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INTERNATIONAL CONFERENCE ON 3D PRINTING AND ARTIFICIAL INTELLIGENCE IN PHARMACEUTICAL APPLICATIONS

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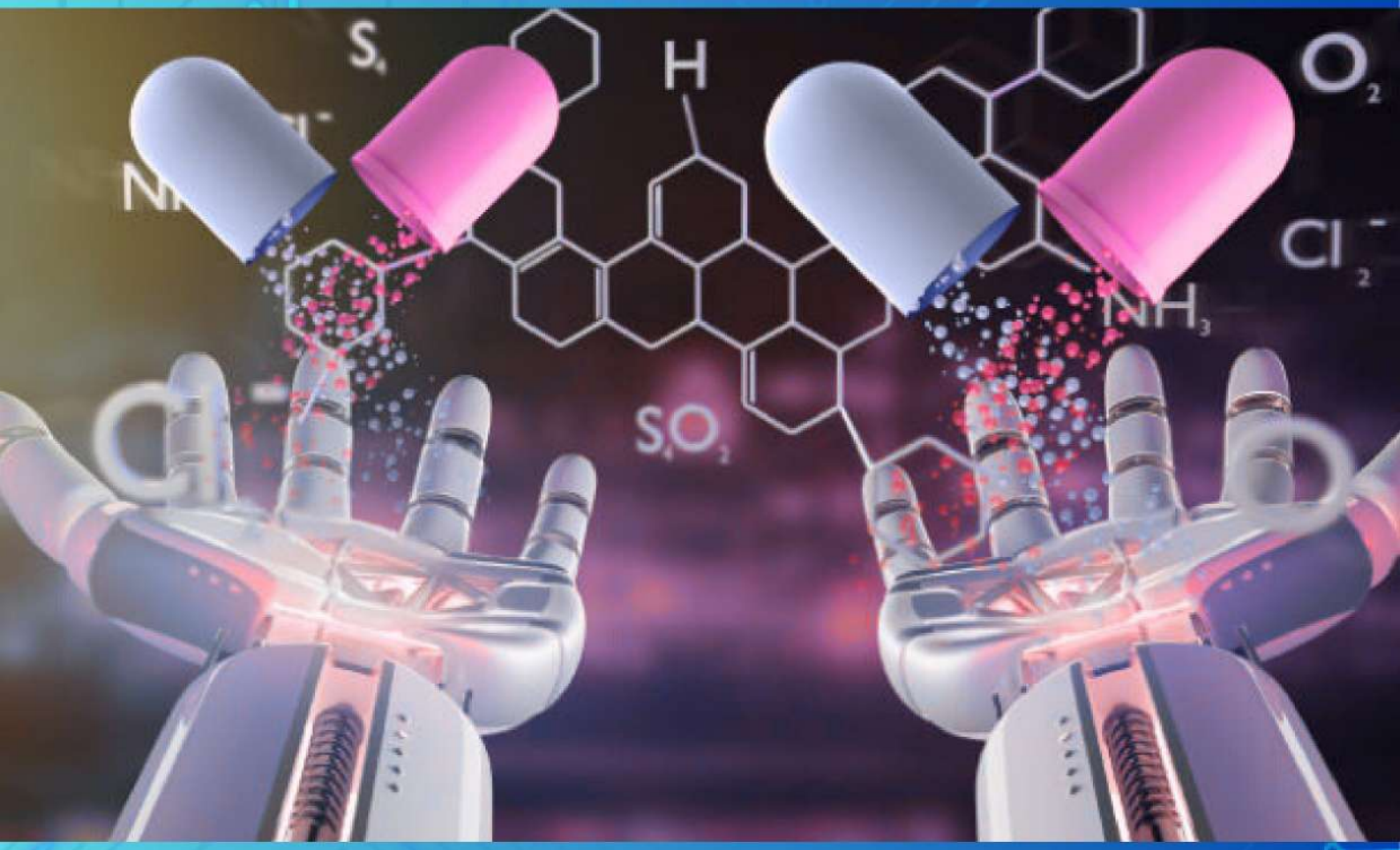

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International Seminar on 3D Printing and Artificial Intelligence in Pharmaceutical Applications

Organizers: PSG College of Pharmacy, Peelamedu, Coimbatore – 641004.
Date : 13//06/2025

