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5th Edition of Global Conference on

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

28-30 MARCH 2022

VIRTUAL EVENT

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BOOK OF ABSTRACTS

5TH EDITION OF GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

28-30 MAR

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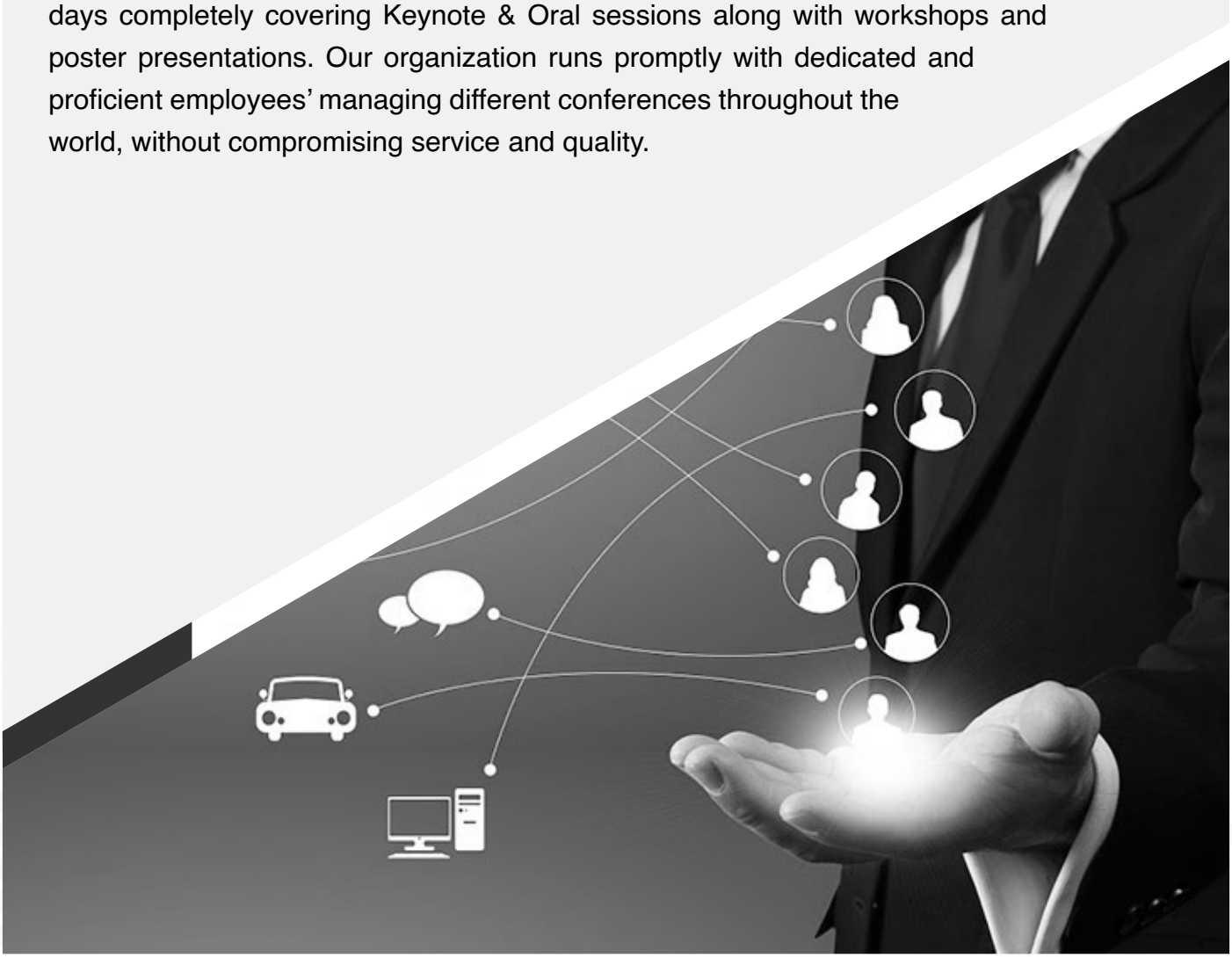
ABOUT MAGNUS GROUP

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

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



ABOUT PHARMA 2022

Pharma 2022 welcomes members from different parts of the world to join our Online Event - 5th Edition of Global Conference on Pharmaceutics and Novel Drug Delivery Systems which is going to be held Virtually during March 28-30, 2022.

The theme of the conference revolves around “Footprints of Next Generation Drug Delivery on Pharma Industry”.

This strategic conference will emphasize majorly on the need for new drug delivery systems and its types. The congress will also provide light on the major advances in the field of pharmaceutics and the hardships faced by the pharma industry during the global pandemic of COVID-19.

Pharma 2022 Conference is a multidisciplinary congress that aims to brings together people from all over the world to learn about Pharma Research and its advancements. It provides an opportunity to meet people working in the field of science and, thereby, it delights in providing an anteroom to meet the frontiers in the field of drug development, delivery and manufacture.
The three-day global summit will attract attendees from all parts of globe and will bring you worlds leading speakers discussing and disseminating their knowledge about pharmaceutics.

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KEYNOTE FORUM

DAY 01

5TH EDITION OF
GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

28-30 MAR

Bartolome Ribas Ozonas

Royal National Academy of Pharmacy, Spain

Synergism in the permeability of the blood-brain barrier of heavy elements under the influence of electromagnetic fields

The possible effects of electro magnetic fields (EMF) in the human body are explained because the external EMF, as a physic toxic agent, induced to a possible physiological and biochemical molecular effects as in the electron transfer chain in the mitochondria, synthesis by ATP-synthase, electrochemical nervous transmission, muscular contraction, cardiac myocytes electric transmission, encephalic electric transmission and other numerous electron fluxes. All of them induces to pathologies and individual hypersensitivities. It can take place releasing metal ions from numerous enzymes and metalloproteins, the 80 % of the proteins in the human body. After Einstein there is an interrelationship between mass, energy and movement.

A solenoid chamber of EMF is calibrated to exposure to 50 Hz. Determination of enzymatic activities of the electron transport chain complexes in brain of BALB/c mice exposed to a magnetic field of 50 Hz and 27.5 Gauss (2.750 mTeslas) during 1 to 4 Weeks. Experiments are performed in extracts of dissected cerebral regions hypothalamus and thalamus, and determined by spectrophotometry through kinetic colorimetric reactions.

The brain structures analyzed thalamus and hypothalamus of exposed mice 50 Hz, 2.75 mT shown a time-effect relationship at the 3rd Week. There appear marked individual higher responses for the activities of the two cytochromes (Complexes III and IV) in comparison to the control animals. This fact could show the existence of the hypersensitivity for certain animals, because only certain animals shown very high enzyme activities.

The European Parliament counselled to study the possible effects of the concurrence of chemical agents with electromagnetic fields in biomedicine. In the determination of biological effects of EMF in concurrence to environmental pollutants (heavy metals: Cd, Pb, Hg and others), show a synergism between magnetic field 0-300 MHz with Cd, Hg and Pb overload on the permeability of the blood brain barrier (BBB) and other physiological Systems. Toxic metals together with ELF-MF in mice induce to a synergism to the passage of neutral red dye to the brain. Hg, Cd and Pb induce a higher permeability to the BBB than magnetic fields. ELF-MF and heavy metals together have a synergism in the permeability of the BBB to the neutral red dye. Heavy metal ions have an affinity to the enzymatic thiolic groups. As before ELF-MF induce to vibrations and to the release of metallic ions from the enzymatic and protein molecules, bound by thyolic groups.

Biography

Born in Palma de Mallorca (Balearic Islands, Spain), Doctor In Pharmacy and extraordinary Price. License and Graduate in Medicine and Surgery by the Complutense Univ. Madrid. Ex scholarsip of frensh Government, France. Humboldt Researcher in Max Planck Institute of Biochemistry, Munich,Germany. Head Area of Toxicology, Institute of Health Carlos III; and Associated Professor, Faculty of Medicine, Complutense University Madrid. Invited Professor in Clinical Chemistry Department, Connecticut University, USA. European Unión Expert.Published more than 200 articles and more than 100 scientific communications. Introduce the courses of Neurochemistry in the Faculties of Pharmacy and Medicine, and of the Biochemical Toxicology to the Fac. of Pharmacy, Complutense University, Madrid.

Abraham Avi J. Domb

The Hebrew University of Jerusalem, Israel

Rejuvenation of old drugs by repurposing, formulation and salt formation

The introduction of a new drug entity to the clinic may take many years with a significant investment. Thus, only a few dozen of new drug entities are approved by the FDA each year. Chemical modification of existing drugs for improved properties or generating new IP, is considered a new drug entity and may require to pass a long and expensive approval process. Our approach for improving drugs that are in clinical use, without chemical modification, is by finding them a new indication that they may be effective in, reformulating them into more effective and safe formulations or preparing reversible salts of the drug molecules.

The cannabinoids, CBD and THC, are water insoluble phenolic molecules with poor oral bioavailability. Oral formulation based on the pro-nano-liposphere (PNL) concept have been prepared and showed significant increase in oral bioavailability. The formulation consists of a solid lipid, surfactants and an edible solvent that the drug is soluble in, where upon addition to gastric fluid; it spontaneously forms nanoparticles that are capable to penetrate the gastrointestinal walls and reach the blood stream. Buccal formulation that provides CBD constant blood levels for over 8 hours, after a single application was demonstrated. CBD phenolate salts were prepared for improved stability and physical properties. Injectable formulations that release an active agent for several weeks, after a single injection have been developed. These concepts can be applied to many water insoluble drugs as well as phenol containing agents for improved drug activity.

Take Away Notes:

- This seminar discusses strategies for rejuvenation of clinically used drugs by designing new formulations, repurposing and phenolate salts formation. This approach may encourage the audience to use these tools for the preparation of innovative formulations and usage of existing drugs. This is a practical approach how to introduce a new medication at an affordable cost and low risk.

Biography

Abraham J. Domb is a Professor for Medicinal Chemistry and Biopolymers at the School of Pharmacy-Faculty of Medicine and Forensic Sciences at the faculty of Law of the Hebrew University. He earned BSc degrees in Chemistry, Pharmaceutics and Law; Diplomas in Business management and Textile science and PhD from The Hebrew University. He did his postdoctoral training at Syntex Research, MIT and Harvard University. Since 1991 he is at the Hebrew university. During 2007-2012 he headed the Division of Forensic Science at the Israel Police. During 2014-2016 he served as president of College of Engineering. 2018-2021 he was the head of the School of Pharmacy of the Hebrew University. Since 2021 he is the Chief Scientist of the Ministry of Innovation, science and technology. His research interests include: medicinal and polymer chemistry, pharmaceutical development and drug delivery systems, oral and dental research and forensic science.

Consolato M. Sergi

University of Ottawa, Ontario, Canada

Pathology and patient safety: The vital role of electronic medical record and pathology informatics in error reduction and precision medicine

Electronic medical record (EMR)'s use has increased exponentially worldwide. The traditional pen and paper way to record events and data in a patient's chart has evolved to EMR, allowing numerous opportunities. There is the potential to provide higher quality and safer care for patients while creating tangible augmentations for our organizations. EHRs provide accurate, modern, and complete information about patients at the point of care, enable quick access to patient records for optimally coordinated and efficient care, share data securely, and reduce medical errors by visualizing laboratory values retro- and prospectively. In addition, they allow a safer way to prescribe drugs, connect documents with streamlined coding and billing, and enable monitoring patient safety and productivity promptly. In the 21st century, pathology is entering a new era in healthcare. Pathology is already mobilizing new resources to face the challenges posed by the Institute of Medicine and Rand Corporation's call to action for patient safety.

Implementing several modules targeting quality assurance (QA) parameters to monitor safety at pre-, analytical, and post-analytical levels is critical. The feasibility of implementing such a framework will have enormous consequences for healthcare in addressing system errors in the delivery of care. Pathology informatics can play a critical role in the prevention, identification, and correction of errors. Standardization of pathology reports, such as the College of American Pathologists (CAP) Checklist, has decreased the number of errors and misunderstandings concerning pathology findings useful for staging and therapy.

Several vendors offer CAP cancer reporting checklists as part of their current laboratory information system (LIS) solutions. Virtual pathology lab data is soon handled along with imaging and pharmaceutical data in a single EMR, emphasizing the integration, versatility, and efficiency.

Take Away Notes:

- Patient Safety and Precision Medicine Outlines
- Pathology Informatics Role in Precision Medicine
- The importance of CAP checklists for Approval of New Drugs in Pharmaceutical Sciences

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. He 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 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). He 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). He is editor in chief and in the editorial board of prestigious medical journals and international agencies.

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SPEAKERS

DAY 01

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Naseratun Nessa[1,2]*, Miyuki Kobara[1], Tetsuya Adachi[1], Toshiro Yamamoto[1], Tetsuo Nakata[2], Narisato Kanamura[1]

[1]Prefectural University of Medicine, Japan
[2]Kyoto Pharmaceutical University, Japan

Anti-inflammatory and anti-oxidative effects of Febuxostat on periodontitis Rats model

Objectives: Periodontal disease is quite prevalent and affects about 20-50% of global population. Periodontitis is a chronic inflammatory disease of the supporting structures of the teeth. When periodontal pathogens enter into the blood stream, such lifestyle diseases develop. Febuxostat, a xanthine oxidase inhibitor, exerts anti-inflammatory and antioxidant effects. This study aims to evaluate the effects of febuxostat on periodontitis in a rat model.

Methods: Wistar rats were used in this study being divided randomly into 3 groups: control, periodontitis, and febuxostat-treated periodontitis groups. Experimental periodontitis was induced by placing the ligature wire around the upper 2nd molar of the rat; the administration of febuxostat (5 mg/kg/day) was then initiated. After 4 weeks, alveolar bone loss was evaluated by micro-computed tomography and methylene blue staining. The expression of bone resorption inhibitor osteoprotegerin (OPG), in gingiva was detected by quantitative RT-PCR and immunological staining. Tartrate-resistant acid phosphatase (TRAP) staining was used to assess the number of osteoclasts in gingival tissue. Quantitative RT- PCR and immunological staining were used to examine the inflammatory cytokines expression. Oxidative stress in gingiva was also evaluated by the expression of 4-hydroxy-2-nonenal (4-HNE), and 8-hydroxy-2-deoxyguanosine (8-OHdG). In addition, blood pressure and glucose tolerance were examined to clarify the systemic effects of periodontitis.

Results: In rats with periodontitis, alveolar bone resorption increased with reductions in OPG; the number of TRAP positive osteoclasts grew. The expression of TNF-α, IL-1β, and 4-HNE, and 8-OHdG in the gingiva was up-regulated in the periodontitis group and treatment with febuxostat significantly reduced alveolar bone loss, proinflammatory cytokine levels, and oxidative stress. It also attenuated periodontitis-induced glucose intolerance and blood pressure elevation.

Conclusions: Febuxostat prevented the progression of periodontitis and associated systemic effects by suppressing proinflammatory mediators and oxidative stress.

Take Away Notes:

- Audience can know about the Periodontitis, which is a chronic inflammatory disease that results in the loss of tooth-supporting tissue and alveolar bone. Polymicrobial plaque colonization has been identified as a contributory factor to the pathogenesis of periodontitis. With the progression of periodontitis, excessive ROS produced by periodontal inflammation enter the bloodstream and increase systemic oxidative stress, which contributes to a number of systemic diseases, such as cardiovascular disease, chronic kidney disease, and diabetes. People can also know that febuxostat is extremely promising for drug repurposing in dentistry.
- People can also know about the febuxostat which is non-purine, potent XO inhibitor that is generally used to treat patients with hyperuricemia. XO inhibitors such as febuxostat have recently been attracting increasing attention due to their antioxidant and anti- inflammatory effects on a number of diseases, including ulcerative colitis, lung inflammation, and atherosclerosis. But up to now it does not used in oral disease. through this experiment audience can understand its ani-inflammatory and antioxidant effect.
- This is the research that the other research like inflammatory bone disease related faculty, could use to expand their research. Because the present study, I clearly showed that febuxostat attenuated severity of periodontitis by reducing the pro-inflammatory cytokines.

- Audience can understand its anti-oxidative effects and also know the beneficial effects of febuxostat was noninferior to another XO inhibitor with respect to major cardiovascular events. We know that FDA issued the safety alert according to higher mortality after febuxostat treatment in Cardiovascular Safety for Febuxostat with Gout and Cardiovascular Morbidities (CARES) trial. But in this experiment showed that febuxostat reduce periodontitis-related systemic disorders of BP increase and glucose intolerance by suppressingROS.

Biography

I am Dr. Naseratun Nessa studied university dental college, Bangladesh and Graduated as dentist in 2010. Then after graduation I worked in a hospital as a resident doctor from 2010-2015. Then joined the research group of Profs. Nakata at clinical pharmacology,Kyoto pharmaceutical University. I received my PhD degree in 2020 at the same university. After graduation I worked as a researcher under the supervision of Dr Tetsuya Adachi in department of dental medicine at Kyoto prefectural university. I have published 5 research articles in a reputed journal.

Mridula Prakash Menon[1]* and Kuo Feng Hua[1,2,3]

[1]National Ilan University, Taiwan
[2]China Medical University, Taiwan
[3]National Defense Medical Center, Taiwan

Nano modification of antrodia cinnamomea exhibit anti-inflammatory action and improves the migratory potential of myogenic progenitors

Skeletal myogenesis involves the formation of new skeletal muscular tissue. During an injury, the skeletal muscle stem cells known as the satellite cells get activated and undergo proliferation, migration, and differentiation to complete the process of myogenesis. Muscle wasting is an extra-intestinal manifestation of inflammatory bowel diseases (IBD) caused by impaired myogenesis. In our study, we provide evidence that beta-cyclodextrin complexation of Antrodia cinnamomea (AC) extracts results in improved proliferation and migratory potential of murine C2C12 myoblast cells in-vitro.

The solid inclusion complex (IC) formed between AC and beta-cyclodextrin by co-evaporation method was characterized using SEM, TEM, TGA/DSC, and FT-IR analysis. The size, surface charge, and dispersity index of IC were studied using zeta potential and DLS analysis. In the solution state, the formation of IC was confirmed by water solubility analysis, UV-vis spectroscopy, and fluorescent spectrophotometry. Fluorescent IC (AO-IC) was synthesized to understand the cellular uptake time and mechanism of IC by complexing it with acridine orange. The drug uptake studies performed by flow cytometry and fluorescent microscopy on C2C12 myoblasts cells showed that 60% of the drug internalization occurred within 5 min of cellular interaction of AO-IC and maximum uptake occurred within 2 h. The internalized AO-IC concentrated majorly within the cytoplasmic region of the C2C12 myoblast cells. The cellular internalization studies performed using endocytosis inhibitors demonstrated that IC uptake occurred predominantly via the pinocytosis pathway. However, a small amount of IC has also been internalized via clathrin-dependent endocytosis. The proliferation assay indicated that lower concentrations of IC enhanced the proliferation of C2C12 myoblasts cells. The in-vitro migration studies revealed that the complexation of AC with beta-cyclodextrin improved the migration potential of C2C12 myoblasts compared to that of pure drug AC in 24 h. Further investigation on the migratory protein expression indicated that IC increased the expression of N-cadherin and beta-catenin compared to the pure drug AC. RT-PCR studies revealed that IC reversed the suppressive effect of LPS on the expression of long non-coding RNAs (lncRNAs) NEAT-1 and SYISL whereas it reduced the expression of lncRNA MEG-3. In addition, IC exhibited anti-inflammatory action by significantly reducing the IL-6 expression in LPS stimulated C2C12 myoblast cells.

