papers presented in various conferences– more than 150. Three students were under my guidance for PhD. Expert lectures (webinars-International)–16. Expert lectures in India in Faculty Development Programmes, Conferences etc – More than 450. Recipient of several prestigious awards.

Rassa Pegahi

Medical Affairs Department, UPSA, 3 rue Joseph Monier 92500 Rueil-Malmaison, France

What caffein brings to paracetamol (acetaminophen) in pain management

Background: Paracetamol is effective and safe in mild to moderate migraine attacks and episodes of Tension-Type Headache (TTH). Few data are available on the use of paracetamol combined with caffeine, the aim of which is to achieve a higher analgesic efficacy of paracetamol while lowering its dose and thus reducing the risk of side effects.

Objective: The aim of this work is to provide an overview of data on the cumulative analgesic effects of this combination and to clarify the mechanisms underlying the potentiation by caffeine of the antinociceptive effect of paracetamol in migraine and TTH.

Methods: A search was conducted in PubMed, MEDLINE, ClinicalTrials.gov and Cochrane Database from inception to March 2024 with a focus on paracetamol 1000 mg in combination with caffeine 130 mg.

Results: In preclinical studies caffeine has been shown to increase the antinociceptive effects of paracetamol with various mechanisms: Inhibition of microglial COX2 via antagonism of adenosine A2A receptors or activation of glycinergic transmission. Two pharmacokinetic studies in healthy subject have shown that caffeine increases paracetamol absorption rate and decreases paracetamol clearance. Two randomized double blind clinical studies have both demonstrated that in patients suffering from TTH, the combination offers a significant higher pain relief compared to paracetamol alone. Two other TTH clinical trials have shown that the efficacy and safety of combination was comparable to Naproxen 550 mg and Ibuprofen 400 mg. One randomized, cross-over trial has shown a comparable efficacy/safety profile of the combination vs sumatriptan 50 mg in treatment of migraine attack. No data are available on the risk of medication overuse with the combination compared to paracetamol alone.

Conclusions: Caffeine accelerates and prolongs the analgesic effect of paracetamol over time with a significant improvement of pain relief in patients with primary headaches without added safety issues.

Biography

Rassa Pegahi earned a Ph.D. in Molecular Biology and brings several years of hands-on experience in oncology from a hospital environment. Currently, Dr. Pegahi is pursuing her career in the pharmaceutical industry as a specialist in medical affairs & clinical trials.

Waleed Mohammed Al-Shaqha BPharm, MPhil., PharmD., PhD.

Pharmacolgy Department, College of Medicine/Imam Muhammed Ibn Saud Islamic University, Riyadh, Kingdom of Saudi Arabia

Enabling active pharmaceutical ingredient industry in Saudi Arabia

The local production of Active Pharmaceutical Ingredients (APIs) plays a vital role in strengthening national healthcare resilience by improving access to essential medicines and reducing dependence on imports and global supply chains. While the API industry is heavily driven by research, its growth is hindered by the lack of effective governance, insufficient support for R&D, regulatory gaps, and limited skilled workforce. These challenges create significant barriers to expanding local API manufacturing. This review explores the current pharmaceutical production landscape in Saudi Arabia, identifies key obstacles, and presents strategic solutions to enhance and diversify local API manufacturing.

Presentation Overview: The presentation will examine the current state of API production in Saudi Arabia, the challenges impacting its growth, and strategic recommendations to strengthen and expand local pharmaceutical manufacturing

Biography

Dr. Waleed Mohammed Al-Shaqha is an Associate Professor at the College of Medicine, Imam Mohammad ibn Saud Islamic University in Riyadh, Saudi Arabia. Dr. Waleed holds both a Doctor of Pharmacy (PharmD) and a PhD, reflecting his extensive expertise in the pharmaceutical field. Beyond his academic role, Dr. Al-Shaqha serves as the Chairman of the Board of Directors at CAD Middle East Pharmaceutical Industries LLC (CAD). During the COVID-19 pandemic, he also took on the responsibilities of Chief Executive Officer (CEO) to guide the company through challenging times. CAD focuses on producing Active Pharmaceutical Ingredients (APIs) for small molecules, offering a diverse range of generic medicines across various therapeutic categories. In addition to his leadership roles. Dr. Al-Shaqha has contributed significantly to pharmaceutical literature. Notably, he authored the 4th Edition of the "Saudi National Formulary (SNF)," a comprehensive medical reference published in 2009. His research interests encompass medicine, clinical pharmacology, basic pharmacology, pharmacy practice, and cardiology. His scholarly work has been widely recognized, with his publications cited over 950 times, underscoring his impact on the field. Through his multifaceted career, Dr. Al-Shaqha has made substantial contributions to both the academic and practical aspects of pharmaceutical sciences, playing a pivotal role in advancing healthcare in Saudi Arabia.

BOOK OF ABSTRACTS

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