Date	Time	Session	Speaker
13.06.2025	9:00 am- 9:30 am	Dr. M Ramanathan, M Pharm., Ph.D, D.Sc Inaugural- Key note address	
	9:30 am- 10:30 am	Speaker- 1	Dr Karthik Siram, M. Pharm., Ph.D, Senior Scientist, Center for Translational Medicine, Department of Biomedical and Pharmaceutical Sciences, Skaggs School of Pharmacy, University of Montana, Missoula, Montana- 59812 USA
	10:30 am- 10:45 am	Tea Break	
	10:45 am- 11:45 am	Speaker- 2	Dr. V. Ravichandran, M. Pharm., Ph. D., Professor and Head, Pharmaceutical Chemistry Unit, Faculty of Pharmacy, AIMST University, Semeling - 08100, Malaysia.
	11:45 am - 1:00 pm	Scientific Poster Presentation Session-01	
	1:00 pm- 2:00 pm	Lunch Break	
	2:00 pm- 3:30 pm	Speaker- 3	Dr. Durgaramani Sivadasan, M.Pharm., Ph.D., Professor, Department of Pharmaceutics, Faculty of Pharmacy, Jazan University, Jazan, Kingdom of Saudi Arabia
	3:30 pm- 4:45 pm	Scientific Poster Presentation Session-02	
	4:45 pm- 5.00 pm	Tea Break	
	5:00 pm- 5.30 pm	Valedictory Function	

SPEAKER PROFILE

Dr. Karthik Siram, M. Pharm., Ph.D.,

Senior Scientist, Center for Translational Medicine,
Department of Biomedical and Pharmaceutical Sciences,
Skaggs School of Pharmacy,University of Montana,
Missoula,Montana- 59812 USA

Dr. Karthik Siram, M. Pharm., Ph.D., is a dynamic researcher specializing in advanced drug delivery systems and vaccine formulation. He is an alumnus of Sri Ramakrishna Institute of Paramedical Sciences (B.Pharm) and PSG College of Pharmacy (M.Pharm – Gold Medalist), and holds a Ph.D. in Pharmaceutics from The Tamil Nadu Dr. M.G.R Medical University. He has authored over 35 international publications and is involved in cutting-edge research on mRNA vaccines, lipid nanoparticles, and adjuvanted emulsions for diseases like COVID-19 and tuberculosis. Dr. Karthik has received multiple research grants and fellowships, including funding from SERB and Tamil Nadu State Council for Science and Technology. His translational work bridges academia and global health innovation.

ABSTRACT

The Science Behind Vaccine Design and Formulations

Vaccines are biological preparations that offer protection against infections. They have transformed public health by harnessing the immune system to prevent infectious diseases, cancers, and substance use disorders. This talk introduces the foundational principles of vaccines, focusing on the roles of antigens and adjuvants in eliciting protective immunity. Antigens are the molecular signatures recognized by the immune system, while adjuvants enhance the immune response and shape its quality and duration. The evolution of adjuvant technology has been accelerated by nanoparticle-based delivery systems, which enable precise control over antigen-adjuvant co-delivery, co-localization, release kinetics, and tissue targeting. Popular nanoparticulate platforms such as aqueous formulations, liposomes, ionizable lipid

nanoparticles, emulsions, aluminum salts, and silica nanoparticles, along with their design considerations in formulating the antigens and adjuvants, will be discussed.

The second half of the talk highlights the growing role of artificial intelligence (AI) in pharmaceutical research, particularly in optimizing vaccine design, predicting immunogenicity, and guiding formulation strategies. A case study on the translation of an anti-opioid vaccine from preclinical discovery to early-stage development will be showcased to journey from the bench to the clinic. This vaccine integrates a synthetic hapten antigen with a TLR- 7/8 agonist-loaded nanoparticle adjuvant and demonstrates how rational design and robust formulation science can advance vaccines against non-infectious targets. Through this integrated overview, attendees will gain a foundational understanding of modern vaccine formulation and development, emphasizing how multidisciplinary approaches, including nanotechnology and AI are shaping the future of vaccinology and translational pharmaceutics.

SPEAKER PROFILE

Dr. V. Ravichandran, M. Pharm., Ph.D.,

Professor and Head

Pharmaceutical Chemistry Unit,Faculty of Pharmacy,

AIMST University,

Semeling - 08100, Malaysia

Dr. V. Ravichandran, M. Pharm., Ph.D., is a highly accomplished pharmaceutical chemist with over 24 years of academic and research experience. He is an alumnus of The Tamil Nadu Dr. M.G.R Medical University (B.Pharm) and Dr. H.S. Gour Vishwavidyalaya (M.Pharm& Ph.D.), supported by UGC and AICTE fellowships. His research interests span medicinal chemistry, molecular modeling, nanotechnology, and green synthesis. He has published 178 research articles, authored 7 book chapters, and held 2 international patents. A recipient of multiple national and international research grants, he has been ranked among the Top 2% scientists in the world by Stanford University. Dr. Ravichandran has mentored Ph.D., postgraduate, and undergraduate students, and serves as reviewer and editorial board member for numerous international journals.