In conclusion, our study provides evidence that the inclusion complex formed between beta-cyclodextrin, and AC enhanced their bioavailability and stability. The interaction of IC with C2C12 myoblast cells resulted in their uptake within 5 min via pinocytosis. Once in the cytoplasm, IC increased the expression of lncRNA NEAT-1 and SYISL and reduced the expression of lncRNA MEG-3. The lncRNA NEAT-1 enhanced the migration of C2C12 myoblasts by indirectly enhancing the expression of N-cadherin and beta-catenin. This results in improved proliferation and migration of C2C12 myoblasts cells possibly by activating Wnt/beta-catenin signaling pathway. The IC also retained the anti-inflammatory property of AC by reducing the expression of IL-6 in C2C12 myoblasts cells. Hence, IC exhibits promising properties to improve skeletal myogenesis by improving the proliferation and migration of skeletal muscle progenitor cells.

Take Away Notes:

- The present study will help the researchers to understand the significance of nano drug carriers in improving the activity, stability, and bioavailability of a drug.
- The audience will be able to understand the synthesis procedures used in the study and apply them in their study
- The present study explores the molecular level influence of a nano carrier in drug delivery. This will help the audience to apply the same to understand the behavior of a particular drug better.
- Drug bioavailability is a common problem faced in the field of therapeutics. By incorporating the application of nanocarriers we can improve the bioavailability and stability of a drug which in turn enhance their efficiency. Our study provides the evidence for the same.

Biography

Mridula is a Ph.D. research student in the Department of Biotechnology and Animal Sciences at National Ilan University, Yilan, Taiwan. After completing her Master's in Biotechnology and M.Phil in Nanoscience and Technology, she joined the research group of Prof. Kuo Feng Hua in the Department of Biotechnology and Animal Sciences at National Ilan University in 2018. Her research interests include developing sustainable drug delivery formulations and to understand their influence in the biological systems at the molecular level. During her course of study, she has published many research and review articles in SCI indexed journals.

Wei Zhang
Guizhou University, China

Dendrobium nobile Lindl. Alkaloids- mediated protection against Aβ25-35-induced synaptic deficits is dependent on activation of Wnt/β-catenin pathway in rats and in cells

Synaptic degeneration, associated mitochondrial dysfunction and accumulation of amyloid-β peptide are considered as the important manifestation which leads to cognitive impairment and memory loss in Alzheimer's disease (AD)-affected brain. Avoiding the early characteristic symptoms of AD, such as synapse loss, seems to be a promising approach to prevent AD. Dendrobium nobile Lindl. alkaloids (DNLA), an active alkaloid component extracted from Chinese medicinal herb Dendrobium nobile, has a wide range of pharmacological functions including prolonging life, anti-dementia and anti-hyperglycemia effects. However, the activity of DNLA on synaptic protection and the underlying mechanism is yet unexplored. Herein, this study attempted to investigate the protective effects of DNLA on synaptic damage in Aβ25-35 toxin-induced rat AD model in vivo and vitro. A rat AD model was established via a single Aβ25-35 injection (10 μg) into the bilateral hippocampal. DNLA (40 mg/kg/d; 80 mg/kg/d) was intragastrically administrated 7d prior to the Aβ injection, and the administration was continued for 28 days. The effect of DNLA on spatial learning and memory, synaptic morphology, synapse-related proteins levels and Wnt signaling components GSK3β and β-catenin phosphorylation were evaluate. In vitro studies, mitochondrial function and amyloidogenesis of APP were examined. An inhibitor of Wnt pathway Dickkopf-related protein-1 (Dkk-1) was used to determine whether the DNLA-mediated synaptic protection against Aβ25-35 (20 μM) was blocked. DNLA reduced Aβ-mediated toxicity, increased the number of synapses, elevated the postsynaptic density thickness and expression of synapse-related proteins synapsin and PSD95 in hippocampus of rats, and restored dendritic morphology and mitochondrial function, along with an inhibition of amyloidogenesis of APP, leading to the improvement of behavior abnormalities and synaptic deficits induced by bilateral hippocampal injection of Aβ25-35. Furthermore, treatment with DNLA suppressed Aβ-mediated GSK3β activity and the β-catenin phosphorylation. Inhibition of the Wnt-catenin pathway using Dkk-1 partially blocked the effect of DNLA on the expression of Aβ1-42 and PSD95 in culture cells. Taken together, these findings indicated that DNLA could promote the rescue of Aβ-mediated synaptic and mitochondrial pathology in a manner requiring activation of Wnt/β-catenin signaling pathway, demonstrating that DNLA has a protective potential against AD.

Take Away Notes:

- Provide inspiration for finding Alzheimer's disease treatment drugs from traditional Chinese medicine.
- DNLA may represent a potential agent of therapy for the early stages of synaptic abnormal in AD.
- This study provided experimental basis for the treatment of DNLA in AD, and also provided new ideas for the development of Dendrobium nobile.

Biography

Wei Zhang studied pharmacology at the Zunyi Medical University, China and graduated as MS in 2013. She then joined the research group of Prof. Jingshan Shi at the key laboratory of basic pharmacology of ministry of education and joint international research laboratory of ethnomedicine of ministry of education. She received her PhD degree in 2018 at medical college in the Guizhou University . She has published 4 research articles in a reputed journal.

Hemalata Dol

Bharati Vidyapeeth College of Pharmacy, India

Statistically designed Terbinafine Hydrochloride Ethosomal gel for enhancement of transdermal delivery: In-silico molecular docking, in vitro, ex vivo and stability study

Terbinafine HCl (TH), an allylamine antifungal (BCS-II) drug has poor solubility and high permeability. In the present work, we have investigated the potential of ethosomes as vesicular lipid nanocarrier for enhancement of transdermal application of TH. The In-silico molecular docking and binding study was performed. The ethosomal formulation with varying concentrations of phospholipon 80H (PL80H) and the hydroethanolic solution was optimized and fabricated by applying a 32 full factorial design. The impact of independent variables PL80H (X1) and hydroethanolic solution (X2) on dependent variables viz., vesicle size (nm), zeta potential (mV), and entrapment efficiency (EE%) were studied. The formulation batch F8 with 100 mg phospholipon 80H (PL80H) and 40% w/v hydroethanolic was considered as most optimized amongst all the batches. The optimized TH ethosomes were embedded into 1% w/v Carbopol 934 gel to study drug release and skin interaction studies. The optimized formulation evidenced with vesicle size 127.39 ± 2.71 nm, zeta potential - 40.63 ± 2.77 mV and entrapment efficiency 87.55 ± 0.47%. The drug release from optimized ethosomal suspension through the cellophane membrane was much better sustained over 24 h compared to the marketed product. Additionally, the zone of inhibition of ethosomal gel against Aspergillus Bravia (fungal strain) was larger than the marketed product. We have also investigated the inhibitory potential of Terbinafine against squalene epoxidase of Aspergillus through molecular docking. The binding interactions have shown favorable results and explained the role of Terbinafine in fungus growth inhibition. The present study demonstrates that ethosomal vesicle has the potential to enhance transdermal delivery without any skin irritation. The TH loaded ethosomes could be one of the prominent approaches for transdermal application in the management of fungal diseases.

Take Away Notes:

- The research will provide brief emphasis on transdermal enhancement of poorly soluble drug via novel carrier system like ethosomes
- The researchers can utilize this concept of ethosome for delivery of some problematic drug molecules.
- The use of molecular docking studies in the development of vesicles is one of the interesting tool that will help to understand molecular level mechanism.

Biography

Dr. Hemalata Suhasrao Dol studied at Shivaji University, India and post graduated as M. Pharm in 2012. She has experience of teaching 9 yrs and 1 yr research. She received her PhD degree in 2022 at Shivaji University. She has published more than 15 research articles in SCI (E) journals and diled one patent.

Neha M. Munot
Vishwakarma University, India

Formulation and evaluation of biodegradable polymeric scaffolds containing mupirocin microspheres for improved wound healing

Development of a bio-composite using synergistic combination is a promising strategy to address various pathological manifestations of acute and chronic wounds. In the present work, we have combined three materials viz., mupirocin as an antimicrobial drug, mupirocin-chitosan microspheres (Mu-CM) as drug carrier for sustained delivery of drug and PLGA-PEG , as an biodegradable scaffold. Mupirocin microspheres were prepared by emulsion cross linking method. Tannic acid was used for cross linking of chitosan instead of glutaraldehyde. The mupirocin microspheres were found to be spherical by SEM and having mean particle size 3.29µm.The entrapment efficiency of mupirocin microspheres was found to be 81.22% and were able to release drug in sustained manner for more than 5days. PLGA biocomposite scaffolds were prepared using solvent cast/particulate leaching technique and were compared with mupirocin loaded and Mu-CM loaded PLGA scaffolds for various parameters like surface morphology, tensile strength, entrapment efficiency and distribution homogeneity, in vitro drug release, water uptake capacity, cell proliferation on(L929) human fibroblast cell lines, antibacterial activity and stability study, In vivo wound healing efficacy using excision wound model in Wistar Albino rats. The Mupirocin microspheres incorporated PLGA scaffolds showed good in vitro and invivo characteristics in terms of better water uptake, sustained drug availability and antimicrobial activity, faster wound healing. Consequently, the developed formulation with synergistic strategy of combining Mu-CM and PLGA scaffold as a dressing material would be ideal biomaterial in controlling the infection for a longer period and reducing the frequency of application which leads to faster wound healing and cost effective treatment of surface wounds, burns and foot ulcers.

Take Away Notes:

- Present investigation targets drug delivery for healing wounds, which is major problem that needs to be addressed. Wound healing is a biological process related to the regeneration of tissues and normal process of growth, and it is also a continuous process for replacing damaged tissues and completely healing the wound. Infectious organisms preferentially target the wound beneath the dressing materials leading to a serious infection that requires frequent removal of wound dressing and application of topical antimicrobial therapy. Therefore, the concept of incorporating an antimicrobial agent into a template in the form of a biodegradable scaffold that would support cell proliferation and hence lead to improved healing is investigated.
- In this study, simple methods of formulating microspheres as well as scaffolds are discussed. These methods can also be utilized for development of scaffolds for bioengineering or biomimetics synthesis. Also, the polymers and reagents used in the study are biodegradable and safe especially use of tannic acid to cross link chitosan expands the scope of the study.
- Systematic study has been carried out which would help the researchers in solving the practical problems in simple and cost effective way.

Biography

She is Assistant Professor in Pharmaceutics at Vishwakarma University, School of Pharmacy. She has total 13 years of academic experience. She graduated from Pune University, obtained postgraduate (M.Pharm) degree from S.N.D.T. University and a Ph.D. degree from Pacific University. She has about 40 publications and presentations to her credit. She has authored 10 books and chapters for books. She is a recipient of various research grants and awarded with different awards like “Best Researcher of the Year Award” from Sunpure Extracts, “Innovation Award” from Nehru Science center, National Centre for Science Communication, etc. She has represented SPPU at State level Avishkar Competition. She is invited for presentations at various national and international conferences like “Innovation in Education” organized by NITTTR, Pharma 21 etc. She represents Innovation Ambassador of the institute. Her core area of research includes modification of excipients for added functionality, design of targeted drug delivery systems, mucoadhesive drug delivery systems. She is an approved PG guide and has guided around 22 M.Pharm students.

Shilpa Nilesh Shrotriya*, Prajakta Kapadnis
Poona College of Pharmacy, India

Polymeric scaffold loaded with polyphenolic compound as wound dressings: A promising approach to wound healing

Wounds are physical injuries which result in loss of the skin surface integrity. Proper healing of wound is essential for restoration of disturbed functions of skin. In the present research, we report fabrication of polyphenolic compound loaded nanofibrous scaffold as wound dressing for effective wound healing. Nanofibrous scaffolds were prepared by electrospinning and freeze-drying technique using Polyethylene oxide as a polymer and glutaraldehyde as a crosslinker. Prepared scaffolds were characterized for scanning electron microscopy, Differential scanning calorimetry, X-ray diffraction, swelling behaviour, water uptake capacity and drug release kinetics. Further, *in vivo* studies were carried out on rats by excisional wound model. Histopathological studies were performed to investigate the healing process. From the results of scanning electron microscopy, scaffolds containing 3% Polyethylene oxide in dichloromethane: dimethyl formamide (8:2) mixture was selected for further characterization. The optimized scaffold showed more than 95 % release of polyphenolic compound in 168 h indicating controlled release through scaffolds. The histopathological study indicated that polyphenolic compound loaded scaffolds improved the results for granulation tissue score, wound maturity score, period of epithelisation and collagen distribution. This concludes that, polyphenolic compound shows improved wound healing activity when incorporated in electrospun nanofibrous scaffold and freeze-dried scaffolds. Scaffolds extends the drug release for prolong period and helps in cell signaling, exchange of gases to wound surface and cell migration and proliferation. Thus, the polyphenolic compound loaded polymeric scaffolds can be used as a promising approach for improved wound healing.

Take Away Notes:

- Wound healing process
- Benefits of polyphenolic compounds and nanofibrous materials in wound healing
- Nanofibrous scaffolds for Topical therapy and novel wound dressing approach
- Expansion of academic research for startup and readiness to technology transfer
- Alternative drug delivery systems to conventional treatment

Biography

Dr. Shilpa Shrotriya is currently working as an Assistant Professor in Pharmaceutics at Bharati Vidyapeeth, Poona College of Pharmacy. She has total 20 years of academic and research experience. She completed her Ph.D in Pharmaceutical sciences from Pune University. She has about 23 publications, 01 book chapter and more than 50 presentations to her credit. She has received various research grants for her research projects. She is awarded with different awards like “Prof. Duggirala Visweswaram & Prof. Sreemantula Satyanarayana award in the field of Pharmaceutics for research paper” from APTI and IJPER India, “Best poster award for research paper” from society of Ethnopharmacology, APTI, India, etc. She is Runner up in Teacher category (Medicine and Pharmacy) at State level Avishkar Competition. Her core area of research includes nanotechnology, cancer targeting, development of new excipients, design of targeted drug delivery systems, mucoadhesive drug delivery systems, colon targeting, herbal drug technology, etc. She is approved PG and PhD guide.

Ruchika Bajaj[1]*, Lisa B Chong[1], Ling Zou[1], Eleftheria Tsakalozou[2], Zhanglin Ni[2], Kathleen M Giacomini[1], Deanna L Kroetz[1]

[1]University of California San Francisco, USA

[2]Division of Quantitative Methods and Modeling, Office of Research and Standards, Office of Generic Drugs, Center for Drug Evaluation and Research, US Food and Drug Administration, Silver Spring, MD USA

Interaction of commonly used oral molecular excipients with P-glycoprotein

P-glycoprotein (P-gp) plays a critical role in drug oral bioavailability and modulation of this transporter can alter the safety and/or efficacy profile of substrate drugs. Individual oral molecular excipients that inhibit P-gp function have been considered as a mechanism for improving drug absorption, but a systematic evaluation of the interaction of excipients with P-gp is critical for informed selection of optimal formulations of proprietary and generic drug products. A library of 123 oral molecular excipients was screened for their ability to inhibit P-gp in two orthogonal cell-based assays. ?-Cyclodextrin and Light green SF yellowish were identified as modest inhibitors of P- gp with IC50 values of 168 ?M (95% CI, 118-251 ?M) and 204 ?M (95% CI, 5.9-1745 ?M), respectively. The lack of effect of most of the tested excipients on P-gp transport provides a wide selection of excipients for inclusion in oral formulations with minimal risk of influencing the oral bioavailability of P-gp substrates.

Take Away Note:

- Oral excipients and P-glycoprotein
- Calcein AM fluorescence based assay
- Digoxin Flux assay

Biography

Ruchika has BSc (H) Biochemistry from University of Delhi and MSc. Biotechnology from Indian Institute of Technology Roorkee, India and received her PhD from Purdue University where she was trained as a Membrane Protein Biologist. Afterwards, she pursued her postdoctoral training at UCSF. She focused on ABC transporters all the way in her scientific training. She is very much passionate in elucidating in mechanistic underpinning of ABC transporter function using biochemical, biophysical and structural biology approaches, which could help to rationally design novel pharmacological tools to modulate the function of membrane proteins altered in disease.

Suryakanta Swain* and Sailendra KM

The Assam Kaziranga University, India

Showcasing the quality by design framework on nano drug delivery systems

The Quality by Design (QbD) approach empowers the researchers to minimize the number of experimental trials, errors and time during process of formulation development. It helps to identify the significant, influential factors such as critical material attributes, critical formulation variables, and critical process parameters, which may significantly impact the Quality of the products. Nano Drug Delivery System (NDDS) are a selective class of nanomaterials that exploits the nano sized properties to enhance the oral bioavailability of poorly water-soluble drugs, increases drug loading capacity, increase in surface area for optimum interaction at the target binding site, facilitates enhanced permeation and retention (EPR) in cancer cells, reduces enzymatic degradation of the drug, cross blood brain barrier(BBB), accesses the micro circulation in pulmonary system and tight junctions of the endothelial cells. Well, precised and reproducible results might be obtained to achieve the required therapeutic goals of the formulation using the systematic approach called Quality by Design. The systematic QbD-based development of optimized NDDS of poorly water-soluble drugs, providing a fast, efficient, and cost-effective approach to the formulation with enhanced bioavailability potentials. Moreover, functionalization of such NDDS with antibodies and peptide linkers specific to target site enhances their target site concentrations to achieve the therapeutic benefit. The preliminary preformulation studies and the risk assessment enabled the proper identification and selection of independent variables to further optimize the dependent variables. Identification of such key variables and optimization of the same using the QBD or DoE approach is critical towards consistency in developing nano drug delivery systems.

Take Away Note:

- The audience will be able to understand the key steps and tools involved in the QBD process.
- Identification of the desired variables using QBD or DoE approach are key to the success of formulation development and would immensely benefit the participants in their routine work.
- Other faculty could use the QBD approach that could tremendously improve the outcomes in their relevant area of academic and Industrial research.
- The step-by-step approach in NDDS would provide a simpler approach to formulation development where a lot of variables play a detrimental role in the success of the formulation.

Biography

Dr. Suryakanta Swain is presently working as a Dean Research, Founder Principal/Associate Dean, and Head, School of Health Sciences, The Assam Kaziranga University, Assam, India. He did his Ph.D. from Berhampur University and M. Pharm from Biju Patnaik University of Technology, India by Qualifying GATE. He has 14 years of Academic Teaching, Research & Administrative experience in reputed Universities. Dr. Swain published 150 publications in the form of Articles/Books/Patents in International and National Journals with 1690 citations, H-index of 19 and i10-index of 36. He also received many National & International Awards and delivered many plenary sessions as a key-speaker.