ABSTRACT

Beyond the Bench: AI Role in Drug Discovery

The traditional drug discovery pipeline is notoriously long, expensive, and fraught with high failure rates, often taking over a decade and billions of dollars to bring a single drug to market. This talk explores the transformative impact of artificial intelligence (AI) and machine learning (ML) on accelerating various stages of drug discovery, moving "beyond the bench" into a new era of computational pharmacology.AI algorithms are revolutionising target identification by analysing vast biological datasets to pinpoint disease-relevant pathways and proteins. In lead optimisation, AI excels at predicting drug-like properties, pharmacokinetics, and toxicity, significantly reducing experimental iterations. Virtual screening, powered by deep learning, enables the rapid identification of promising compounds from massive chemical libraries. Furthermore, generative AI models are now capable of designing novel molecular structures with desired characteristics, opening avenues for previously unattainable drug candidates. AI also plays a crucial role in predicting synthesis routes and optimising clinical trial design and patient stratification, ultimately enhancing success rates. The integration of AI promises not only to drastically cut down the time and cost associated with drug development but also to uncover innovative therapies for complex diseases, marking a paradigm shift in pharmaceutical research and development.The main aim of this talk is to highlight the immense role and challenges of AI technology in drug discovery.

SPEAKER PROFILE

Dr. Durgaramani Sivadasan,M. Pharm., Ph.D.,

Professor

Department of Pharmaceutics Faculty of Pharmacy

Jazan University,

Jazan, Kingdom of Saudi Arabia

Dr. Durgaramani Sivadasan, M. Pharm., Ph.D., is a senior academician and expert in nanodrug delivery systems, with over 25 years of teaching and research experience. She holds B.Pharm and M.Pharm degrees from Periyar College of Pharmaceutical Sciences and completed her Ph.D. at Bharathidasan University, TamilNadu. Her research areas include liposomes, stealth nanoparticles, polymeric micelles, and solid lipid nanoparticles, with a strong emphasis on cancer nano therapy. She has authored numerous peer-reviewed publications in high-impact journals and has received research grants from the Tamil Nadu State Council for Science and Technology and Jazan University. She has also mentored several UG and PG projects and actively contributes to international conferences and seminars.

ABSTRACT

Harnessing 3-Dimensional Printing (3DP) for Customizable Solid Oral Dosage Forms (SODFs) - A New Era in Personalized Medicine

The advent of 3-dimensional printing (3DP) technology has revolutionized the pharmaceutical landscape, particularly in the development of solid oral dosage forms (SODFs). Traditional mass-manufacturing methods often fail to account for the interindividual variability in patient needs, thereby limiting the potential for personalized treatment. 3DP overcomes this limitation by enabling the precise fabrication of tailored dosage forms with customizable drug release profiles, shapes, sizes, and drug combinations. This technology facilitates on-demand production and patient-centric therapies, enhancing treatment efficacy and patient compliance. Various 3DP techniques such as fused deposition modelling (FDM), inkjet printing, and stereolithography

have shown promise in fabricating complex and multifunctional oral dosage forms. Fused Deposition Modelling (FDM), a widely used 3D printing method, offers promising potential in the production of solid oral dosage forms with precise control over drug release profiles, dosage customization, and complex geometries. Pharmaceutical-grade thermoplastic polymers such as polyvinyl alcohol (PVA) and polylactic acid (PLA) were combined with active pharmaceutical ingredients (APIs) to create drug-loaded filaments via hot-melt extrusion. FDM 3D printing is a viable platform for the on-demand production of personalized oral medications, offering new avenues for patient-centric therapies and decentralized manufacturing in clinical settings. As regulatory frameworks evolve and material science advances, the integration of 3DP into routine pharmaceutical practice marks a pivotal step toward the realization of personalized medicine.

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Abstract Number: A001

DEVELOPMENT OF AN INNOVATIVE BIODEGRADABLE CARBON-BASED SOLID SUBSTRATE EMBEDDED WITH SILVER NANOPARTICLES FOR DETECTION OF BIOMARKER USING SURFACE-ENHANCED RAMAN SPECTROSCOPY

Mythili S R [1], V Sankar [1], Ashma S [1], BijiPullithadathil[2], Rajesh UP [2], Navamisunil [2]

1.Department of Pharmaceutics, PSG College of Pharmacy, Coimbatore, Tamil Nadu, Affiliated to TN Dr. M.G.R Medical University, Guindy, Chennai, Tamil Nadu.
2. Nanosensors and Clean Energy Laboratory, Department of Nanoscience and Technology, PSG Institute of Advanced Studies, Coimbatore, Tamil Nadu.
Email ID: mythilipavithra33@gmail.com

The development of sensitive, sustainable diagnostic platforms is essential for the early detection and monitoring of diseases, particularly cancer and neurodegenerative disorders. In this study, we report the fabrication of a novel biodegradable carbon-based solid substrate embedded with silver nanoparticles (AgNPs) for biomarker detection using Surface-Enhanced Raman Spectroscopy (SERS). The substrate exploits the high surface area, biocompatibility, and degradability of carbon materials, coupled with the excellent plasmonic properties of AgNPs, to achieve significant Raman signal enhancement and molecular sensitivity. We successfully demonstrated the detection of amyloid-beta (Aβ) peptides, a critical biomarker for Alzheimer's disease, confirming the substrate's capability for sensitive and selective identification of neurodegenerative markers(coconut fibre substrate). The enhanced SERS signals allowed for detection at low concentrations with high stability and reproducibility, establishing a strong foundation for future clinical applications. Expanding the scope of our work, we are currently optimizing the platform for the detection of sarcosine(using rice straw substrate), a potential biomarker for prostate cancer, in biological fluids. This adaptation aims to support non-invasive, early-stage cancer diagnostics. Comprehensive characterization of the solid substrate was performed using particle size analysis, X-ray Diffraction (XRD) Spectroscopy, and Raman spectroscopy to confirm the successful integration of AgNPs and to assess the structural, chemical, and optical properties of the substrate. This research underscores the promise of biodegradable carbon-AgNP SERS substrates as eco-friendly, high-performance diagnostic tools with broad applications in biomedical sensing.

Keywords: Biomarker, Silver nanoparticles, Surface Enhanced Raman Spectroscopy, Solid substrate.

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Abstract Number: A002

Development of a Biopolymer-Gold Nanocomposite Nasal Spray for Antibacterial Activity

Thogaikarasi R[1], Sankar V[1], Sathish P.B[2] , Selvakumar R[2]

[1] Department of Pharmaceutics, PSG College of Pharmacy
[2] Department of Nanotechnology, Institute of Advanced Science, Peelamedu, Coimbatore-641004.
Email ID: thogaikarasi@gmail.com

Background: The nasal cavity, being a primary entry point for pathogens, is a promising route for localized antimicrobial therapy. **Aim and objective:** To develop a biopolymer-based nasal spray containing gold nanoparticles (AuNPs) synthesized via green chemistry and evaluate its antibacterial activity and physicochemical properties. **Methodology:** In Phase I, biopolymers pectin and carboxymethyl cellulose (CMC) were screened based on solubility, pH, viscosity, and mucoadhesive properties. In Phase II, gold nanoparticles were synthesized using the Turkevich method, with biopolymers acting as both reducing and stabilizing agents. A D-optimal design was employed to optimize the formulation parameters for gold nanoparticles using pectin, aiming to achieve desired particle size, stability, and dispersity. In Phase III, the formulations were characterized for pH, viscosity, FTIR, particle size, PDI, and zeta potential, UV spectrometry, AFM. In Phase IV, antibacterial activity was assessed against *Staphylococcus aureus* and *E.coli* using well diffusion. **Results:** The CMC-AuNP formulation exhibited a particle size of 379.9 nm, PDI of 1.000, and a zeta potential of –38.3 mV, while the pectin-AuNP formulation, F6 showed a particle size of 420 nm, PDI of 0.459, and zeta potential of –21.9 mV, indicating good stability. Antibacterial activity was showed for both CMC-AuNPs, Pectin AuNP at mild concentration also. **Conclusion:** The formulated gold nanoparticle nasal sprays using CMC and pectin demonstrated stability and preliminary antibacterial efficacy, indicating their potential as a localized treatment against nasal bacterial infections. Future work will focus on cytocompatibility, stability.

Keywords: Gold nanoparticles, nasal spray, biopolymer, antibacterial activity, CMC, pectin.