Aarti V. Belgamwar

Institute of Pharmaceutical Education and Research, Wardha, Maharashtra, India

A revolution in nanotherapeutics for treatment and management of high grade glioblastoma multiform

Intracranial malignancies represent 1.4% of diagnosed cancers and Glioblastoma multiform (GBM) is one of the most aggressive malignant tumors with an overall dismal survival averaging one year despite multimodality therapeutic interventions including surgery, radiotherapy and concomitant and adjuvant chemotherapy. Globally it counts the 3.5 cases per 100000 people every year. The cancerous tissues invade the surrounding cells making it impossible to cure surgically. Moreover, GBM is amongst the most resistant to chemotherapy and radiation. Currently, there are no curative treatment options available for GBM, and despite rigorous therapeutic research. Only few approved drugs are available for the treatment of GBM that includes DNA alkylators, kinase inhibitors and tubulin inhibitors that too are not effective to fill this gap successfully for management of GBM. The effective and safe delivery of drug candidate at the target site is quite challenging in GBM because of complexity of BBB, insufficient bioavailability of chemotherapeutic agent at tumor site due to physico-chemical nature of active moieties, poor absorption, low oral bioavailability and high protein binding, short half-life resulting in insufficient delivery of current conventional chemotherapeutics which proves challenges in the therapeutic management of the disease. To overcome current modalities nanotherapeutics has emerged as a novel tool in the management of GBM. Nanotherapeutics proves superior over traditional drug delivery techniques as they offer more safety, enhanced biocompatibility and effective site specific targeting with reduced off-target toxicities which may prove breakthrough in neuronal oncology treatment. Different nanostructured drug deliveries includes polymeric functionalized nanoparticles, solid-lipid nanoparticles, liposomes, hybrid vesicles, dendrimers, nanogels, nanorods, and nanowires have been developed for the effective treatment and diagnosis of GBM. Present talk will give insights on molecular pathology and triggering factors of GBM, various innovations in theranostics nanotherapeutics and advancement in the noninvasive targeting of GBM for combatting GBM.

Key words: Glioblastoma multiform, nanotherapeutics, theranostics,

Take Away Note:

- Audience interested in studies on brain targeted drug delivery especially for brain tumors will be able to understand mechanism of GBM and advancement in designing of various nanostructured drug delivery techniques.
- Researchers working on CNS oncology will understand current innovations in the management of GBM.
- Oncologist, formulation scientists and academicians working on GBM will get recent therapeutic alternatives available for GBM treatment.
- Strategies to reduce off target toxicities will be new avenue in the treatment of high grade glioblastoma.
- The discussion for novel targeting introduce new option for therapeutically challenging high-grade glioblastoma.
- It will add the crucial information in scientific database for cancer research community.
- Non-invasive delivery nanoparticles for High-grade Glioblastoma will be a novel way for effective targeting of GBM and reduce off-target toxicities.
- Nanoparticles delivered in the form of atomized spray, which will enhance patient compliance.
- Cost effective medication will be helpful in prevention and management of aggressive GBM in poor and developing countries

Biography

Aarti Belgamwar working as an Associate Professor in IPER, Wardha has completed B. Pharm and M. Pharm from SGB Amravati University and PhD from RTM Nagpur University. She is having 16 years of academia and research experience and her research area is designing of nanomedicines for CNS. There are 3 granted Indian Patents on Neuro-AIDS and 1 patent on Glioblastoma in her credit. She has published 09 research articles and 2 books chapters and delivered 17 scientific talk various conferences. She is recipient of prestigious Woman Scientist fellowship from Department of Science and Technology India for work on Neuro-AIDS.

Devshree Gayakwad[1]*, Abhimanyu Singh Rathore[2]

[1]Acropolis Institute of Pharmaceutical Education and Research, India
[2]Chameli Devi Institute of Pharmacy, India

Development and optimization of nano-emulsion containing rosemary extract as skin rejuvanate agent as a novel drug delivery system

The effective delivery of Herbal drugs as a cosmetic formulation with the minimum side effects and better therapeutic efficacy has remained active area of research for many decades. This study aimed to developed and optimization oil in water (o/w) nano-emulsion containing rosemary extract as well as evaluate its prelimanry and accelerated thermal stability and skin rejuvenate efficacy.

The formulation containing 1% of xanthum gum and 1% of rosemary extract were white homogeneous and fluid is aspects. All three formulation were stable during preliminary stability test , xanthum gum presented a pH compatible to skin pH (4.5-6.0) droplet size varying from 28.71 to 50.23 mV. Rosemary nano emulsion was able to boost immune system of skin and improve blood circulation along with skin cell rejuvenation. Overall, these results indicate that the produced oil-in-water nanoemulsion was stable and skin rejuvenation efficacy, proving to be a product with potential in the cosmetic area.

Key words: Herbal, Novel, Rosemary, Nanoemulsion, oil in water

Biography

Devshree gayakwad have done my b.pharm. In 2003, then joined devi Ahilya College of pharmacy. She has a total experience of 15 years in teaching pharmacology, pharmaceutics, biochemistry, hospital and clinical pharmacy. She has published 5 papers and 4 patents. Also she have reviewed 3 research articles in future journal of pharmaceutical sciences (springer nature)

Carla IM Santos[1,2], M Graca PMS Neves[2], Nazario Martin[3], Ermelinda MSMacoas[1], Gil Goncalves[2]*

[1]University of Lisbon, Portugal
[2]University of Aveiro, Portugal
[3]Universidad Complutense de Madrid, Spain

Advanced multifunctional carbon dots/porphyrys for cancer diagnosis and photodynamic therapy

According to the findings of this study, a novel approach has been developed to address the constraints of employing porphyrins in photodynamic treatment, which include their low solubility and aggregation in biological contexts. The conjugation of porphyrins with graphene quantum dots (GQDs) was investigated as a means of improving the internalization of porphyrins by cancer cells. It was discovered that the GQDs could be linked to an aminoporphyrin using two different chemical methods: thionyl chloride (SOCl2) and 1-ethyl-3-(3′-dimethylaminopropyl) carbodiamide (EDAC). Detailed investigation using several characterization techniques, including TEM, AFM, FTIR, Raman, XPS, and UV-vis, confirm that the SOCl2 method resulted in enhanced porphyrin loading by GQDs when compared to the EDAC method.

Here we investigated the photoactivity of the resulting hybrids and the respective precursors under irradiation with white light, to explore their potential use as photodynamic therapeutic (PDT) agents against breast cancer cells (T-47D cell line). Aminoporphyrin, with an IC50 in the range of 10−100 nM, showed a significant photocytotoxic effect when compared to other reported modified porphyrins. The hybrids showed improved photocytotoxicity with an IC50 1 order of magnitude lower than aminoporphyrin. According to our studies, the synthesized aminoporphyrin-GQDs hybrids promoted efficient uptake by the T-47D cells when compared with the non-immobilized porphyrin. The higher photocytotoxic effects were observed for concentrations higher than 10 nM. These results can be understood as the synergistic effect of the conjugation of porphyrin with GQDs that promotes an efficient uptake of porphyrin by the cancer cells. However, it was noticed that the reduction singlet oxygen generation efficiency of conjugated porphyrin. This preliminary study points out that the new hybrids based on aminoporphyrin-GQDs hybrids present a high potential for being further investigated using patient-specific inducible pluripotent stem cells in 3D culture as predictive cell models for future in vivo PDT studies.

Take Away Notes:

- This work will present novel synthetic methodologies for the development of novel theranostic agents for cancer.
- The novel chemical strategy adopted allowed us to obtain a synergistic effect between porphyrins and graphene quantum dots for improving photodynamic cancer therapy.
- In this study, we showed that graphene quantum dots can help porphyrins be more effective as a PDT because they are better able to stay in water.
- The novel theragnostic agents present high potential in terms of biomedical applications by being able to be stimulated in the near-infrared region (therapeutic window).

Biography

Gil Gonçalves received his PhD in Mechanical Engineering at the University of Aveiro in 2012. After obtaining a Marie Curie grant in 2016, he started working at the Institute of Material Science of Barcelona (ICMAB-CSIC (Spain)) on the development of nanotherapeutic anticancer agents for neutron capture therapy. Currently, he is working at TEMA-UA (Portugal) as a researcher on the development of new carbon-based nanocomposites for environmental and healthcare applications. Gil has (co-)authored numerous scientific papers (h-index 22 and > 2500 citations), communications at national and international conferences, and he is an editorial board member of Scientific Reports (Nature Publishing Group).

Lekshmi R Nath*, Gopika Chandrababu, Sunil Sah

AIMS Health Science Campus, India

Phytochemical-based nanoformulation against hepatocellular carcinoma

Hepatocellular carcinoma (HCC) is one of the deadliest malignancies being the 3rd leading cause of cancer death worldwide. The current treatment of HCC fails to provide tumor specificity, causing many systemic toxicities and poor overall survival benefits especially for patients with advanced stages. Sorafenib, an oral multikinase inhibitor, is the only FDA-approved drug for HCC. However, a wide array of adverse effects limits its use along with the development of resistance. Natural medicines have proved to have significant anti-cancer properties. The major factor that limits their clinical utility is their pharmacokinetic and bioavailability limitations. These limitations can be overcome using an appropriate formulation that can retain its medicinal properties, thereby enhancing its pharmacokinetic properties.. Green synthesized nanoparticles offer significant anticancer effects along with minimal systemic toxicities because of their site-specific delivery into the tumor microenvironment. They can be a promising futuristic tool for the treatment of HCC if properly validated with clinical studies.

Take Away Notes:

- The audience will get a better understanding of the beneficial role of nanoparticles in the treatment of HCC. Green synthesized metal oxide nanoparticles can be a novel approach for the treatment of HCC.
- Nanomedicine researchers will be able to understand the factors that hinder the clinical use of nanoparticles against HCC and thus find ways to overcome these challenges.
- Yes, other faculty can expand their knowledge in the area of green nanotechnology and they can also put this into practical application to formulate green nanoparticles that can surpass the limitations of the present green nanoparticles.

Biography

Dr Lekshmi R Nath is currently working as an Assistant professor in the Department of Pharmacognosy at Amrita school of Pharmacy, Kochi, India. She obtained her M.Pharm in Pharmacognosy from Rajiv Gandhi University of Health Sciences, India in 2008. After this, she joined Rajiv Gandhi Centre for Biotechnology, Kerala, India, and received her Doctorate in Biotechnology in 2016. Her PhD findings on hepatocellular carcinoma recently received four international patents, US, Canadian, Japan and South Korean Patent (WO 2017208254 A1, "Uttroside B And Derivatives Thereof As Therapeutics For Hepatocellular Carcinoma". The FDA has recently granted an orphan drug designation to the small molecule chemotherapeutic uttroside–B against hepatocellular carcinoma. Q BioMed, a biopharmaceutical company has already started a clinical trial for uttroside B against Hepatocellular carcinoma. She has more than 13 years of research experience with over 30 publications. She has published several publications in many renowned International Journals including Scientific Reports, Plose ONE, RSC Advance, Frontiers in Microbiology etc. Her key research interest includes phytomedicine and Hepatocellular carcinoma, liposomal drug delivery etc.

Marwa Hasanein A*, Amira MM, Abeer AAS

National Research Centre, Egypt

All-trans retinoic acid loaded chitosan lipid nanocomplex for enhancing its diabetic nephropathy healing effect

The present study aims to formulate all-trans retinoic acid (ATRA) loaded chitosan lipid nanocomplex (CHLNC) for enhancing its solubility and oral delivery. This is to improve ATRA therapeutic effect on diabetic nephropathy (DN). CHLNC was prepared by o/w homogenization, employing stearic acid, to form lipid nanoparticles coated with chitosan that is stabilized against acidic pH through sodium tripolyphosphate (TPP) crosslinking. Chitosan coated (F7) and naked lipid nanoparticles (F6) were also prepared for comparison with CHLNC. *In vitro* characterization for the prepared formulations were performed comprising entrapment efficiency, particle size, zeta potential, transmission electron microscopy, FT-IR spectroscopy and x- ray diffraction. Stability of chitosan coat in GI fluid revealed that CHLNC was more stable than F7. *In vitro* release indicated an enhanced release of ATRA. In vitro mucoadhesion study proved a notable mucoadhesive property for CHLNC. In DN rat model, serum levels of creatinine and urea were elevated. In addition, adenosine monophosphate activated protein kinase (AMPK) and liver kinase B1 (LKB1) expressions were decreased in DN rats. Treatment with free ATRA and the selected formulations led to a significant amelioration of DN by reducing of creatinine and urea levels as well as elevating AMPK and LKB1 levels. The order of activity was: CHLNC > F7 > F6 > free ATRA. This study revealed the positive impacts of crosslinking of chitosan coat with TPP to avoid solubility and hence detachment of the coat in the gastric acidic pH. Thus, CHLNC can be delivered intact to intestine, unlike F7, and make benefit of mucoadhesive properties of chitosan regarding enhancement of oral absorption of the loaded ATRA.

Take Away Note:

- The audience, who are interesting in the field of drug delivery, can use the learned novel technique for enhancing oral delivery of hydrophobic drugs aiming at improving its biological activity. Chitosan coated lipid nanoparticles have a potential concerning enhancing the intestinal absorption of hydrophobic drugs. However, the chitosan coat could be dissolved in the gastric acidic medium, thus the lipid nanoparticles lose their chitosan coat. In this presentation, we describe a novel technique to keep this chitosan coat stable even in the gastric acidic medium.
- They can apply the learnt technique in their similar work.
- It provides new information to assist in a design problem
- Employing nanotechnology for amelioration of diabetic nephropathy
- Evaluation of the effect of free ATRA and its lipid nanoformulations on AMPK/LKB1 signaling pathway

Biography

Dr. Marwa studied pharmaceutical sciences at the faculty of pharmacy, Helwan University, Egypt and graduated in 2000. She then joined the National Research Centre, and obtained M.Sc. Degree in Pharmacy (Pharmaceutics), Cairo University. She received her PhD degree in 2013 in the same field. She has specialized in pharmaceutical nano-formulation for drug delivery. In 2019, she obtained the position of an Associate Professor of pharmaceutical technology at the National Research Centre. She has published 13 research articles in Scopus indexed journals.

Nicolas Martin[1], Sara F. Ferreiro[2], Eva Alonso-Lopes[2], Soizic Prado[3], Florent Barbault[4], Maël Nicolas[5], Gaël Lecellier[6], Christian Paetz[7], Marc Gaysinski[5], Olivier Thomas[8], Luis Botana[2] and Phila Raharivelomanana[9]*

[1]Saint-Quentin en Yvelines, Ile-de-France, France
[2]University of Santiago de Compostela, Lugo, Spain
[3]National Museum of Natural History, Paris, France
[4]Paris Diderot University, Paris, France
[5]University of Nice-Sophia Antipolis, France
[6] UMR Entropie, IRD, Nouméa, New Caledonia
[7] Max Planck Institute for Chemical Ecology, Germany
[8]National University of Ireland, Galway, Ireland
[9]University of French Polynesia, French Polynesia

Assessment of marquesan rauvolfia nukuhivensis bioactive content

Rauvolfia genus, grown in tropical areas, is well-known for its many species used in traditional medicine which healing properties inspired pharmacological studies leading to successful discovery of innovative drugs through years. Finding of these drugs were directly related to ethnopharmacological uses of these Rauvolfia species and regarding endangered species ones, it became very urgent to conduct phytochemical study the bioactive alkaloidal plant content not only before biodiversity loss but also before traditional knowledge erosion aiming for plant and human heritage conservation program and actions. Rauvolfia nukuhivensis, called locally “tueiao”, is an endemic species grown in Nuku-Hiva Island located in Marquesas archipelago in French Polynesia where the bark is used for intimate woman care. Ethnopharmacological approach was adopted to assess this plant content. For that purpose, firstly, antimicrobial effects was checked if the plant extract played an antiseptic role by testing the extract and contents on bacterial and fungi strains (Escherichia coli, Staphylococcus aureus, Candida albicans and Aspergillus niger) and bioassay results showed moderate to low activities. Then, traditional medicinal information regarding this plant led to establish hypothesis that its uses may be linked to biological activities having close relationship with secretory mechanisms regulation. Thus, this second hypothesis was explored by investigation of ion channels inhibition related to osmotic exchanges and then, inhibiting effects on hNav1.6 currents and hERG channel were so tested. Some alkaloidal constituents, and more especially nukuhivensiums, were shown to significantly induce a reduction of IKr amplitude (hERG current). According to these biological activity results, a computational study through docking was performed in order to design the bioactive pharmacophore of the alkaloidal plant constituents.

The alkaloidal composition of the bark of this plant was assessed by integrated approaches mainly: structural elucidation, phylogenetic analysis and a putative biosynthesis hypothesis statement. Structural elucidation by spectroscopic means (MS, NMR) led to the identification of 13 major constituents belonging to four distinct indole alkaloid skeletons (ajmalane, sarpagane, macroline and β-carboline). As the *Rauvolfia* genus is well distributed in the Pacific region, a phylogenetic study was carried out (using DNA barcoding method) of *Rauvolfia* species, endemic or indigenous in Oceania, as a second approach, aiming to a better understanding of the occurence and distribution of these alkaloids. The very rare co-occurence of these alkaloids belonging to four different skeletons inspired to set up a putative biosynthesis of these components. These data will be helpful to further conservation plans of this endangered species.

Biography

Phila Raharivelomanana, had a faculty position at the University of French Polynesia since 1993 (respectively Assistant professor in 1992, Associate professor in 1993 and Full professor in 2004) as a chemist teacher and phytochemist researcher. She received PhD degree at the University of Nice Sophia-Antipolis in 1992 and joined university of French Polynesia afterwards. She was one of the pioneer researchers working in phytochemistry of Polynesian plants and has published more than 75 research articles in SCI(E) journals.

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KEYNOTE FORUM

DAY 02

5TH EDITION OF
GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

28-30 MAR

Hans-Christian Siebert[1]*, Athanasios K. Petridis[2]

[1]Research Institute of Bioinformatics and Nanotechnology, Germany

[2]University of Dusseldorf, Germany

Improved diagnostic and therapeutic strategies against SARS CoV2 by blood pH analysis of Covid19 patients in combination with molecular modeling and NMR studies

The global outbreak of SARS CoV2/ Covid19 is a great challenge for new concepts and strategies in different fields as glycobiology, nanomedicine or nanopharmacology. When correlating clinical data obtained from patients in intense care units with tools used in structural biology such as NMR and molecular modelling it is possible to develop new diagnostic and therapeutic strategies against SARS CoV2 and other viral infections (e.g. influenza) with a pandemic potential. At first, we have figured out in which way clinical data, in our case, pH value alterations can be directly linked to distinct structure related questions on a sub-molecular level. The effects of biophysical parameters such as temperature, pH value variation and membrane characteristics e.g. peptide solubility as well as the affinity of certain amino acids to sialic acids and sulfated carbohydrates provide helpful hints to identify a potential Achilles heel of SARS-CoV2 infections. *In silico* molecular modelling calculations and *in vitro* NMR experiments (including ^{31}P NMR measurements) have been applied to analyse the structural behavior when potential antiviral peptides are encapsulted by dodecylphosphocholine (DPC). Since lectin-like interactions of sialic acid molecules play an important role when the blocking properties of inhibitory peptides are evaluated DPC micelles were mixed with gangliosides and analysed under physiological conditions with NMR methods. Thereby, we are able to test in which way SARS CoV fusion peptides and potential inhibitory SARS-CoV2 fusion peptides are interacting with phospholipid membranes and gangliosides in a specific way. We have found that the specific interactions of certain collagen fragments with certain SARS CoV2 structures which are involved in the stabilization of the blood brain barrier can be triggered by the application of incretin-mimetics.

Take Away Note:

- Nanomedicine and Nanopharmacology in combination with Glycobiology is important for pharmacology of tomorrow.
- Examples will be given which concerns, especially, SARS CoV2.
- Yes, because nanomedical and nanopharmacological tools have an impact on various fields in medicine in order to reduce complexity.
- Yes, because Nanomedicine and Nanopharnacology at the edge of quantum physics is of importance to address a number of unsolved problems in medicine and pharmacology.
- Yes, because Glycobiology in combination with Nanomedicine and Nanopharnacology is an underestimated field when talking about pandemics.

Biography

Hans-Christian Siebert, born in Kiel, Germany, married, two sons; academic degrees: Dipl. Phys., Dr. rer. nat., Dr. med. vet. habil., Prof. of Biochemistry; study of physics and biochemistry at the Universities of Kiel and Heidelberg. Dissertation at the Ruprecht-Karls University Heidelberg and the Max-Planck-Institute for Medical Research. PostDoc at the University of Utrecht (NL), Bijvoet Center for Biomolecular Research at the Departments of Bioorganic Chemistry and NMR-Spectroscopy.Habilitation (Venia legendi for Biochemistry) at the Ludwig-Maximilians-University, Munich. Since 2007: Chair of Biochemistry and head of the institute for Biochemistry and Endocrinology, Faculty for Veterinary Medicine at the Justus-Liebig-University Gießen. Since 2010: Scientific director at the Research Institute for Bioinformatics and Nanotechnology (RI-B-NT) at the Kieler Innovations- und Technologiezentrum (KITZ). Since 2021 head of the RI-B-NT 2.0 – A Nanomedical Facility, Schleswig-Holstein, Germany.

Marlene Teresa Llopiz Aviles

Clinica Responsable Operativa, SC, Mexico

How the pharmaceutical world was affected by the Covid-19 Pandemic: A look back two years later

The World Health Organization and countries worldwide have acknowledged that the COVID-19 pandemic has been a fast-evolving situation and a terrible threat to people of all ages. In the face of such an alarming situation with a heavy toll on healthcare services and vulnerable individuals, there can be no doubt that the precautionary principles set forth needed to guide decisions when concerning the pharmaceutical world.

Home-offices became a new world for all. It was a difficult switch to become used to. Staff staying at home would never be the same as having them in the next cubicle, office or on another floor. Communication was different, impersonal, long distance – even if within the same city. The "personal touch" was gone. There was no interaction, sharing of work or even life family events. Longer hours were consumed on work – burnout, resilience and mindfulness.

The pharmaceutical world has also suffered!

No doubt the pharmaceutical industry had to change its way of doing business. Staff was sent home, all meetings were carried out remotely and online, no visits were made to key opinion leaders, no advisory boards were carried out, focus groups were not done as usual. Medical representatives, medical scientific liaisons were kept from visiting physicians. Clinical research came to a standstill for a while.

A new adjustment to schedules, longer hours, working from home with spouses and children sharing closed spaces, no time for sports, gyms or restaurants may living difficult and hard to bear. Psychological burdens became apparent, frustrations rose, burnout surfaced and resilience often came to the rescue.

In this presentation, we will review the different changes and work modalities within the pharmaceutical field.

Biography

Dr. Marlene Llópiz-Avilés is CEO of Clinica Responsable Operativa located in Mexico City. She holds a Bachelor of Arts degree from Austin College, a medical doctor degree from Universidad Anáhuac and a Master of Public Health degree from Harvard University. She works closely with the pharmaceutical industry and has also supervised Phase I – III clinical trials in all therapeutic areas, designed strategies for the clinical conduction of studies (recruitment of patients, site selection and principal investigators), among other things. She has written diverse articles and books and is currently working on a book on Pharmaceutical Medicine. She has received several honors.

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SPEAKERS

DAY 02

5TH EDITION OF
GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

28-30 MAR

Ekaterina Pashkina[1]*, Maria Bykova[2], Alina Aktanova[1], Olga Boeva[2], Daria Demina[1], Vladimir Kozlov[1]

[1]Research Institute of Fundamental and Clinical Immunology, Russia

[2]Novosibirsk State Medical University, Novosibirsk, Russia

In vitro study of glycyrrhizic acid-based drug delivery system for allergen-specific immunotherapy

The most effective method of treating allergic diseases is allergen-specific immunotherapy (SIT). To reduce the risk of side effects and improve delivery of allergens to the mucosa, various delivery systems such as liposomes, dendrimers, nanoparticles, etc. can be used. Today, there is a lot of data about delivery systems based on glycyrrhizic acid (GA) and its derivatives, but this delivery systems have not yet been used for allergen-specific therapy. At the same time, it is known that GA has an anti-inflammatory effect, it can shift the balance towards Th1, increase the number of Treg cells, which means that in the future it is able to enhance the anti-allergic effect of SIT and reduce the risk of side effects.

We have studied in our work the effect of the GA supramolecular complex and the allergen of house dust mite Der p 1 on the viability, subpopulation composition and cytokine-producing ability of mononuclear cells of patients with sensitization and doctor-diagnosed allergy to house dust mite allergen and healthy donors. It was found that the complex of GA and Der p1 increased the number of Treg cells in PBMCs compared to free Der p 1. Also, GA-Der p1 complex affect the inflammatory and Th2 cytokine production.

The results of evaluating the effect of the GA complex with Der p 1 on the phenotypic and functional characteristics of PBMCs of PBMCs indicate a change in the Th1/Th2 balance towards the cellular immune response, which can increase the efficiency of the Der p1 peptide during ASIT.

Funding: The reported study was funded by RFBR, project number 20-315-70039.

Biography

Ekaterina Pashkina is a Senior Researcher in Laboratory of Clinical Immunopathology of Research Institute of Fundamental and Clinical immunology. She graduated from Novosibirsk State University with specialty in cytology and genetics. Since then, she has been working in the field of immunology and drug delivery. She received her PhD (Clinical immunology and allergology) in Research Institute of Fundamental and Clinical Immunology, in the field of «Immunomodulating properties of a complex of taftsin and cucurbit[7]uril». At present time, she also work as Adjunct lecturer (part time) in Novosibirsk State Medical University.

Radhika Khanna*, Varshney VK, Tripathi YC

Forest Research Institute, Uttarakhand, India

Needles of Cupressus torulosa D. Don ex Lamb as a sustainable antioxidant and antidiabetic drug material

Great interest has been directed towards plants as a sustainable source of antioxidant and antidiabetic materials. To avoid the destructive harvesting and promote stabilized usage of plant, leaves are used as the prime component for the study. The Phenolic compounds constitute one of the major groups of plant chemical constituents acting as primary antioxidants, Flavonoids as one of the most diverse groups of natural compounds possessing a broad spectrum of biological activities. In consideration of the view, *Cupressus torulosa* D. Don ex Lamb commonly known as Himalayan cypress or Bhutan cypress was studied for total phenolic content (TPC) and total flavonoid contents (TFC) and its antioxidant and antidiabetic efficacy. This is a large evergreen conifer tree under the family Cupressaceae, native to South Asia and distributed in temperate zone up to 3000 m. Leaves of the plant were collected from various locations of Uttarakhand and Himachal. Dried and powdered leaves were at first defatted with Hexane and then sequentially extracted followed by removal of chlorophyll which yielded 19.2% of total extract. TPC and TFC were determined spectrometrically following Folin-Ciocalteu and aluminium chloride protocols respectively. The antioxidant activity of leaf extract was evaluated in term of DPPH, metal chelating, hydrogen peroxide scavenging and reducing power efficiency taking Ascorbic acid (standard antioxidant) as positive control. Antidiabetic activity was accessed by α-Glucosidase inhibition assay. The highest TPC and TFC in the extract were recorded as 208.21 g GAE/g and 85.19 mg QE/g of dry extract respectively. Furthermore, the results all in-vitro assays in relation to antioxidant and antidiabetic activity were found comparable with that of positive control. The better antioxidant activity and antidiabetic activity of the plant gained credence from the high TPC and TFC in the plant extract, thereby establishing the plant as a promising source for the two mentioned activities.

Take Away Notes:

- Basics of pharmaceutical research will be known.
- They will be able to know from the scratch how active molecules are identified and isolated.
- As the audience is mixture of various streams so knowledge of chemistry will be interlinked to pharmaceutics.
- This will assist the listeners in knowing more new plant materials which are effective antioxidant and antidiabetic.
- It provides practical solution for the use of sustainable material for pharmaceutical industry.
- As the plant material used is underutilized and unexplored so the is in whole a new piece of information.

Biography

Ms. Radhika Khanna graduated in Bachelors of Science (Medical) from S.R. Government college Amritsar in 2016 and studied degree of masters in chemistry from Khalsa college Amritsar in 2018. She joined Forest Research Institute (FRI), Dehradun, Uttarakhand, India in 2019 works on the position of researcher and a Ph. D Scholar under the supervision of Dr V.K. Varshney (Scientist G) and Co-supervision of Dr Y.C. Tripathi (Scientist F).

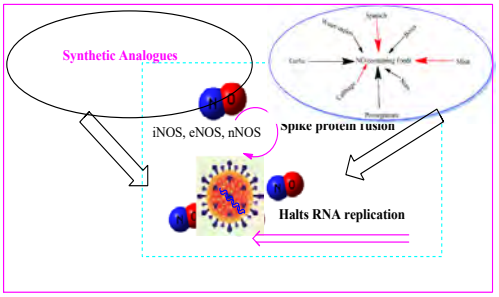
Jan Mohammad Mir

Islamic University of Science and Technology, India

The nobel prized nitric oxide molecule as a noble treatment for nCOVID

In the prevailing coronavirus disease-2019 (COVID) times, scientists are eager to develop vaccine against COVID-19, and careful measures are being taken to develop an effective drug. Meanwhile, several antiviral compounds have been repurposed for the COVID-19 treatment, and drug repurposing has yielded satisfactory results. In the meantime, NO is also under clinical trials to find its potentiality as anticoronavirus. This work aims to describe the therapeutic potential of nitric oxide (NO) for the treatment of deadly (COVID-19). The significance of NO in mitigating the COVID-19 associated symptomatic complications has also been addressed in this work. So, the profound antiviral effects of NO against coronavirus, and also the role it plays in relieving symptomatic severity of COVID-19 are supportive of the fact to declare NO as a therapeutic option for this disease.

Keyword: corona; COVID-19; NO; oxidation stress; nitrites; nitrates



Biography

Jan Mohammad Mir is currently working as an Asst. Professor at the Islamic University of Science and technology, Awantipora-J&K. He bagged his Ph.D. from R.D. University, Jabalpur in 2015 and has very recently completed his D.Sc. degree from the same university. His postdoctoral research mainly involves the molecular modeling and medicinal implications of metal based gasotransmitters. Currently, he is seeking the role of NO, CO and H2S in minimizing the COVID-19 associated severity. He has been a good academician and a researcher. As a young researcher his scientific contributions have got more than 550 citations till now (h-index >16). As per the available details, he has published more than sixty research papers of current scientific temper in various reputed journals covering most of the world famous publishers. He has complied more than seven books and several book chapters till now. Dr Mir is currently serving as editor in Chief of Reviews in Pharmacy and Pharmaceutical Sciences (Prime open access), also serves as associate editor of Journal of Transition Metal Complexes (Bendola Publishers). He bagged several researcher awards including Father Science and INSCA Young Scientist Awards.

Kalirajan Rajagopal
JSS Academy of Higher Education & Research, India

Virtual high throughput screening study to identify potential inhibitors from natural compounds against SARS-CoV-2 Mpro: A systematic molecular modelling approach

In 2020, COVID-19 has created a major threat to human population across the world. In this pandemic, it is very difficult to discover novel drugs immediately. So, natural remedies for the prevention and treatment of COVID-19 has been widely accepted as the rapid way for effective therapeutic options which can be identified via *in-silico* drug screening experiments. The main protease (MPro) is an important drug target as it is essential and ubiquitous in SARS CoV-2 virus. In this study, we performed *in-silico* high-throughput virtual screening with library of 325,000 natural compounds from supernatural-II database to identify potential hits. We used 3D crystallographic Mpro protein (6XQS.pdb) structure to find the lead molecules. The initially obtained top 100 hits from VHTS were subjected to SP docking and the top 30 hits H1-H30 were further subjected to the extra-precision (XP) docking by using Glide module and also binding free energy calculations for final compounds were performed by prime MM-GBSA module of Schrodinger suit-2020. It is evident that Coulomb and van der Waals energy were major favourable contributors while electrostatic solvation energy term disfavours the binding of ligands to the Mpro target protein. The *in-silico* ADMET properties were predicted by using Qikprop, Chem Axon and data warrior tools which showed the favourable pharmacokinetic profile of natural compounds. In order to validate the stability of inhibitor-protein complex, compounds SN00340755 and SN00213037 with the highest inhibitory potential against Mpro and lowest binding free energy was subjected to 100-ns molecular dynamics simulation using Desmond module.

Take Away Notes:

- This research work explains Virtual High throughput screening of natural products against SARS CoV-2 target.
- This research that other faculty could use to expand their research or teaching.
- This research work explains the docking, ADMET, molecular dynamics study of the natural hits.
- This research work will be helpful to design novel molecules against COVID-19.

Biography

Dr. Kalirajan Rajagopal graduated both UG and PG in Pharmaceutical Chemistry at The Tamilnadu Dr. MGR Medical University, Chennai. He received his PhD degree in 2013 at JSS University, Mysuru, India. He has 23 years of teaching and research experience and Currently working as an Associate professor at JSS Academy of Higher Education & Research India since July, 2006. He has nominated as member in Board of studies in various universities. He Published 78 research papers with Impact paper range 0.1 to 6.5 and has H-index 14 by Scopus and 18 by Google scholar and 5 books. Received many awards.

Swati Mutha
Vishwakarma University, India

Targeted vesicular drug delivery insight

Vesicles are the amphilic structure having aqueous core at the center. These vesicular drug delivery systems(VDDS) have found to be more valuable for controlled drug delivery, generally classified as Lipoidal biocarriers (e.g. Liposomes, ethosomes and transfersomes) and Non-lipoidal biocarriers (e.g. Niosomes, elastic niosomes and polymersomes) in which lipids and amphilic compounds other than lipids are used as main membrane forming components respectively. The 'liquid-state' vesicles (elastic) are more efficient in drug transport than 'gel-state' vesicles (rigid). The transfersomes, ethosomes and elastic noisomes are ultra- flexible carriers indicated for good skin permeation. Several studies have demonstrated that both processing and composition parameters are the key factors in deciding lamellar configuration, entrapment of the drug and stability aspect of dispersion system.

In the present talk like to cover the composition, application case studies of of some of the novel targeted VDDS like pharmacosomes in ophthalmic treatment, Colloidosomes as polymeric microcapsules, Polymerasomes in migraine treatment, elastic niosomes in transdermal drug delivery, Herbasomes with better stability profile, Spingosomes as alternative to liposomes

Take Away Notes:

- Audience will come to know newer vesicular drug delivery options for targeted delivery which is mostly needed like in cancer treatment.
- Latest knowledge/ technology always opens room for research

Biography

Swati Mutha Professor of Pharmaceutics at Vishwakarma University has research and teaching experience of total over 16 years. Guided more than 25 M. Pharm. students for their research dissertations, my primary areas of research include conventional and novel drug delivery systems, industrial pharmacy, modified release formulations and acceptability study in patients. Numerous research articles in various national and international reputed journals and publication houses, various oral and poster presentations in national and international conferences helped me build few niche skills in academic and technical research. Received PCCA (USA) Best Poster Award in International Conference of EuPFI, 1st prize in International Conference by DPU (Pune, India) and Awarded in International conference by Nirma University are my recent achievements. Additionally, she received grants from SPPU & UGC, for my research work. She is presently seeking interdisciplinary partnerships for research in areas like Hospital Pharmacy, Pharmacy Informatics, Pharmaceutical Technology, Pharmacy Automation and Industrial Pharmacy. She would also like to share my academic achievements like 'Maharashtra State Topper at D. Pharm. level' and 'Institutional Pharmaceutics Topper at M. Pharm. level' in my introduction herewith.

Mitali Bodhankar*, Davini Bobde
Gurunanak College of Pharmacy, India

Proliposomes and Ethosomes in skin treatment & skin nutrition

The state of one's skin has been said to represent one's overall health and age. Nutrition and its effects on the skin have raised the interest of scientists and clinicians around the world for ages. One of the elements that contribute to overall skin health is nutrition. Skin's structural integrity and biological function are affected as a result of poor nutrition, resulting in an aberrant skin barrier. These nutrients are used as ingredients in cosmetic products as well as active compounds in therapeutic agents for treating certain skin disorders. The novel drug delivery systems can be effectively used for treatment of skin in various skin conditions. The carrier based drug delivery like liposomes, ethosomes, niosomes, lipospheres, microsponges, solid lipid nanoparticles etc. are used to treat skin problems as well as for skin health and nutrition. Proliposomes are more effective over liposomes as they overcome the drawback of instability. Ethosomes are also more effective because of better penetration because of its composition. The formulations containing drugs and nutrients were prepared and were analyzed for particle size, permeation, zeta potential and stability. The study shows the best use of these Novel drug deliveries in conditions like acne and hyperpigmentation. Topical administration of probiotic bacteria Lactobacillus acidophilus alongwith proliposomes of the drug modulates immunity and affects keratinocytes when administered topically. Ethosomal gel formulation of Vit A and Vit C helps in deeper penetration in Hyperpigmentation. Also the drug Hydroquinone and Vit A included in ethosomes and vit C in gel formulation give better results.

Take Away Notes:

- Skin conditions often require the prolong treatments. Sometimes the skin problems are because of lack of proper nutrition or some specific conditions of which the etiology is not known.
- Topical administration of drugs and nutrients is challenging due to improper penetration and effectiveness of these formulations. Due to larger doses of Vit C or Probiotics it is not easy to include them in delivery systems alongwith the drugs but together they give wonderful results.
- So preparing proliposomes or ethosomes of drugs and simultaneously including probiotics in gel formulation serves the purpose which can effectively be used in the treatments of skin condition like acne and hyperpigmentation.
- The acidic condition of skin is mentained which further helps in better absorption.

Biography

Dr. Mitali Bodhankar studied Pharmacy at the Rashtrasant Tukdoji Maharaj Nagpur University, India and Post graduated as M. Pharm. (Pharmaceutics) in 1992. She then joined academics at Gurunanak College of Pharmacy run by Sikh Education Society. She received her PhD degree in 2013 from RTMNU. She guided post graduate students and is also got recognition as a Ph.D. Supervisor from RTMNU. She obtained the position of an Associate Professor at Gurunanak College of Pharmacy. She has published more than 30 research articles in scientific journals.