Abstract Number: A003

Innovative Gold Nanoparticle-Based Hydrogel Formulation of Luliconazole for Antifungal Therapy

Joshva John Britto*, Veintramuthu Sankar, Selvakumar R, Sathish P.B

Department of Pharmaceutics, PSG College of Pharmacy, Peelamedu, Coimbatore-641004.
Department of nanobiotechnology, PSG Institute of Advance Studies, Peelamedu, Coimbatore-641004
Email ID: joshvajo666@gmail.com

Background: Superficial fungal infections are increasingly prevalent, especially in tropical climates. Conventional antifungal therapies face challenges such as poor drug solubility, limited skin penetration, and reduced efficacy. **Aim and Objective:** To formulate a luliconazole-loaded hydrogel with GNPs and evaluate its antifungal activity against candida albicans. **Methodology:** Phase I involved preformulation studies. Phase II, Luliconazole hydrogel containing GNPs were synthesized using the modified-Turkevich method and eight formulations were developed using a 2^3 factorial design. Phase III, Particle size, PDI, zeta potential, drug content, entrapment efficiency and In-vitro drug release were evaluated. Phase IV, AFM, antifungal activity was studied for optimized formulation. **Results:** Preliminary characterization of hydrogel (F8) showed a particle size of 361.4 nm, PDI of 0.346 and zeta potential of –34.8 mV, indicating good stability. Drug content was found to be 95.8% and entrapment efficiency was 97.71%. In-vitro drug release studies were confirmed sustained release over time. The antifungal activity was evaluated by comparing the zones of inhibition of the Luliconazole 1% hydrogel, marketed formulation, GNP-CMC hydrogel, and the pure drug**. Conclusion:** This novel GNP-luliconazole hydrogel formulation shows promising potential for enhancing antifungal efficacy against candida albicans.

Keywords: Luliconazole, GNPs, hydrogel, dermatophyte, factorial design.

Abstract Number: A004

SYNERGISTIC PHYTOCHEMICAL LIPOSOMES: A TRIPLE-ACTION STRATEGY AGAINST LUNG CANCER, MICROBES, AND OXIDATIVE STRESS

Vasanth S*, Habibur Rahman S M

Department of Pharmaceutics, PSG College of Pharmacy, Coimbatore, India
Email ID: vasanthnkl500@gmail.com

Background: Hesperidin *(Citrus sinensis*) and Piperine (*Piper nigrum)* are phytoconstituents with proven antioxidant, antimicrobial, and anticancer activities, but their clinical potential is limited by poor solubility and bioavailability. **Aim & Objective:** To develop and optimize a liposomal formulation co-loaded with Hesperidin and Piperine using the thin film hydration technique and evaluate its physicochemical and biological properties. **Methods:** Liposomes were prepared using soya lecithin and cholesterol and then optimized via Central Composite Design and optimised formulation shown particle size (227.5 nm), PDI (0.227), and zeta potential (–30.4 mV). Confirmatory phytochemical tests for alkaloids and flavanoids, FTIR, XRD, SEM, AFM, and phase-contrast microscopy were conducted. *In vitro* drug release, degradation (acid, base, oxidative), antimicrobial, antioxidant, and anticancer activities were assessed. **Results:** The optimized liposomes were spherical, smooth, and showed Homogeneity by using SEM, Phase contrast microscopy. FTIR confirmed drug–excipient compatibility; XRD revealed amorphous conversion. Drug release was significantly higher in liposomes (Hesperidin 84%, Piperine 80.6%) compared to pure drugs. Antimicrobial activity

showed effective inhibition against *S. aureus* (24 mm), *E. coli* (26 mm), and *C. albicans* (21 mm). Antioxidant activity of the Liposome (96.8%) was comparable to ascorbic acid (99%). The liposomes exhibited superior cytotoxicity against A549 lung cancer cells (IC_{50} = 35.42 µg/mL), compared to individual drugs and their combination. **Conclusion:** Hesperidin and Piperine co-loaded liposomes demonstrated improved solubility, stability, and enhanced antimicrobial, antioxidant, and anticancer efficacy, supporting their potential in advanced therapeutic delivery systems.