Bhupendra Gopalbhai Prajapati

Shree S.K.Patel College of Pharmaceutical Education and Research, India

Liposomes for occular drug delivery

Liposomes are known to have significance in drug delivery owing to their unique structure prove to be which enables the formulator to choose from both the hydrophilic and hydrophobic drugs as it serves promising for both. Basically, liposomes are vesicular systems which constitutes of an aqueous core surrounded by phospholipids layers of natural or man-made origin. The aqueous core can be filled with active molecule or medication and the drug delivery then takes place, thus due to this unique nature Liposomes hold a promising position in delivery of ophthalmic products. Ocular route is highly compliant to the patient however due to several disadvantages like ocular surface barriers, ocular drainage and lack of penetration limits the usage of this route. Liposome can be employed as a vectored delivery approach to the eye as is biodegradable and biocompatible nano-carrier and can widen the permeation of poorly absorbed drug molecules by binding to the corneal surface and improving residence time. Chronic ocular contagious infections such as conjunctivitis, bacterial keratitis requires formulators to elevate drug concentration at the site of infection and in addition management of these diseases requires recurrent administrations of the formulation which may result in developing drug resistance and reduces patient compliance. Ergo, In order to curtail pre-corneal drainage and increase bioavailability of the current study establishes a role of liposomal formulation for the delivery of drug targeting ocular infections.

Biography

Dr. Bhupendra works as a Professor in the Department of Pharmaceutics, Shree S.K.Patel College of Pharmaceutical Education and Research, Ganpat University, North Gujarat, India. He did his Ph.D. from Hemchandracharya North Gujarat University, Patan. He did his PG and UG from M.S.University, Baroda. He has 19 years of experience in academic/industry (17+2). He was awarded the Carrier Award for Young Teacher by AICTE, New Delhi in 2013. He was also awarded for Distinguished Associate Professor in TechNExt India 2017 by CSI, Mumbai. He claims on his name more than fifty national and international publications. He fetched grants for Research Projects, Staff Development Programs, Seminars, Conferences, and Travel Grants from National and State Government agencies. He is also given his guidance in industrial consultancy projects conducted at the institute. His two patents were published and one application was submitted at the Indian Patent office. He had delivered expert talks and invited scientific sessions in several national and international conferences and seminars. He is actively working in the field of lipid-based drug delivery and nanotech formulations. He guided 7 Ph.D. and 45 PG research scholars supervised. 5 Ph.D. and 3 PG research scholars are currently working under his guidance in the field of Nanoparticulate Drug Delivery and Bioavailability Enhancement.

P.K. Suresh
Vellore Institute of Technology, India

Encapsulated natural molecules (flavonoids and stilbenoids) and model system-based cell death induction -focus on liposomes and cell/cell-free ghosts-based delivery systems

As per the WHO statistics, approximately 60% of the currently available anti-cancer chemotherapeutics are natural in origin. Flavonoids and Terpenoids constitute a distinct subset of such natural molecules. These molecules, found in various fruits and vegetables and other plant sources, have been extensively studied for their anti-oxidant potential, cytotoxicity and stress-induced cell death potential. However, seasonal variations as well as the possible loss of bioactive components (as a result of cooking and/or heat-induced food processing), the molecules would perforce have to be synthesized (using templates from Mother Nature). Such commercially available synthesized derivatives can be tested in model systems. Luteolin, a polyphenolic flavone, has been widely researched into for its antioxidant, cytotoxicity and cell death properties. We have demonstrated increased Luteolin-mediated in vitro antioxidant potential; cytotoxicity as well as cell death induction in HaCaT cells (in an immortalized skin cell line isolated from an adult). Due to its hydrophobic nature (Log P ~2.5), we felt a need to encapsulate this molecule and improve its cell death potential, by its enhanced uptake through the cell membrane phospholipid bilayer with a concomitant decrement in the dose/concentration. We have demonstrated that the liposome-encapsulated variant increased cytotoxicity and cell death induction, based on statistically significant increases in the activity of human caspase-3 and human caspase-14 (an enzyme, with a restricted tissue distribution, and expressed in the cornifying layer of human skin, apart from its expression in HaCaT and MCF-7 cells). Pterostilbene (a natural molecule present in the berries as well as grape leaves and vines) is another hydrophobic molecule (Log P ~3.69) in the stilbenoid category. Again, its hydrophobic nature prompted us to synthesize DOTAP-liposome-encapsulated Pterostilbene and preliminary screening has shown an increased cell death induction potential, correlated with a paradoxical dose-dependent decrement in the activity of human caspase-14 (increasing with increasing levels linked to human breast cancer tumorigenesis). This data set needs to be validated in 3D systems (considered to be better mimics of the tumor mimicking the hypoxic/necrotic core, followed by the quiescent and proliferative cells closer to the surface of the cell aggregates). This 3D system, when enriched for stem cells, would be a more realistic model for evaluating the chemotherapeutic potential of flavonoids, stilbenoids and their liposome-encapsulated variants. In addition, organoid models, that incorporate the vasculature as well as the immune components, would be superior in predicting the toxicity and cell death potential of our molecule-nano-construct combination. In order to overcome the inherent limitations of the liposome-encapsulation strategy, MSC, erythrocyte -ghost (produced from the cell membranes of) exhibit tropism towards the desired target (based on the cells-of-origin of these nano-ghosts, apart from them being biocompatible and immune-tolerant, thereby making them excellent candidates for specifically testing ghost-encapsulated Luteolin and/or Pterostilbene in our higher order model systems. Exosomal ghost (synthetic or natural) derived from membrane-bound vesicles that are known to be involved endogenously in cell-cell communication can also be employed for their drug delivery capabilities, since they will be tolerated by our immune system and are biocompatible in nature with tropism properties.

Take Away Notes:

- The audience will be able to comprehend and appreciate the importance of liposome-natural molecule encapsulation as nano-ghosts as drug delivery vehicles.
- This lecture will be targeting research scientists and research scholars in the academic, government as well as the private sectors.
- This research will also help the teachers in the area of natural molecules, liposomes-based encapsulation as well as

nano-ghosts-based drug delivery tools.

- Since approximately 40% of the drugs fail due to poor Pharmacokinetic profiles, our approach would improve uptake and hence, should be considered as the method-of-choice.
- Our experimental design (involving encapsulation) is better than that involving treating cells with the parent drug.

Biography

He is a Professor Higher Academic Grade (PHAG) in VIT, Vellore. He has 22 years of teaching, research and administrative experience (post-Ph.D.). He received his second masters and Ph.D. from the SIUE, Illinois, USA and the UC, Ohio, USA respectively. He was a PDF at the UT at Austin, TX, USA and at Rutgers University, Piscataway, USA. P.K. Suresh has authored/co-authored 56 publications in SCOPUS-indexed journals with an h-index of 13 and a cumulative citation index of 597. He has mentored students at several levels including those pursuing their doctoral degree. He is interested in drug development and delivery systems.

Ashwini Jadhav*, Shanmugarajan TS

Vels Institute of Science, Technology & Advanced Studies, India

Overview on Nano-carriers for antihypertensive drugs

Most commonly used route of administration for drugs is oral route. Poor water solubility or permeability of medications, as well as a wide pH range displayed by the gastro intestinal tract, are all obstacles to oral absorption. Hypertension, which is currently a worldwide epidemic, is a risk factor for significant cardiovascular disorders such as myocardial infarction, stroke, heart failure, and peripheral artery disease.

Although multiple medicines operating through various mechanisms of action are available in conventional formulations for the treatment of hypertension, they confront significant hurdles in terms of bioavailability, dose, and related side effects, all of which restrict their therapeutic efficacies. Studies have shown that incorporating a medicine into a nanocarrier can improve drug bioavailability while also lowering the toxicity associated with high therapeutic doses. The current review discusses the difficulties with traditional antihypertensive formulations and the necessity for oral nanoparticulate systems. They can be used for targeted drug delivery, in treatment of cancer, in cosmetic and agro food industry also so Nanocarrier system is a great challenge over conventional formulation to reduce the problem related with other formulation.

Take Away Notes:

- Rationale for using nanocarriers
- Constraints with oral delivery of antihypertensive
- Nanotechnology-based oral delivery of antihypertensive
- Currently used nanocarriers for the antihypertensive drug delivery

Biography

Ashwini V.Jadhav is currently working in department of Pharmaceutics at GSM, college of Pharmacy Wagholi, Pune ,Maharashtra.she has total 12 year academic and one year industrial experience. She obtained her M.Pharm in Pharmaceutics from SPPU, pune university India in 2014 and perusing PhD from VISTAS,Vels university, Chennai,Tamilnadu,India.She has more than 10 years of research experience with over 30 national and international publications. She has approved Teacher from SPPU and MSBTE governing Body. She worked as research coordinator in the institute. She has guided around 5 M.pharm students. Her research areas for interest includes nanocarries development, advance drug delivery system for pediatric patient, design of targeted drug delivery systems.

Prerna Sharma*, Kumar Guarve
Guru Gobind Singh College of Pharmacy, India

Transdermal drug delivery systems

Various non-invasive administrations have recently emerged as an alternative to conventional needle injections. A transdermal drug delivery system (TDDS) represents the most attractive method among these because of its low rejection rate, excellent ease of administration, and superb convenience and persistence among patients. TDDS could be applicable in not only pharmaceuticals but also in the skin care industry, including cosmetics. Because this method mainly involves local administration, it can prevent local buildup in drug concentration and nonspecific delivery to tissues not targeted by the drug. However, the physicochemical properties of the skin translate to multiple obstacles and restrictions in transdermal delivery, with numerous investigations conducted to overcome these bottlenecks. In this review, we describe the different types of available TDDS methods, along with a critical discussion of the specific advantages and disadvantages, characterization methods, and potential of each method. Progress in research on these alternative methods has established the high efficiency inherent to TDDS, which is expected to find applications in a wide range of fields.

Transdermal drug delivery system (TDDS), Drug delivery System, Drug targeting, Natural product

Take Away Notes:

- The audience will be able to a new level of capabilities that position transdermal drug delivery for increasingly widespread impact on medicine.This helps to audience in this drug delivery overcomes the challenges associated with current popular drug delivery; thus, it shows a promising future. According to the duration of therapy, various drugs are commercially available in the form of transdermal patches
- Yes researcher and other faculty could use to this topic expand their research or teaching?

Biography

Prerna Sharma is currently working as a assistant professor in Guru Gobind Singh College of Pharmacy, Yamunanagar. She is 9.7 years teaching experience as assistant professor and Training & Placement Officer and She is selected as panel expert for AICTE STTP Programme. Her field of specialization is Pharmacogonosy and She has completed his master in Pharmaceutical sciences (2012) honour with gold medalist/appreciation in RITS, Sirsa, India and recently she is purusing his PhD from the Uttarakhand Techical University, Dehradun, India, Her field of expertise is standardization of herbal plants/herbal formulation. Her research area includes pharmacognostical & phytochemical investigation of indian medicinal plants, She has 30 research/review publication national/ international journals of repute to her credit, 40 Copyrights, 2 Patents and deligated more than 30 National/international conferences/ workshops. She is honoured with young research scientist award by SPER and TIPA in Thailand. She is also president in SPER women forum and life member of professional bodies like association of pharmaceutical teachers of india(APTI).

Micheline Khazzaka

Independent researcher, Lebanon

Pharmaceutical marketing strategies' influence on physicians' prescribing pattern in Lebanon: Ethics, gifts, and samples

Background: Drug companies rely on their marketing activities to influence physicians. Previous studies showed that pharmaceutical companies succeeded to manage physicians prescribing behavior in developed countries.

However, very little studies investigated the impact of pharmaceutical marketing strategies on prescribing pattern in developing countries, middle-eastern countries. The objective of this research was to examine the influence of drug companies' strategies on physicians' prescription behavior in the Lebanese market concerning physicians' demographic variables quantitatively. Moreover, this study tested whether Lebanese physicians considered gifts and samples acceptance as an ethical practice.

Take Away Notes:

- Findings of this study provided an insightful work, serving as one of the first humble steps in the imminent direction of merging this paper with the previous literature.
- From a managerial perspective, pharmaceutical marketing managers of drug companies can use the research findings to design better their strategies directed to the Lebanese physicians who can also benefit from the results obtained.

Biography

Dr. Micheline Khazzaka studied Biochemistry at the Holy Spirit University of Kaslik and at the Lebanese University, Lebanon and graduated as MS in 2014. She then earned in 2019 a doctorate in business administration from Toulouse Business School in France and Spain. She has published 2 research articles in scientific journals.

Noor Zafar, Ali Imran*, Muhammad Umair Arshad

Government college University, Pakistan

Evaluating the effect of functional fries on appetite and postprandial glucose mangment perspective in healthy females.

The current study was designing to explore the impact of pulses flour coating on fries in order to evaluate their impact on short term appetite, postprandial glucose and food intake. In first phase, the pulses (chick pea and mash bean) were procured from local market of Faisalabad and grounded to obtain their flour. Afterwards proximate composition of pulses flour was estimated. Moreover, four kind of treatments were prepared T1 (Fries coated with Chick pea), T2 (Fries coated with mash Bean), T3 (Fries coated with (mash Bean+ Chick pea) and T¬0 (Fries without coating) after consumer acceptability. In last segment, a cross over randomized short term trial were carried out for evaluating the therapeutic potential of pulses coated fries on short term appetite, postprandial glucose and food intake of selected subjects. Purposely, 12 healthy females age 18–30 years old with a normal BMI (20–24·9 kg/m2) were recruited via advertisements within the Government College University Faisalabad according to predefined inclusion and exclusion criteria. The participants were come with 10–12 hour overnight fast and attend four sessions randomly on a weekly basis during which they were receive selected treatments. The sleep habits Performa, stress factors questionnaire and activity questionnaire alongside Blood Glucose (BG) and Visual analogous scale (VAS) Performa were filled before administration of treatments. Afterward the participants were offered isocaloric and isovolumetric treatments. After the treatment consumption, VAS and BG levels were estimated after 15, 30, 45, 60, 90 and 120 mints intervals. From results it was depicted that both pulses (chickpea and mash bean) were contained higher amount of protein however, the highest amount of protein (20.05%) was observed in chickpea . Likewise, in sensory evaluation T2 (20%chickpea), T5 (20 %mash bean) and T8 (10% chickpea+ mash bean 10%) alongside control got highest acceptability scores. In short term human efficacy trial, T2 treatment caused maximum glucose suppression (99.56mg/dL) as compared to other treatments T1, T3 and T4 as, 116.92, 105.98 and 102.68 mg/dL mean blood glucose concentration, respectively. Same trend was observed for average appetite, the treatment T2 exhibited maximum decline (36.90 mm) in average appetite than that of T1, T3 and T4 as, 45.81, 42.43and 40.13mm, respectively.

Biography

Dr. Ali Imran is currently working as assistant Professor in the Institute of Home and Food Science from more then 8yrs. He has expertise in formulation of plant based nutraceutical based dietary intervention against oxidative stress mediated maladies both in animal and human models. He has more then 60 high impacted publication in reputed food science and nutrition journals. He also won many Competitive research grants relevant to his expertise. Currently, he is working on the role of plant based nutraceuticals in brain health on animal models. He also wrote more than 10 book chapters on health endorsing perspective of polyphenols.

Luiz-Pereira A
Fundacao Hemominas, Brazil

An overview about pharmacopollution and household waste medicine (HWM)

Pharmacopollution is a public health and environ-mental 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 (patients 'excretion and littering). The last source is the focus of this presentation. Research questions are "What is the Household Waste Medicine (HWM) phenomenon?", "How HWM and pharmacopollution are related?", and "How is the reverse logistic system for HWM in Brazil?". The Brazilian HWM case is remarkable because it is the fourth pharmaceutical market (US$ 65,971 billion), with a wide number of private pharmacies and drugstores (3.3:10,000 pharmacy/inhabitants), self-medication habits. The HWM generation is estimated in 56.6 g/per capita, or 10,800 t/year. National take-back programs were recently implemented.

Biography

Dr. Pereira has a Ph.D in Sanitation, Environment and Water Resources (Federal University of Minas Gerais – UFMG, Brazil), Master in Administration – reverse logistics (FUMEC University), and bachelor in Administration (UESB). Author of international articles, such as Environ Sci Pollut Res and others. Author of "Reverse Logistics and Sustainability" (Cengage) and "Solid Waste Management and Management" (Juris Lumen). Top 6 Fedex Reverse Logistics Professional 2014 Award and Top 3 9th Public Management Award. Dr Pereira also has experience in Germany and Brazil. Dr Pereira is Springer Nature, Pan American
Journal of public Health Journal and Waste Management reviewer.

Harshal Wadhwani
SGSITS College, India

Scope of artificial intelligence in pharmacy

Information and significance of Artificial intelligence in healthcare industry, its applications, examples, AI used around the world, drug delivery through use of tools requiring intelligence, using AI powered tools in research, AI assisted surgeries.

Take Away Notes:

- This will provide insight on how to implement artificial intelligence in research areas, drug delivery taking examples of present investments going on all over world.

Biography

Harshal Wadhwani pharmacist and chef at Wellwisher Foods completed graduation in pharmacy in 2018 at SGSITS, Indore, India. She then researched on her thesis work titled " Hydrotropy and mixed solvency concept in formulation of oral liquisolid systems and its evaluations during her post grad from RGPV University. She then worked as Pharmacovigilance associate and joined her own food start up named Wellwisher Foods which focusses on using herbal, natural foods for consumption improving health and immunity. She has also achieved an online masters course degree in Artificial Intelligence.

Durjoy Majumder
West Bengal State University, Kolkata, India

CSS, a dynamical models for the selection of individual patient specific cancer therapy

Different chemotherapeutic strategies like Maximum Tolerable Dosing (MTD), Metronomic Chemotherapy (MCT), and Antiangiogenic (AAG) drug are available; however, the selection of the best therapeutic strategy for an individual patient remains uncertain till now. Several analytical models are proposed for each of the chemotherapeutic strategies; however, no single analytical model is available which can make a comparative assessment regarding the long-term therapeutic efficacy among these strategies. This, in turn, may limit the clinical application of such analytical models. To address this issue here we developed a composite synergistic system (CSS) model. Through this CSS model, comparative assessment among the MTD, MCT, and AAG drug therapy can be assessed. Moreover, these chemotherapeutic strategies along with different supportive therapies like Hematopoietic Stem Cell transplantation (HSC), cellular immunotherapy as well as different combinations among these therapeutic strategies can be assessed. Fitting of initial clinical data of individual clinical cases to this analytical model followed by simulation runs may help in making such decision. Analytical assessments suggest that with the considered tumor condition, MCT alone could be more effective one than any other therapeutics and/or their combinations for controlling the long-term tumor burden.

Take Away Notes:

- Scientific community can use this in silico method in the pharmacological evaluation.
- Developed method is targeted towards Computational Medicine which has an impact in pharma-industry and possibly such method will have an impact in 4iR.
- This work can be expanded towards the development of a unified analytical model for cancer therapy.
- This provides a practical solution towards identification and rationalizing of a specific therapy.
- This work surely add accuracy in therapy design.

Biography

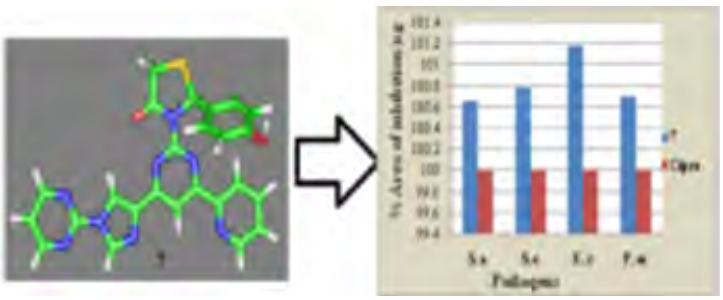
Dr. Durjoy Majumder, Assistant Professor of Physiology, West Bengal State University, received his Ph.D. in 2006 from Biophysics & Structural Division of Saha Institute of Nuclear Physics. He gained medical research training from the School of Tropical Medicine, Kolkata and Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow. Before joining to present position he hold a faculty position in Faculty of Engineering at IIEST, Shibpur. His research interests include cancer systems biology, systems pharmacology and in the area, his group has developed a new philosophical outlook called “Middle-out Rationalistic Approach” for cancer systems. He has more than 50 research publications.

Mohammad Arshad

Dawadmi, Shaqra University, Saudi Arabia

Synthesis, characterization, biological, and molecular docking assessment of bioactive 1,3-thiazolidin-4-ones fused with 1-(pyrimidin-2-yl)-1H-imidazol-4-yl) moieties

A series of fifteen computationally bioactive 1,3-thiazolidin-4-ones fused with 1-(pyrimidin-2-yl)-1H-imidazol-4-yl moieties (1–15) were synthetically prepared and assessed for antimicrobial potential against the four strains (two gram-positive and two gram-negative). The structures of the compounds were supported by spectroscopic methods like FT-IR, NMR (1H & 13C), mass spectroscopy, etc. The antimicrobial efficacy of the prepared compounds was achieved by the method of disk diffusion, and the findings were recorded in terms of zone of inhibition and minimum inhibitory concentration. Dimethyl sulfoxide and ciprofloxacin were used as negative and positive controls. The results stated that two compounds (7 and 10) were reported to exhibit better antimicrobial activity than the standard drug ciprofloxacin, while the other members represented considerable potential. Molecular docking was also performed to support the in vitro antimicrobial results, to understand the extent of H-bonding and the binding affinities of the compounds (1–15), with the amino acid residues of the receptor GlcN-6P and, represented significant H-bonding. The MTT assay was also carried out to see the toxic effects of the prepared compounds and posed that the compounds were less toxic toward the HepG2 cells.



Take Away Notes:

- The audience will have an overview on the synthetic medicinal chemistry, and to establish an interdisciplinary approach in terms of finding out a novel antimicrobial candidate.
- As these compounds are bioactive in nature, therefore it is obvious that the recent study can be carried out further by other scientist, such as in vitro screening, formulation of a drug or some other biological studies.
- This research can be used by other faculty to expand their research using the similar procedure for other compounds or similar approach to other parameters as well as can be used for updating the knowledge on the recent approaches for teaching.

Biography

Dr. Mohammad Arshad, has been awarded the Ph. D degree in January, 2014 on the thesis entitled “Novel heterocyclic compounds as potential therapeutic agents: Synthesis and Characterization” from Jamia Millia Islamia, India. He has published more than 50 research article and presented his work in various National/ International seminars and conferences. He has been awarded national fellowships from University Grant Commission, Govt of India and Council for Scientific and Industrial Research, Govt of India. He has acted as Principal Investigator on some project granted by Shaqra University, Saudi Arabia. Currently, he is working as an Assistant Professor (Chemistry) at Shaqra University, KSA.

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KEYNOTE FORUM

DAY 03

5TH EDITION OF
GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

28-30 MAR

Raphael Nudelman

Teva Pharmaceuticals, Israel

Setting limits for complex nitrosamines

Nitrosamine impurities have been in the center of the stage of impurities in drug products for the past 3 years. Regulators and industry have been deliberating the methods for determining limits for this special class of mutagenic/carcinogenic impurities. Preliminary guidelines have been published by regulatory agencies, however, they lack guidance on how to set limits for API-related nitrosamines, also known as “Complex Nitrosamines”. My presentation will discuss the ongoing activities to come to a consensus between the regulatory agencies and the pharmaceutical industry on what is the adequate process to set acceptable intake limits for the complex nitrosamines.

Take Away Notes:

- This presentation should assist in understanding the current gaps in the regulatory guidances for setting limits for complex nitrosamines
- Several tools will be suggested in order to set acceptable intakes for nitrosamines that do not have sufficient carcinogenicity data

Biography

Raphael has over 20 years of pharmaceutical industry experience. He has a Ph.D. in organic chemistry from the Weizmann Institute of Science in Israel, a post-doctorate at the US Air Force Research Lab in Aberdeen Proving Ground, Maryland, and another post-doctorate at Duke University Medical Center, North Carolina. In 2001 he joined a startup biotech company in Israel that performed rational drug design by molecular modeling, and in 2003 Raphael joined the Medicinal Chemistry department at Teva Pharmaceuticals. In 2010 he established the Chemical & Computational Toxicology group in Teva, which he headed until mid-2021. Raphael now holds the position of Senior Director Impurity Expert in the R&D Operations department. Raphael’s main topics of expertise are impurity and excipient qualification in drug substances and drug products.

Amelia Pilar Rauter

University of Lisbon, Portugal

Exploring carbohydrates for infection - A new hope

In the search for new antibiotics with new mechanisms of action to overcome bacterial antibiotic resistance, we present our results based on sugar-based bactericides targeting membrane lipid polymorphism. The mode of action involves membrane permeabilization by local induction of inverted hexagonal phases. The sugar structure is key for the bactericidal activity and for preventing bacteria resistance as cell envelope ultrastructures cannot easily change without substantial loss of function.

Take Away Notes:

- Is this research that other faculty could use to expand their research or teaching? Yes
- Does this provide a practical solution to a problem that could simplify or make a designer's job more efficient? Yes
- Will it improve the accuracy of a design, or provide new information to assist in a design problem? Yes

Biography

Prof. Dr. Amélia Pilar Rauter graduated in Chemical Engineering at the Universidade Tecnica de Lisboa. Started her academic career as Vertragsassistent of the Technische Universitaet Graz in Austria, and received her Ph.D. in 1982. After one more year, she obtained a position as Lecturer of the Faculdade de Ciências, Universidade de Lisboa, pursuing her academic career in this University. She is Full Professor of Organic Chemistry (retired in July 2020), the President of IUPAC Division of Organic and Biomolecular Chemistry, the President of the International Carbohydrate Organisation and the Secretary of the European Carbohydrate Organisation. She is the founder of the Portuguese Society of Chemistry Carbohydrate Group, and the founder and leader of the CQE Carbohydrate Chemistry Group at Faculdade de Ciências, Universidade de Lisboa (FCUL). She has more than 400 publications.

Villicana AM[1], Ponce YG[1], Grande D[2], Bravo JMC[3], Lópe AZ[1], Joaquín MCG[1], Santoscoy ARC[4], González JAP[3], Nina B[5], González GLP[3], Gómez LJV[3]*

[1]Technological Institute of Tijuana, Mexico

[2]Institute of Chemistry and Materials Paris, France

[3]University of Baja California, Valle de las Palmas Unit, Tijuana, Mexico

[4]School of Engineering and Sciences, Mexico

[5]University of Mexico, Ensenada, Mexico

Antimicrobial electrospun nanofibers for wound dressings

Wound dressing technology is of major interest in the actuality in order to avoid undesired effects when burns or skin wounds are treated, especially their risk for microbial contamination and subsequent infection. Hence, silver nanoparticles had claimed importance as an antimicrobial agent and their use have been increased in the biomedical field. For these reasons, a comparative study of different methods to synthesize electrospun polymeric fibers loaded with silver nanoparticles (PCL/PVP-AgNPs) was investigated and performed, such as direct blending, ultraviolet irradiation, thermal treatment, and silver mirror reaction methods, the time when the silver nanoparticle's precursor was added was also taken in consideration and its antimicrobial efficiency is reported as well. The morphology, structure, and size of the fibers were obtained using the scanning electron microscope (SEM) where the loading of the AgNPs in the fibers and its distribution was demonstrated. Fourier transform infrared spectroscopy and Raman spectroscopy was used to measure the physicochemical properties of the fibers. The dynamic light scattering study made it possible to measure the size of the nanoparticles and the surface charge of the samples. The antimicrobial study was carried out for 24, 48, and 72 h in Gram-positive *Staphylococcus aureus* and Gram-negative *Escherichia coli* bacteria. Cytotoxicity was evaluated with the MTT assay using HFF-1 human fibroblast cells. The results showed that the method with the best antimicrobial effect in both bacteria is the one where a reduction by ultraviolet light irradiation was performed to load the AgNPs and the AgNPs precursor was added before the electrospinning process. In SEM micrographies, the best distribution of AgNPs on the fiber was observed in the silver mirror reaction method, but the UV radiation method promotes this distribution efficiency, the physicochemical properties obtained were desirable, the particle size falls within the range to be considered nanoparticle (~17 nm). These results determined the best method to prepare antibacterial wound dressings.

Take Away Notes:

- Innovation on wound dressings
- Applications of electrospinning technique
- Innovation on drug delivery administrations

Biography

Dr. Luis Jesús Villarreal-Gómez, studied Chemistry-Biology at the University of Sonora, Hermosillo, México and graduated in 2004. He then received his PhD degree in 2013 at the University Autonomous of Baja California, Tijuana, México where he joined as full research professor. Dr. Villarreal is founder and editor in chief of the Revista de Ciencias Tecnológicas (RECIT) (ISSN 2594-1925) and is editorial board member of several journals edited from MDPI, Hindawi, BenthamOpen, amongst others. Until now, he been published 32 papers and have been reviewed more than 120 reviews. His research lines are biomaterials, tissue engineering, drug delivery systems and biotechnology.

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SPEAKERS

DAY 03

5TH EDITION OF
GLOBAL CONFERENCE ON

PHARMACEUTICS AND NOVEL DRUG DELIVERY SYSTEMS

28-30 MAR

Nahlah Elkudssiah Ismail
Malaysian Academy of Pharmacy, Malaysia

Malaysian journey of COVID-19 vaccine administration

The first case of COVID-19 was reported in Malaysia on 25th January 2020. Since then, multiple series of COVID-19 waves occurred with different SARS-CoV-2 variants of concern dominating. The pandemic COVID-19 hit Malaysia with total cases of 3,528,557 and RT value of 1.02 were reported on 4th March 2022. To curb the pandemic, National COVID-19 Immunisation Programme (PICK/NIP) that began on 24th February 2021 aimed to build herd immunity among Malaysian residents in less than a year. Based on open data sources of collaboration between COVID-19 Immunisation Task Force, Ministry of Health (MOH) Malaysia and the Open Data Community, till 4th March 2022, total 67,576,623 doses of vaccine COVID-19 been administered among Malaysian populations of children (5 – 11 years old), adolescent (12 – 17 years old), adult (18 – 64 years old) and geriatric (≥ 65 years old). Five main vaccines of different pharmaceutical companies involved namely Comirnaty® and Tozinameran® of Pfizer-BioNTech, CoronaVac® of Sinovac, ChAdOx1-S® of Oxford-AstraZeneca, Convidecia® of CanSino, and COVILO® of Sinopharm. The National Pharmaceutical Regulatory Agency (NPRA) under the MOH Malaysia persistently monitoring safety risk of all aforementioned registered vaccines in Malaysia administered as dose 1, dose 2, dose 3 and/or booster accordingly, via adverse events following immunisation (AEFI) reports received. In total, 25,610 AEFI reports received for evaluation. The rate of AEFI reporting via NPRA AEFI system was 379 AEFI reports per 1 million COVID-19 vaccine doses. Malaysia is currently in the verge of transition period between pandemic to endemic COVID-19 state, by "living with COVID-19" begin 1st April 2022.

Take Away Notes:

- Malaysian Journey of COVID-19 Vaccine Administration
- Herd immunity development among residents
- Adverse events following immunisation
- From pandemic to endemic COVID-19 state

Biography

Prof. Dr. Nahlah Elkudssiah Ismail studied Bachelor of Pharmacy (Hons) at Universiti Kebangsaan Malaysia, Malaysia and graduated as R.Ph. in 2000. She then joined the research group of Prof. Henry Chrystyn at the School of Pharmacy and Institute of Pharmaceutical Innovation (IPI), University of Bradford, United Kingdom (UK). She received her PhD degree in 2005 at the same institution. After 8 years working in Universiti Teknologi MARA Malaysia, she was promoted the position of an Associate Professor at Lincoln University College Malaysia in 2015. Following year, she was appointed to a Professor in Clinical Pharmaceutics at MAHSA University. Currently, she is the Council Member of Malaysian Academy of Pharmacy. She is also enthusiastically advocating vaccination against COVID-19 by becoming one of the healthcare professional frontliners at various vaccine administration centres (VACs) for populations of adult, geriatric, adolescent and children. She has published more than 250 publications including research journal articles, proceedings, chapters in books, books and magazine.

Yimam Getaneh Misganie[1,2] *, Kuntaman Kuntaman[1], Dominicus Husada[1], Maria Lucia Inge Lusida[1]

[1]Universitas Airlangga, Indonesia

[2]Ethiopian Public Health Institute, Ethiopia

Highly active antiretroviral treatment (HAART) induced hepatotoxicity among HIV positive population: Systematic Review

Background: The advent of HAART dramatically reduced the clinical impact of HIV infection. Dual Nucleoside Reverse Transcriptase Inhibitors (NRTIs) with either protease inhibi¬tors (PI) or Non-nucleotide/s Nucleoside Reverse Transcriptase Inhibitors (NNRTIs) are the backbones of antiret¬roviral therapy regimens. HAA RT-induced liver injury has appeared as a primary cause of death in HIV infected patient as a result of the high HIV prevalence and due to the late HIV diagnosis and late initiation of HAART. The high rate of HBV and HCV co-infection in sub-Saharan African countries could hinder the treatment outcome of HAART. This review considers hepatotoxic effects of the different classes of HAARTs and assesses the risk factors associated with hepatotoxicity in HAART treated patients.

Method: A three-step search strategy was utilized in this review. Initial search of Pub Med central and Google scholar was undertaken, this search was to address published studies with key words antiretroviral therapy, liver, toxicity and HIV positive. A second search using all identified keywords including biomarkers of hepatotoxicity (ALT, AST, Creatinine, ADR) Thirdly, the reference list of all identified reports and articles were searched for additional studies. People living with HIV with intervention HAART and a control group of HAART Naïve population while the outcome was organ toxicity. We considered 22 qualitative and 47 quantitative studies included for this review. Qualitative data was extracted from papers included in the review.

Result: A study conducted in Debrebirhan Hospital, Ethiopia, revealed, 25% of clients in HAART treated groups and 9.2% of treatment naïve controls had showed liver enzyme changes while other study reported no significant variation (20.1% Vs. 22.0%) among HAART experienced and HAART na¨ıve patients. In a study conducted in US, the incidence of HAART-related severe hepatotoxicity is estimated at 10% and a report from Latin American children estimated 3.2% in children on non-PI regimens and 1.5% among children receiving PI-based HAART. In Asian children 2.68% had FIB-4 score >1.3 prior to HAART and 0.73% developed FIB-4>1.3 during HAART follow-up. Mitochondrial toxicity is a prevailing explanation for hepatotoxicity among patients treated with NRTIs (stavudine, didanosine and zalcitabine). Hypersensitivity reaction associated with Abacavir may be accompanied by liver failure. In vitro study revealed toxicity zalcitabine≥didanosine>stavudine>lamivudine>zidovudine>abacavir. NNRTIs are associated with higher incidence of hepatotoxicity in patients treated with NVP as com¬pared with EFZ. One study found a higher incidence of severe hepatotoxicity in patients on ritonavir (OR, 6.2; 95% CI, 2.8-13.7). Other study revealed ritonavir was associated with a significantly higher incidence of severe hepatotoxicity versus other PIs in the first 6 months of therapy. Study of 1,325 patients confirmed the association of indinavir use with severe hyperbilirubinemia at 6 months, 12 months, and 24 months of ART. Ritonavir was associated with a significantly higher incidence of severe hepatotoxicity versus other protease inhibitors. Combination of ritonavir with coinfection HBV or HCV was a 2.78 and 2.46 fold increased risk for liver toxicity. HAART induced hepatotoxicity were associated with recent discontinuation of lamivudine (OR=6.8; 95%CI=2.1-22.7), recent start of nevirapine (OR=9.6; 95%CI=3.2-28.3) recent start of ritonavir (OR=4.9; 95%CI=2.0-12.1). Other risk factors for hepatotoxicity were older age, female gender, African American ethnicity, CD4 count of <200 cells/mm3 and co-infection.

Conclusion: Evidence on the impact of HAART on hepatotoxicity was controversial. However, predominant and wider scope studies concluded certain classes of antiretroviral cause hepatotoxic reactions. Liver function should therefore be monitored on a regular basis in patients with HIV receiving any antiretroviral agent. Close monitoring of co-infected patients could contribute to better out come from HAART. There were limited studies among children and adolescent while the available ARV drugs were not validated on the safety and efficacy for this group of population. Validation of combination therapies on safety and efficacy prior to use could be important.

Take Away Note:

- Considering safe drug to end users
- Consider marginalized and highly affected group of population while delivering drugs
- Antiretrovirals are a combination to triple drugs and this recommends for re-designing in to single therapy to minimize safety concerns by the drugs
- Further studies can be done in a different setting

Biography

Yimam Getaneh is currently a PhD fellow in Biomedical Science from Universitas Airlangga, Surabaya Indonesia, also MSc graduate in Biomedical Science from Bahir Dar University Ethiopia. He is also currently working for the Ethiopian Public Health Institute as senior researcher. Since 2013, Dr. Yimam concluded and published more than 32 nationally representative research projects specific to HIV drug resistance. His PhD project is also on toxicity and HIV drug resistance among people taking antiretroviral therapy in Ethiopia

Shubhangi BS[1]*, Patil SV[2]

[1]Mane College of Pharmacy, Maharashtra, India

[2]Ashokrao Mane College of Pharmacy, India

Forced degradation studies of drospirenone and in silico toxicology predictions for its new designated impurities

Aim and Objective: To remain safe for further processing or human consumption, study of stressed degradation for the identification of feasible degradants is required. The stability indicating high performance thin layer chromatographic method was developed by using Camag HPTLC system.

Materials and Methods: Silica C60F254 precoated TLC plates were used as stationary phase for separation of degradation products. The optimized mobile phase system consisted of toluene: methanol: diethylamine (7:3:0.1) at 280 nm.

Results: From the mass details and IR, NMR interpretation, the plausible structure of alkaline degradation product of drospirenone could be 17α (3-hydroxy propyl)-6β, 7β, 15β, 16β-dimethylene-5β-androstane-3β,5,17β triol and acidic degradation product of drospirenone could be 3-oxo-15α,16α-dihydro-3'H-cyclopropa[15,16]-17α-pregna-4,6-diene-21,17-carbolactone. Also *In Silico* toxicity studies of the degradation products were performed to assess the toxicity profile of the products using Protox online sever.

Conclusion: This analytical method can be considered as an alternative practical and inexpensive method for simple, accurate and efficient quantitative detection of drospirenone in the presence of its degradation products.