Keywords: Hesperidin, Piperine, Liposomes, Central Composite Design, Anticancer, Anti-microbial

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Abstract Number: A005

A PROMISING SOLID LIPID NANOPARTICLE AND PHARMACOKINETICS EVALUATION IN RATS TO IMPROVE THE ORAL BIOAVAILABILITY OF TETRAHYDROCURCUMIN

Ragavi Arunagiri[1], Karthik Siram[2], Arjunan Karuppaiah[1], Habibur Rahman[1]

[1]Department of Pharmaceutics, PSG College of Pharmacy, Peelamedu, Coimbatore- 641004
[2]Department of Biomedical and Pharmaceutical Sciences, Center for Translational Medicine, Skaggs School of Pharmacy, University of Montana, United States
Email ID: ragavinkl18@gmail.com

Background: Although tetrahydrocurcumin (THC) possess several pharmacological properties, its clinical application is hindered by its poor oral bioavailability. **Aim &objective:** To test whether the delivery as solid lipid nanoparticles (SLNs) could improve the oral bioavailability of THC, the present study was conducted. **Methods:** Several batches of THC loaded SLNs (TS) were prepared using two different lipid carriers (Sterotex HM and stearic acid), five stabilizers (polyvinyl pyrrolidine, propylene glycol, poloxamer 188, PEG 400 and PEG 6000) and a surfactant (tween 80). TS formulations were characterized for size, zeta potential, morphology, entrapment efficiency, physical state of the drug, and in vitro drug release profile of SLNs. Pharmacokinetic studies were conducted in male Wistar rats using selected TS formulations. **Results:** The particle size of the SLNs was within the range of 25.4 ± 3.2 and 148.2 ± 2.8 nm across various TS formulations. The TEM and AFM images revealed that the particles were spherical in shape with nm size range and possessed a smooth topography. **Conclusion:** Pharmacokinetic studies have revealed that the delivery of THC as SLNs enhanced the amount of drug reaching the systemic circulation of Wistar rats. Delivery as SLNs enhanced the oral bioavailability of THC.

Keywords: Tetrahydrocurcumin, bioavailability, solid lipid nanoparticles, Wistar rats, pharmacokinetics.

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Abstract Number: A006

MICROENCAPSULATION OF CYPRESS OIL IN TREATMENT OF ACNE FOR ITS ENHANCED ACTIVITY

Sanjay Raja. D. K *, Vijayalakshmi. S

Department of Pharmaceutics, PSG College of Pharmacy, Coimbatore.
Email.ID:dksanjayraja@gmail.com

Background: Cypress oil is a volatile essential oil with strong antibacterial, antimicrobial, antifungal, and anti-inflammatory properties due to constituents like α-pinene, and cedrol. However, its high volatility and environmental instability limit its use. Microencapsulation via complex coacervation is used to overcome the challenges. **Aim and Objective:** The goal is to enhance the encapsulation efficiency of CO using the coacervation technique with an appropriate polymeric carrier, thereby preserving and ensuring its physicochemical properties. **Methodology:** CO was screened for its physicochemical constituents and quantified using GC-MS, while high-retention compounds were further analysed by UV spectroscopy using linalool as a standard. The oil was encapsulated via complex coacervation using chitosan and xanthan gum at varying ratios of 1:1, 2:1, 3:1, and 4:1. **Results:** Physicochemical screening confirmed the presence of terpenoids in CO, while further quantification using GC-MS revealed a higher concentration of α-pinene. UV spectroscopy analysis, conducted using linalool as a standard, indicated a terpenoid concentration of 27.78 µg/ml. Microscopic analysis confirmed the structural integrity of the emulsion with observed particle sizes of 17.34 µm, 27.51 µm, 14.94 µm, and 25.74 µm. **Conclusion:** CO was successfully encapsulated using the coacervation technique. Further, stability and antimicrobial studies will be carried out to substantiate efficiency of microencapsulated oil.

Keywords: Microencapsulation, Cypress Oil (CO), Coacervation.

Abstract Number: A007

Development and Characterization of Tramadol Hydrochloride Transdermal Patches with Various Permeation Enhancers

S. Jayakrishna, S.P.Hari Prakash, V. Sankar*

Department of Pharmaceutics, PSG College of Pharmacy.
Email: jkdpm717@gmail.com

Aim: The present study aims to prepare and evaluate Tramadol Hydrochloride reservoir-controlled transdermal patches using various permeation enhancers. **Objective:** To formulate reservoir-type transdermal patches of Tramadol Hydrochloride with different permeation

enhancers and evaluate their physicochemical characteristics and in vitro drug release behavior. **Methodology:** Transdermal patches were prepared using the solvent casting technique. Four different permeation enhancers—oleic acid, dimethyl sulfoxide (DMSO), Tween 80, and Tween 60—were incorporated. A 5% polyvinyl alcohol solution was used as the backing membrane. The drug reservoir layer comprised Tramadol Hydrochloride, hydroxypropyl methylcellulose (HPMC K100), propylene glycol (3%), and one of the permeation enhancers. A rate-controlling membrane of Eudragit RS 100 was cast over the reservoir to regulate drug release. The patches were evaluated for various physicochemical parameters such as weight variation, thickness, moisture uptake, water vapour transmission, erosion, tensile strength, drug content uniformity, and in- vitro drug release. **Results:** All formulations were evaluated as per Indian Pharmacopoeia guidelines. Among the formulations, DMSO-based patches (F2) showed the highest drug release and exhibited superior physical characteristics compared to others. **Conclusion:** DMSO was found to be the most effective permeation enhancer among those tested, providing enhanced drug release from the transdermal system and proving suitable for reservoir-controlled patch development.

Keywords: Tramadol Hydrochloride, Transdermal Drug Delivery, Reservoir-Controlled, Permeation Enhancer, Solvent Casting Technique

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Abstract Number: A008

Development and Evaluation of Floating Tramadol HCl Tablets: A Hydrodynamically Balanced Drug Delivery Approach

A. Ronnikka Shiny, P. S. Kirubhakaran, V. Sankar

Department of Pharmaceutics, PSG College of Pharmacy
Email id: ronnikkashiny@gmail.com

Background: The background of this study is to prepare and evaluate Tramadol HCl tablets using a hydrodynamically balanced drug delivery approach. **Aim and Objective:** The primary aim of this study is to formulate Tramadol hydrochloride tablets employing various polymers to develop a hydrodynamically balanced drug delivery system. To evaluate the pre-compression and post-compression parameters for the granules and tablets to optimise a suitable formulation. **Methodology:** Tramadol hydrochloride tablets were formulated using the direct compression technique. Polymers like hydroxypropyl methylcellulose (HPMC K100), xanthan gum, and their combination were employed. The required quantity of Tramadol HCl was accurately weighed and blended with the polymers, effervescent agents, and lactose using a mortar and pestle for a few minutes to ensure uniform mixing. Subsequently, pre-weighed magnesium stearate and talc were incorporated into the blend and mixed for three minutes. The final mixture was passed through a sieve no:40 to achieve uniform particle size distribution. The sieved blend was then compressed into tablets using a tablet punching machine. **Result:** Preformulation studies for the granules were performed to

analyse the flow properties for tablet compression. The formulated tablets met the IP specifications for thickness, diameter, weight variation, hardness and friability. In vitro dissolution studies were conducted on three different formulations to evaluate the drug release profiles. Among these, a suitable formulation for a hydrodynamically balanced drug delivery system was identified. **Conclusion:** The study found that granules containing Xanthan gum had passable flow properties, while HPMC K100 or its combinations had poor flow characteristics. The Xanthan gum formulation achieved 81% drug release at the end of 180 minutes, while HPMC K100 and a combination resulted in rapid drug release. This suggests that Xanthan gum-based formulation is promising for sustained delivery of Tramadol HCl.

Keywords: Tramadol Hydrochloride (Tramadol HCl), Hydrodynamically Balanced Drug Delivery System (HBS), Direct Compression Technique, Hydroxypropyl Methylcellulose (HPMC K100)

Abstract Number: A009

AMLODIPINE USING COMBINATION POLYMERS

R.Ronnie Jacques, P. S. Kirubhakaran, V. Sankar

Department of Pharmaceutics, PSG College of Pharmacy
Email id: ronniejacques2@gmail.com

Background: The background of the present study was aimed to formulate and characterize mucoadhesive buccal tablets of amlodipine to provide controlled drug release and enhanced mucoadhesion at the site of application. **Aim and Objective:** The objectives included preparing four different formulations (F1–F4) using varying proportions of hydrophilic polymers hydroxypropyl methylcellulose (HPMC), sodium carboxymethylcellulose (SCMC), their combinations and evaluating the physicochemical, mucoadhesive and drug release properties to identify the best formulation for controlled buccal delivery. **Methodology:** Four formulations were prepared by direct compression- F1 (HPMC 60 mg), F2 (SCMC 60 mg), F3 (HPMC 30 mg + SCMC 30 mg) and F4 (HPMC 22.5 mg + SCMC 22.5 mg). The prepared tablets were evaluated for hardness, thickness, weight variation, friability, swelling index, surface pH, mucoadhesion time and drug release have been analysed as per Indian Pharmacopeia. **Results:** All formulations complied with Indian Pharmacopeia limits, showing acceptable hardness, low friability, uniform weight and thickness and drug content. The swelling index and surface pH were within buccal tolerance. Among the formulations, F3 (HPMC 30 mg + SCMC 30 mg) showed superior mucoadhesive strength, prolonged retention at the application site and controlled drug release indicating its suitability for sustained buccal delivery. **Conclusion:** The study concluded that combination polymers, particularly in F3 formulation, significantly enhance mucoadhesion and control the release of

amlodipine. Mucoadhesive buccal tablets of amlodipine thus offer a promising approach for controlled delivery.