Keywords: Drospirenone, Characterization, Forced degradation studies, *In Silico* toxicity study.

Take Away Notes:

- Audience will learn about the stability of the drug is the capability of the pharmaceutical dosage forms to sustain the physicochemical, therapeutic as well as microbial properties throughout the time of storage and usage by the patient. Stress testing of drug substance or drug products is helpful for the finding the possible degradation products, likely the degradation pathways also the intrinsic stability of the drug molecule. Stress study aims to identify with the effect of severe conditions such that moisture, heat, pH, oxidation as well as light of molecules.
- Identification with characterization of stressed products by using liquid chromatography-mass spectrometry is of use in the development of stable formulations.
- Yes. The myriad of chemical and physical tests provide result concerning the purity, potency, identity, efficacy, physical characteristics and overall quality of drug substance and the drug product which are integral part of drug development and commercialization strategy as it moves through the new drug life cycle.
- Yes, it improve the accuracy of a design, or provide new information to assist in a design problem.
- One of the areas of current pharmacoeconomics and clinical interest is the identification and characterization of stressed degradation products and impurities of new drugs using optimum time and resources. In such work adequate separation, selectivity, sensitivity of detection and accurate quantitation are always the primary concern of pharmaceutical analyst.

Biography

Dr. Shubhangi studied Pharmacy at the Shivaji University, Kolhapur, India and graduated as M.Pharmacy in 2011. She received her PhD degree in 2021 at the Shivaji University, Kolhapur, India. She is having more than 15 years of teaching and research experience. She has published 16 research papers in International and National journals and presented her research work in several national and international conferences.Presently she is working as Associate Professor at Ashokrao Mane College of Pharmacy, Peth-Vadgaon, Kolhapur, India.

Manisha Mandal
MGM Medical College, India

Molecular docking and dynamics simulation of effects of key mutations in SARS-CoV-2 spike protein RBD in complex with human ACE2 with with a nolide an inhibitor

Background and objectives: Different countries, including India witnessed sharp increase in SARS-CoV-2 cases and deaths associated with a rising proportion of B.1.617 variant. The strain was characterized by L452R and E484Q primary mutations in the receptor binding domain (RBD) described as the mutation of concern. However, the biophysical basis for comprehending the molecular mechanism causing the increase in the infectivity rate and immune evasion ability of the mutant in relation to wild-type (wt) SARS-CoV-2, are very scanty. The aim of the current study was to evaluate the effect of mutation on the molecular dynamics, energetics, antigenicity, interactions and binding affinity of RBD of the spike (S) glycoprotein in complex with human ACE2 receptor with withanolide A ligand.

Methods: The C-terminal domain of SARS-CoV-2 S protein RBD in complex with human ACE2 (PDB ID: 6LZG) and SARS-COV-2 P2B-2F6 murine monoclonal antibodies (mAbs) with RBD (PDB ID: 7BWJ) were retrieved from RCSB PDB (http://www.rcsb.org//pdb). The 3D structure of withanolide A (PubChem CID: 11294368), used as ligand, was retrieved from PubChem database (https://pubchem.ncbi.nlm.nih.gov/). The L452R and E484Q point mutations were introduced into the RBD chain using VMD (http://www.ks.uiuc.edu/Research/vmd/). The binding affinities towards mutant and wildtype RBD were compared for withanolide A, ACE2, P2B-2F6 mAbs using AutoDock Vina (https://www.cgl.ucsf.edu/chimera/) and Haddock (www.bonvinlab.org). The ADMET and drug-likeness properties of withanolide A was determined using SwissADME (http://www.swissadme.ch/) and pkCSM (http://biosig.unimelb.edu.au/pkcsm/prediction). Antigenic propensity of the wt and mutant proteins were predicted using antigenic peptides tools (http://imed.med.ucm.es/Tools/antigenic.pl). Molecular dynamic simulation and post trajectory analysis was done for: the mutant and wildtype RBD bound with or without ACE2 in complex with withanolide A, and the free withanolide A (in water) using Gromacs 2021 (www.gromacs.org). Free energy of binding was computed using MM-PBSA approach. The above computations were performed in Ubuntu 20.04.2 LTS 64-bit OS, 3.36.8 Gnome version.

Results: Molecular docking demonstrated binding energy -10.3 and -11.2 kcal/mol for withanolide A with wt and mutant RBD bound to ACE2, respectively. The wt RBD not bound to ACE2 displayed binding energy -7.7 kcal/mol with withanolide A. The ACE2 and P2B-2F6 mAb showed binding affinity of -12.4 and -9.6 kcal/mol, respectively with wt RBD. No violation of Lipinski's RO5, favourable ADMET properties and bioavailability scores (0.55) signify the suitability of drug-likeness for withanolide A. Molecular dynamic simulation revealed the root mean square deviation (RMSD) and root mean square fluctuations (RMSF) of ~0.05 nm for withanolide A. The RMSD and RMSF of wt and mutant RBD not bound to ACE2 in complex with withanolide A were ~1.00 and ~0.5 nm, respectively. The RMSD and RMSF of wt and mutant RBD bound to ACE2 in complex with withanolide A were ~2.00 and ~1.4 nm, respectively. The net free energy of binding for the wt and mutant RBD bound to ACE2 were -104.18 and -108.21 kJ/mol, respectively, with withanolide A. The net free energy of binding for the wt and mutant RBD not bound to ACE2 were -16.66 and -17.68 kJ/mol, respectively, with withanolide A. The key amino acid player in protein-ligand interactions was Ile291 through H-bond in both wt and mutant RBD bound to ACE2 in complex with withanolide A consisting fewer hydrophobic interactions in the latter. Following structure analysis, P2B-2F6 mAb identified a linear epitope located in residues E466 - D492, which overlapped with ACE2 binding sites in mutant and wt RBD.

Interpretation and conclusions: The mutant RBD bound to ACE2 in complex with withanolide A was energetically more stable than the wild type strain, and the mutant/wild type RBD not bound to ACE2 in complex with withanolide A. Insignificant changes in the antigenic propensity of RBD protein with or without ACE2 receptor and their mutants

were found. The results suggested that the L452R and E484Q mutations in RBD of the SARS-CoV-2 B.1.617 variant improved the stability of S protein, with future implications for vaccine development and application.

Keywords: SARS-CoV-2 RBD, human ACE2, withanolide A, molecular dynamic simulation, molecular docking, binding energy, ADMET profile.

Biography

Dr. Manisha Mandal has her expertise in the field of probiotics research, molecular epidemiology of infectious diseases, bioremediation of pesticide using bacterial system for pollution abatement, data analysis using bioinformatic approaches towards drug development, disease modelling, and next generation sequencing. She has published more than 70 research articles in her research field in different journals, one book, and presented several papers in different conferences.

Smita More[1]* and Dhananjay More[2]

[1]Savitribai Phule Pune University, Pune, India

[2]Arrotex Pharma, Pune, India

Taste masking of pediatric formulation using HME

Present study aims to utilize low temperature hot melt extrusion (HME) as a novel technology to mask bitter taste and also to develop a flexible and palatable solid oral dosage form to improve patient compliance. Pediatric patients need different oral dosage forms than adults due to differences in swallowing capabilities, taste likings, and dosage requirement. A manipulation in adult dosage form is often required to make it suitable and acceptable by pediatric patients. There are certain requirements and issues while administering existing pediatric dosage forms like requirement of dose measuring devices, chances of incorrect dosing, shaking requirement for dose accuracy in liquid dosage form and capability to administer whole quantity of formulation, chances of chewing and choking, limited dose flexibility, taste masking requirements, less stability of dosage form which instigate parents to do the manipulations.

So, there is a need to develop ready to take palatable and flexible solid formulation for children through oral route which do not require manipulations while administration and must be extremely pleasant and easy to administer.

Take Away Notes:

- Novel taste masking techniques.
- Audience will be able to understand taste masking approach which will be utilized in formulation development.
- Yes, research can be expanded.
- Yes you can apply practically on volunteers and check the efficacy of dosage form.
- Yes the dosage form will provide effective taste masking which will help in designing a new dosage form.
- These formulations will provide effective taste masking, which will make the dosage form palatable and acceptable by pediatric patients

Biography

Dr. Smita More studied Pharmaceutics at Dr. DYPatil College of Pharmacy Pimpri at the Savitribai Phule Pune University, Pune and done PhD from JNTU, Hyderabad. Currently I am working as Associate professor at PES Modern College of Pharmacy (For Ladies) Moshi in department of Pharmaceutics. I have total 16years experience in teaching and research. I have supervised 15 MPharm students and currently guiding PhD students. I have numerous publications and also have done oral and poster presentations.

Vikas Shrivastava
Amity University, Madhya Pradesh, India

Bio-assisted synthesis of bi-metallic nanoparticles: Challenges and future prospects

Bimetallic nanoparticles comprise two definite metals, having characteristic amalgamation and chemical chronology that give them unique geometry and specific functions. Bi-metallic nanoparticles also referred as doped nanoparticles show increased solubility with reduced particle size thereby surpassing monometallic nanoparticles in functionality as these characteristics improve their bio-sensing, catalytic, anti-bacterial and wound-healing properties. These nanoparticles can be synthesized by various ways such as physical, chemical or biological processes. Among all, biological methods are considered to be most suitable as they are environment friendly and economically viable. Bio-assisted synthesis of nanoparticles also called 'Green synthesis' is achieved though plants and microbes, be it gymnosperms or angiosperms, and microbes can be bacteria or fungi and yeast or even viruses. In this study, we focused on usage of medicinal plants as they contain bio-active compounds like several phytochemicals which hold antibacterial traits that in turn aid in enhancing antibacterial aspect of bi-metallic nanoparticles. Due to this property, bi-metallic nanoparticles are being used as an antibiotic substitute to target particular Microorganisms. Several microorganism associated diseases are a significant reason for constant contaminations and mortality due to multidrug-resistant bacteria which mostly occurs due to biofilm formation by the bacteria. Bio-synthesized nanoparticles have shown potent anti-microbial properties against wound-associated pathogens which cause delay in healing specially in patients with diabetes due to poor replications of immune cells thus, require keen observation and immediate management. All this can be best achieved by bio-assisted bi-metallic nanoparticles which have an additional advantage of reduced toxicity because of doping and use of plant based phytochemicals. We are using several medicinal plant leaves extracts and then synthesized bi-metallic silver doped metal nanoparticles such as silver doped zinc, silver doped copper etc. followed by discerning their anti-microbial, anti-biofilm and wound-healing capabilities against biofilm forming pathogenic bacteria which was isolated from environment and clinical sources. This study can open new doors in field of medicine thereby furnishing new choices in treating ailments by providing bio-assisted doped nanoparticles as wide-spectrum anti-biofilm and wound-healing agents to foster a comprehension for the improvement in nano-based medication formulations.

Take Away Notes:

- Other faculty members can surely inculcate their knowledge in expedition of diseases involving more and more biofilm forming pathogens causing a number of diseases that are hard to treat with using traditional antibiotics due to the problem of multi-drug resistance.
- Practical solution is surely sustainable with efficiency in designer's job as bio-assisted synthesis of nanoparticles and eventually drugs based on them are easy to handle with as they do not involve any toxic chemicals in synthesis as well as by-products and are also carried out at normal temperatures thus, making it more coherent and feasible to deal with.
- Accuracy of design can be assured by finding out the type of nanoparticle synthesized i.e. whether they are core-shelled, alloyed or cluster in cluster (which are the several types of bi-metallic nanoparticles) by finding out the reduction potential of two metals involved in synthesis of doped bi-metallic nanoparticles thus giving new insight in nano-based drugs formulation and usage.

Biography

Prof. (Dr.) Vikas Shrivastava, Ph.D. is Professor in Amity Institute of Biotechnology, Amity University Madhya Pradesh, Gwalior. He obtained his Ph.D. in Biochemistry from Cancer Hospital & Research Institute, Jiwaji University, Gwalior. He has more than 20 years of teaching and research experience. He has published more than 45 research papers in various journals of International and National repute. He has been granted 01 patent from The Patent Office, Govt of India and published 01 patent in the Patent Journal of India. In addition, he has filed 04 patents to India Patent Office. He has also published 02 books in the form of lab manuals and 01 book chapters. He has co-supervised one Ph.D. scholar for the award of Ph.D. in Biotechnology and currently supervising 05 Ph.D. scholars. He has presented papers in various national/ International Conferences. Presently, Professor Shrivastava is involved in the designing and synthesis of multifunctional nanomaterials by chemical & biological route & clinical biochemistry. He is member of various International and National Scientific bodies.

Rajani Chauhan

Banasthali Vidyapith-University, India

Digital drug marketing

The title of the talk include the information available in print media and e- media. The journey of Digital Drug Marketing was started in 1997 as Food and Drug administration, released guidelines for "Direct-to-Consumer (DTC)" advertising in this year. The talk will include sub topics related to title - like Personal Data Collection and Privacy, Condition and Behavioral Targeted Advertising, Neuromarketing, Social Media Monitoring and Marketing, Unbranded Sites, Audience Segmentation, Mobile Campaigns, Search Engine optimization, Pay per click ads, E-mail News letter, Companies in digital marketing, Potential outcome of digital drug marketing, Organizational changes for digital drug delivery, Non-Pharmaceutical Interventions (NPIs), Therapeutic area for digital drug delivery, COVID-19 and digital drug delivery and Organizations offering courses in Digital Drug marketing.

This talk will enabel the audience with new upcoming opportunities in the field of Drug marketing. Audience may try to increase the potency of selling their products in the market with more ease and with consumer compliance. In this talk, various methods for of Digital drug marketing has been discussed. Listener may choose the most comfortable method of Digital Drug Marketing method in the first attempt. As the audience feel comfortable in one type of marketing s/he may attempt other methods of digital marketing. This topic will be very beneficial for those who opt business field after completing the courses related to drug manufacturing. This talk will provide a solution to the audience to increase the market of manufactured drugs. Digital Drug marketing always follows the ethics designed by government of that country. So accuracy in the design of such advertising will be must as per government Rules.

Take Away Notes:

- Recent method of Digital Drug Marketing
- Future methods of Digital Marketing
- Organisations providing education regarding Digital Marketing

Biography

Rajani Chauhan, Joined Banasthali Vidyapith-University in 2006 as Lecturer and in 2011 completed PhD program from the same university and till date serving in the same University at the capacity of Associate professor. The programs she have under her charge Coordinator of National Service Scheme and Unnat Bharat abhiyan (UBA) and Nodal officer for the UBA. Till date she and her reasech students have Projects, funded by various government agencies. Under her superviosn students awarded with PhD Degree are 14, PG students dissertations 25 and UG projects 5. She have Reacearh article in jouranls of National and International Reputes.

Ravindra S. Shinde
Dayanand Science College, India

Review on multicomponent synthesis of triazine thiazolidinone derivatives and evaluation of their biological activity

Recently, numerous heterocyclic compounds from the series of s-triazine and thiazolidinone have been synthesized and their pharmacological activity has therefore investigated. It has been accomplished that, s-triazine ring frame with thiazolidinone hold a extensive spectrum of biological and pharmaceutical activities. The s-Triazine thiazolidinone derivatives has played a fundamental role in unique drug innovation for modulating physical and biological properties of the molecule due to wide diversity of biological applications.

Biography

Ravindra S. Shinde, PhD, is presently serving as Assistant Professor, Department of Chemistry at Dayanand Science College, Latur, in Maharashtra, India. He has around 14 years of teaching experience at the BSc and MSc level. Having more than 23 research publications to his credit in journals of national and international repute, he is also the author of many undergraduate- and postgraduate-level books. He has published two books with Apple Academic Press: Green Chemistry and Sustainable Technology; Modern Green Chemistry and Heterocyclic Compounds, and one with Lulu Press, Inc. Morrisville, North Carolina: Practical Chemistry. He has also written chapters in books published by several other international publishers. Dr. Shinde has delivered lectures and chaired sessions at national conferences and is a reviewer for a number of international journals. In addition, he has completed minor research projects sponsored by different funding agencies. He is a university-approved recognized postgraduate teacher in chemistry. He has around one decade of administrative experience as National Service Scheme (NSS) programme officer, member of university exam committee, coordinator of a UGC-sponsored NET/SET coaching cell and One Teacher One Skill Committee of the college, and brand ambassador of online NPTEL examination run by Indian Institutes of Technology and Indian Institute of Science. He was awarded a number of prestigious awards during his career, such as Vidyabushan Puraskar by the Indian NET/SET Association (2010) and a National Teacher Award (2019).16 chapter in International Edited book. 4 book Editor. Editor of Apple Academic press Canada, Editor of Lulu Publishing press, Uk. Editor of schoolar press, USA. 2 Indian patent, 30 research papers.

Helena Freitas

Universidade de Lisboa, Portugal

Cannabinoid association with opioids in Cancer-related pain management therapy

Background: Cancer is the disease that causes the highest numbers of morbidity and mortality in the world, being one of the main symptoms chronic pain. Moderate and severe pain is usually treated with opioids, whose efficacy is proven but with several risks for the patient such as tolerance, dependence and overdose. Medical cannabis appears as a new hope for these patients in pain management. This study aims to understand whether the concomitant use of cannabinoids and opioids allows a more effective management of pain and reduce opioid use in cancer patients.

Methodology: This systematic review was done through a search in three databases (PubMed, Scopus and Web of Science) for published articles that included the concomitant use of cannabinoids and opioids for the treatment of pain in cancer patients. Systematic reviews and meta-analyses to avoid duplication of studies, studies in animals or other models and studies in which cannabinoids were used recreationally were excluded. The results were presented in a table indicating the results obtained, as well as the population under study.

Results: 10 studies between 2011 and 2021 with a total of 4963 participants were considered. The studies range from randomized controlled-trials, prospective surveys and a case study. Most studies have reflected benefits in pain control and reduced use of opioids, although they are not conclusive.

Discussion: The limitation of this study review is mainly based on the low number of studies pointing, however, to indications of the positive effects of the use of cannabinoids as adjuvants in the treatment of cancer-related pain.

Take Away Notes:

- This presentation aims to pave the way for a greater depth of knowledge about the capacity of new cannabis-based drugs to contribute to a decrease in opioid intake in patients suffering from chronic cancer-related pain.
- Doctors, pharmacists and nurses, especially in the area of palliative care, struggle with the need to adjust the dosages of opioids such as morphine or fentanyl, each time the patient shows tolerance to the prescribed dosage. The knowledge conveyed by this presentation leads to a possible way to deal with this situation
- This presentation aims to encourage other researchers to deepen research into the use of medical cannabis in palliative care.

Biography

Dr. Helena Freitas studied Pharmacy at Escola Superior de Tecnologia da Saúde de Lisboa and Pharmaceutical Sciences at Pharmacy Faculty in Lisbon University with a master's degree in Pharmaceutical sciences under the thesis "Use of biopharmaceuticals in colorectal cancer" in 2016. In 2020, she began her Phd in Science of Sustainability at the University of Lisbon, with the theme "Impacts of Medical Cannabis Production in Portugal: a legal, economic and environmental assessment". Dr. Helena Freitas has worked in several areas of pharmaceutical science, such as community and hospital pharmacy, palliative care, and performed professional internship in the laboratory area.

Qayed WS[1], Mostafa AH[1], El-SayedWM[2], Tarek Aboul Fadl[1]*

[1]Assuit University, Egypt

[2]Ain shams University, Egypt

Novel azine linked hybrids of 2-indolinone and thiazolodinone scaffolds as CDK2 inhibitors with potential anticancer activity

In recent years, cell cycle and checkpoint pathways regulation are offering new therapeutic approaches against cancer. 2-Indolinone, is a well exploited scaffold in the anticancer domain. Accordingly, the current work describes merged structural hybrids and ligand based design and synthesis of novel derivatives of (Z)-3-substituted-2-(((E/Z)-5-substituted-2-oxo-1-substituted-indolin-3-ylidene)hydrazin-ylidene)thiazolidin-4-ones. These hybrids were tested *in vitro* for their cytotoxicity against three human epithelial cell lines, liver (HepG2), breast (MCF-7), and colon (HT-29) in addition to the diploid human normal cells (WI-38) compared to doxorubicin as a reference drug. Variable cytotoxic effects (IC50 2.59 – 100 micromole) were obtained by these molecules on the three cancer cell lines with pronounced selectivity compared to the normal one WI-38. The most active compounds, with IC_{50} 2.59 – 9.17 micromole, were tested on the expression of four genes ; *p53*, *cdk2, caspase3*, and *topoisomerase II (topoII)* in HepG2 cells as cell cycle key genes for revealing the possible molecular mechanism(s) of their antiproliferative efficacy.

As a general pattern the tested compounds elevated the expression of *p53* and *caspase*3 by 4-5-folds, and downregulated the expression of *cdk2* and *topoII* by 47 - 56%, compared to untreated cells. It is worthy to note that these compounds exert their antiproliferative activity on more than one molecular target.

Apoptotic effect of the most active compound was further investigated using annexin V-FITC/PI dual staining assay and showed that cells treated with this molecule have nearly 18 folds greater effect than that of the control cells. Furthermore, inhibitory activity of the top active five compounds on CDK2 enzyme were tested and revealed that these molecules have comparable inhibitory activity to the reference drug sunitinib.

Take Away Notes:

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

Biography

Prof. Tarek Aboul-Fadl has completed his PhD in Medicinal Chemistry from Assiut University, Egypt (1994) under the channel system and joint supervision scheme between Assiut University and Josai University/Japan. He performed his postdoctoral training as a postdoctoral research fellow and scientist of Pharmaceutical and Medicinal Chemistry at University of Vienna, Austria (1997- 1998), Friedrich-Alexander-Universität, Erlangen-Nürnberg, Germany (1999 and 2013) and University of Utah, USA (2001-2002 and 2004-2005). He has over 77 publications and 4 patents that have been cited over 1880 times, and his publication H-index is 23(google_scholar). He awarded ACDIMA Research Award for the Best Scientific Research in Arab World, 2012.

Ahmet Dogan Ergin
Trakya University, Turkey

Nanobubbles and Applications

Microbubble and nanobubble technologies have gotten a lot of interest in recent years because of their vast range of applications in science and technology, including water treatment, biomedical engineering, and nanomaterials. There are also several intriguing physicochemical aspects that are currently unsolved, and numerous groups are still working on them.

Within liquids, nanobubbles (NBs) are gas-filled nano-sized particles. Surface nanobubbles (SNBs) and bulk nanobubbles (BNBs) are named after their locations in the solid/liquid interface and in the solution, respectively. Apart from that, micropancakes are shaped like spots with a width of several microns but a height of only 1-2 nm.

In the first part of the study, the difference, structure, production methods and characterization methods of surface and bulk nanobubbles will be mentioned. In 1950, where Epstein-Plesset proposed a theory to predict the lifetime of a single bubble as a function of the bubble radius and saturation. However, this theorem cannot explain the longevity of nanobubbles. For this reason, various theorems have been put forward. In our study, the stability of nanobubbles will be emphasized and the theorems related to their stability will be explained.

Their interesting physical properties and potential biomedical applications have led to a rapid increase in research in this area, demonstrated by search results of the term 'Nanobubble' into the Web of Science online database. Current studies range from previously described use as theranostic agents, pharmaceutical agents, fundamental studies on stability and behavior to nonpharmaceutical applications such as cleaning and agriculture. In the last part of the study, different and various application ways of nanobubbles will be explained with examples.

Take Away Notes:

- The audience will have information about nanobubbles.
- Nanobubbles are a emerging research field. Awareness will be increased in this area and new studies will emerge.
- Other faculties can add this study to their research topics.
- Information will be given about the different use of nanobubbles, as it allows nonpharmaceutical applications.

Biography

Dr. Ergin studied Pharmacy at the Marmara University, Faculty of Pharmacy, Turkey and graduated as BSc in 2012. He then started Ankara University, Faculty of Pharmacy, Pharmaceutical Technology Department. He received his PhD degree in 2019 at the same institution. After then, he worked in Regulatory Department in Turkish Medicines and Medical Devices Agency for one year. Currently he is currently working as an Assisstant Professor in Trakya University, Faculty of Pharmacy, Pharmaceutical Technology Department from 2020. He is working on nanoparticles, drug delivery systems, pharmacokinetic studies and nanobubbles.

Florjana Rustemi[1]*, Gezim Bocari[2]

[1]Albanian University, Tirana, Albania

[2]Luarasi University, Tirana, Albania

Antibacterial activity of dihydroanthracene disulfonic acid derivative against multiresistant mixed bacterial infection

This study presents the in vivo and in vitro activity of dihydroanthracene disulfonic acid derivative, a new preparation with patent DE102004003030 A1. The in vivo study was performed in a 61-year-old patient of the UHC "Mother Theresa" Tirana with colon resection and colostomy for colon adenocarcinoma, verified by biopsy examination, complicated with Necrotitizing Fasciitis. 24 incisions were performed in the dorsal part from which were observed bad odor pus and presence of necrotic tissue. The standard local treatment and general treatment with Cefazolini, Metronidazole, Gentamycini IV, in the first two weeks didn´t result effective. Microbiological analysis resulted in mixed flora with streptococci, enterobacteria, bacterium coli, proteus pseudomonas and anaerobes resistant to ampicilline, piperacillin, ceftazidime, imipenem and moderately sensitive to cotrimoxazole and azithromycin. Biochemical analyzes showed anemia and hepatic damage. After multidisciplinary consultation antibiotics were dropped. After the patient consent, the new preparation was used topically as 20% solution and orally 2 g/twice daily. The treatment was well tolerated. The patient's temperature dropped and elimination of the bad odor and reduced secretion were observed. Healing of the wounds lasted 3 months. in vitro evaluation of the new preparation on resistant strains isolated from another patient with Necrotizing Fasciitis were conducted, a 10% solution preparation showed antimicrobial effect equivalent to in vitro Imipenem (MIC<=0.25), Colistin (MIC<=0.5). The positive result in this severe mix flora infection with multiresistant strains indicates the value of the preparation. Further studies are needed to evaluate the full pharmacological activity.

Keywords: antibacterial activity, multiresistant bacteria.

Take Away Notes:

- The new preparation studied provides a solution to multiresistant mixed bacterial infection.
- The new preparation studied will be used in cases of bacterial infection that cannot be treated with antibiotics.
- Further studies are needed to evaluate the full pharmacological activity of dihydroanthracene disulfonic acid derivative.

Biography

PhD Florjana Rustemi PhD studied in the University of Tirana, Department of Pharmacy and graduated in 2009. She joined the University of Camerino, Italy for further studies in Hospital and Community Pharmacy and obtained a M.A in 2012. She received her PhD degree in 2021 from the University of Medicine, Tirana and is focused in education and research in pharmaceutical sciences. She has over ten years of experience with a history of working in the university, hospital & pharmaceutical industry. Skilled in pharmacology, individualized chemotherapy treatment, cost-effective medicine, forecasting, budgeting and procurement of medicines, clinical study of new medicines and GxP.

Tarek Alloush[1], Gulsel Yurtdas Kırımlıoglu[2]*

[1]Istanbul University, Istanbul, Turkey
[2]Anadolu University, Eskisehir, Turkey

In situ gels containing isoconazole nitrate/methyl-β-cyclodextrin inclusion complexes: Formulation and in vitro evaluation

Introduction and aims: Vaginal candidiasis is one of the most prevalent problems that women face throughout their lives. Considering the side effects and drug-drug interactions associated with the oral route, local administration of drugs is a first approach for the management of vaginal candidiasis. To obtain a desired therapeutic impact, vaginal drug delivery system must persist at infection sites for an extended period of time. *In situ* gel technologies improve availability by extending the time of the formulation remains in the vaginal canal. Antifungal agents within azole family like isoconazole nitrate (ISN) with lower aqueous solubility have been used as the drug of choice for vaginal fungal infections. The present work investigates the usage of methyl-Cyclodextrin (M-β-CD) as an ISN solubility improver that can be utilized to manufacture *in situ* gel systems for vaginal application in order to prolong the contact duration with the vaginal cavity and hence sustain medication uptake.

Methods: Solubility phase diagrams of ISN in the presence of M-β-CD were studied. According to this diagrams, molar ratios of inclusion complexes were determined and formulated by freeze drying (FD) and spray drying (SD) techniques. ISN/M-β-CD complexes were characterized by SEM, DSC, FT-IR, 1H-NMR and HPLC analyses. *In situ* gels were formulated with the selected inclusion complexes and thermosensitive polymers. Gels prepared by cold method were characterized for gelation temperature, gelling capacity, swelling test and rheological behaviour.

Results: AL-type dissolution phase diagrams were obtained. Complexes were prepared in a 1:1 molar ratio by SD and FD methods. With the prepared complexes, the ISN solubility was increased between 5 and 7.5 times. ISN/M-β-CD complexes formulated by FD method appeared in a typical morphology with a soft and fluffy structure while complexes formulated by SD method had a spherical shape with smooth surfaces. DSC, FT-IR and 1H-NMR analyses were confirmed the ISN inclusion into the M-β-CD cavity. Complexes prepared by SD method were selected for *in situ* gel formulation. After the required amount of polymer was found by testing, *in situ* gel systems were prepared by cold method using Pluronic® F127 and HPMC. In situ gel systems have been characterized in terms of rheological properties, etc. as stated above. The rapid gel formation of the formulations at 37°C and the long-term stability of the gel are indicative of its controlled release ability. In the evaluation of gelling capacity, it was determined that gelation occurred immediately and remained for a long time. The release values obtained as a result of the in vitro release study were evaluated in terms of kinetics and it was determined that it showed release behaviour in accordance with the Peppas-Sahlin model.

Conclusion: As a result, the solubility properties were increased by the formation of inclusion complexes and the duration of stay in the vagina and ISN release were extended by loading the complexes into *in situ* gels. Thus, it is thought that with less frequent and easier application (due to its sol-gel nature), patient compliance is increased and by improving the solubility properties of the active substance, vaginal drug delivery systems that can provide efficacy at low doses have been developed.

Take Away Notes:

- You will be able to have information about the relationship between solubility and drug.
- You will be able to comprehend the role of new generation cyclodextrins and inclusion complexes in increasing solubility.
- You will have an idea about the new generation vaginal drug delivery systems.
- You will have information about the advantages, preparation and characterization of *in situ* gelling systems as a drug delivery system.
- You will gain insight into the design and characterization of a drug delivery system.

Biography

Gulsel Yurtdas Kırımlıoglu got her Msc on "Inclusion complexes with antifungal agents" in 2010. She had completed her PhD study "Nanosized drug delivery system interfering epileptic mechanism" in 2014. She is Associate Professor in Department of Pharmaceutical Technology at Anadolu University. She is lecturer and researcher. She has several publications and presentations about novel technologies to enhance drug delivery. She also contributes to pharmaceutical journals as an active reviewer.

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POSTERS

DAY 03

5TH EDITION OF
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28-30 MAR

Sajad Shahbazi*, Tara Zakerali

Nencki Institute of experimental biology, Poland

A novel NF-Kappa B silencer: Benzo-dioxole-piperamide and its role as an anti-neuroinflammatory agent

Background: NF-kB contributes to the biosynthesis of various chemokines, cytokines, andenzymes. It plays many crucial roles in the upstream neuroinflammatory pathways. Thephosphorylation of Ser32 and 36 residues of IkB subunit leads to disruption of the bind between NF-kB complex protein and the inhibitory subunit (IkB). The mentioned process activates the NF-kB complex to shift into the nucleus and binds to the chromosomal DNA. One of the mostprominent targets to regulate the translocation of the NF-kB complex into the nucleus is the IKK-β enzyme. Inhibitors may bind directly to the active site of the IKK-β enzyme or suppress the geneexpression of the IKK-β enzyme and protect the integrity of the NF-kB complex and keep it in the inactive form inside cytosol.

Methodology: In the present study, we developed a novel NF-kB inhibitor encoded (D5) andinvestigated the efficacy of our druggable compound through various *in silico, in vitro*, and *insitu* tests. We have investigated the impact of D5 on the gene expression of the IKK-β enzyme using rt-PCR. The enzymatic function of IKK-β was indirectly monitored using a monoclonal anti-phospho-IkB-α (S32) to tract the radical phospho-IkB in the cytosol of microglial and astrocytic cells using western blot and immunocytochemistry techniques. The structuralinhibition of IKK-β by D5 and pharmacological properties of D5 were evaluated using *in silic*odrug discovery tools such as Schrodinger suite 2011 and Accelrys discovery studio ver. 2.5. The statistical analysis was performed using Microsoft Exel 2007.

Results: The results indicated that D5 inhibited the IKK-β enzyme in both genome andproteome. D5 demonstrated a significant reduction of the radical phospho-IkB-α in the cytosol ofhuman microglia and astrocytes.

Conclusion: The brilliant protective effect on the NF-kB complex, the great pharmacological properties for oral administration, and lack of toxicity, made D5 the most prominent inhibitor of the NF-kB pathway for further studies on developing a potent anti-inflammatory and anti-neuroinflammatory agent.

Keywords: NF-kB translocation, acetylation, phosphorylation, IKK-β, anti-neuroinflammatory agent

Biography

Dr. Sajad Shahbazi was awarded his Ph.D. in the field of Biotechnology from Panjab University, India (2018). He started his work as a Special GR and postdoctoral fellow at the Nencki Institute of Experimental Biology to investigate a novel technology and methodology to assay matrix metalloproteinase in the inflammatory process in the brain and its role in neuronal plasticity. During his scientific journey from his master's to his current scientific position, he has published various papers in several reputed journals. He has also been awarded several scientific rewards. The research interest of Dr. Sajad Shahbazi is to investigate drug-target interaction as well as a study of the genomics and proteomics leading to detect, design, and chemically or biologically synthesized druggable molecules for various neuronal disorders for further in vitro and in vivo studies. He is eager to investigate the immunomodulatory roles of phytochemicals and their semisynthetic or synthetic derivatives. Subsequently, validate their efficacies through various in vivo studies.

Ramandeep Kaur
ASBASJSM College of Pharmacy, India

A review: Novel method for microsponges drug delivery system

Microsponges drug delivery, because of their benefits has got a lot of potential and is very emerging field have been leading researchers around the globe to investigate them as drug carrier. Microsponges are polymeric drug delivery system composed of porous microspheres. They are tiny sponge like spherical particles with large porous surface. This unique technology for controlled release topical agents also use for oral as well as biopharmaceutical drug delivery. Microsponge are reliable delivery system that encapsulate both water insoluble and water sparing agent to improve their effectiveness. Microsponges can entrap various types of drugs and encorporated in formulations like cream, gel, lotion and powder. Various marketed formulations are also available Cerac, Ultraguard and retinol cream. One of the best feature of this technology is that that its own self- sterilizing and it provides increased efficacy for topically active agents with enhance formulation flexibility and numerous study has confirmed that microsponges are non-mutagenic, non-irritant and non-allergic in nature. The current review elaborates the microsponges technology with its release mechanism, preparation methods, characterization, evaluation parameters and its applications.

Biography

Ramandeep Kaur is a student in the pharmaceutics department of the ASBASJSM, College of Pharmacy, Bela (Punjab). She is pursuing a master's in pharmaceutics. She has done her bachelor's degree from Himachal Pradesh Technical University.

Saba Safdarpour[1], Zohre Eftekhari[2]*, Akram Eidi[1], Delaram Doroud[2]

[1]Science and Research Branch, Islamic Azad University, Tehran, Iran
[2]Pasteur Institute of Iran, Alborz, Iran

Evaluation of the encapsulated saponin by ferritin nanoparticles on pulmonary changes induced by Streptococcus pneumoniae in NMRI Mice

Streptococcus pneumoniae remains a primary cause of many diseases that leads to mortality worldwide. This study aimed to assess the effects of saponin encapsulated by ferritin nanoparticles on pulmonary changes induced by Streptococcus pneumoniae in NMRI mice. After fabrication and characterization of encapsulated saponin by ferritin nanoparticles through a scanning electron microscope and dynamic light scattering, the human alveolar basal epithelial cell cytotoxicity of saponin, nano ferritin, and encapsulated saponin by ferritin nanoparticles (10, 25, 50, 100, and 200 µg) concentrations was evaluated. NMRI mice were divided into control, pneumonia, pneumonia+ferritin nanoparticle, pneumonia with saponin, and pneumonia with nanoparticle-saponin treatment groups. Hematoxylin and eosin staining were used to determine the histology of the lungs, and ELISA was used to specify serum IL-4 levels. Real-time PCR and Western blotting were used to measure tumor necrosis factor-alpha (TNF-α) and protein cyclooxygenase-2 (COX2) gene expression, respectively. Pneumonia treated via the encapsulated saponin by ferritin nanoparticles group had a statistically significant decrease in pneumonia severity index and cyclooxygenase-2 protein expression compared to the pneumonia group ($p<0.001$). The tumor necrosis factor-alpha and serum levels of IL-4 expression were also significantly lower in the saponin-loaded ferritin group. The histopathology results revealed that the rates of inflammation, mucus secretion, pulmonary hemorrhage, thickening of the alveoli wall, and secretion of inflammatory cells in the saponin-nanoparticle group were lower than in other groups. It can be concluded that encapsulated saponin by ferritin nanoparticles, with their antibacterial, anti-inflammatory, and antioxidant potential, have protective effects against pneumonia. Oral administration may be incredibly assertive against progressively severe bacterial infections.

Take Away Notes:

- Induction animal modeling for pneumonia
- Using the Nano herbal medicine for preventive or treatment the pneumonia
- The consumption herbal saponin as a natural medicine has protective effect in pneumonia
- Oral administration may be incredibly assertive against progressively severe bacterial infections

Biography

Zohre is a DVM from Urmia University and a DVSc , Veterinary Internal Medicine, from the University of Tehran. She also conducted additional postdoctoral research course about Design and Development the Biological Products (Lung Surfactant) at the University of Tehran, before accepting my first position at the Pasteur Institute of Iran. She began as an Assistant Professor in 2015 and still active in this position today as head of the Biotherium department, where the in vivo assays of vaccines and biological drugs have been carried out. Additionally, She have collaborated with the Iranian Food and Drug Administration since 2020 as an advisor in preclinical studies of vaccines and biotechnological drugs.

Participants List

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