Keywords: Amlodipine, Mucoadhesive buccal tablets, HPMC (Hydroxypropyl methylcellulose), SCMC (Sodium carboxymethylcellulose), Direct compression

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Abstract Number: A010

Formulation and evaluation of antibacterial and antifungal activity of crude coconut shell oil

Venkatesh.A. N*, Arulkumar. R

The Erode College of Pharmacy, Veppam palayam, Tamil Nadu, India.
E-mail: anvenkatesh18@gmail.com

Background: Skin is the largest organ in the body and it is considered as an external defense system. It covers the outside of the body and has other functions beside the defense mechanism. The aim of the present study was to formulate and evaluate the antibacterial and antifungal activities of crude coconut shell oil. In the present investigation the formulation were developed without having any problems of skin irritancy, allergy or sensitivity. The study reveals that coconut shell oil can be used as antibacterial and antifungal agents and also it could be obtained at a economical price, replacing the commonly used antibiotics which usually gives side effects to the mankind. Thus, coconut shell oil can be regarded as a promising candidate with high therapeutic potential for ointment preparation.

Keywords: Antibacterial, Antifungal, crude coconut shell oil.

Abstract Number: A011

REVOLUTIONIZING PHARMACY FIELD WITH AI

Nimna Meera Yousuf, Junise V

Al Shifa College of Pharmacy, Kerala
Email ID: nimnameerayousuf@gmail.com

Background: Artificial Intelligence (AI) is reshaping the pharmaceutical industry. It accelerates drug discovery and development timelines. Enhances precision, operational efficiency, and cost-effectiveness. Plays a critical role in enabling personalized patient care. **Aim and Objective:** Explore AI's role in accelerating drug discovery. Assess how AI optimizes clinical trial design and execution. Examine the use of predictive modelling in

pharmaceutical research. Analyse AI-driven approaches to personalized medicine. Highlight the impact of AI on formulation optimization. **Methods:** Comprehensive literature review of AI applications in pharmaceuticals. Case study analysis of AI platforms such as: AlphaFold (protein structure prediction), IBM Watson Health (data analytics in healthcare), Benevolent AI (drug discovery), Tempus (precision medicine). Inclusion of real-world examples and peer-reviewed research. Focused evaluation on AI's role in decision-making and data-driven development**. Results:** AI-based virtual screening accelerates identification of drug candidates. Machine learning improves clinical trial design and patient selection. Predictive modelling lowers drug toxicity and failure rates. Genomic analysis enables targeted, personalized treatment strategies. AI enhances formulation design using molecular and biophysical data. Conclusion: AI significantly enhances efficiency and innovation in pharma. Enables faster, safer, and more tailored therapeutic solutions. Future advancements in AI will continue to transform drug development and patient outcomes.

Keywords: Artificial Intelligence, Drug Discovery, Clinical Trials, Predictive Modelling, Personalized Medicine, Pharmaceutical Innovation

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Abstract Number: A012

COMPUTATIONAL SCREENING OF PLANT-DERIVEDCOMPOUNDS TARGETING LANOSTEROL 14-ADEMETHYLASE FOR ANTIFUNGAL ACTIVITY

Nishanthi. G1*, G. Ramakrishnan

1. * Department Of Pharmaceutics, School Of Pharmacy, Sri Balaji Vidyapeeth (Deemed To Be University), Pillayarkuppam, Puducherry 607402.
2. Mgm Advance Research Institute, Sri Balaji Vidyapeeth (Deemed To Be University), Puducherry 607402.

Email ID: Nisha97pharmacist@gmail.com

Background: Fungal infections, affecting around 40 million people in developing and underdeveloped countries, remain a major public health concern. They range from superficial infections of the skin, hair, and nails to life-threatening deep mycoses affecting organs and the central nervous system. Common invasive pathogens include *Candida albicans, Cryptococcus neoformans,* and *Aspergillus fumigatus.* Current antifungal treatments—such as azoles, polyenes, and echinomycins—face challenges like resistance, toxicity, and high cost. Despite research progress, the availability of effective and safe antifungal drugs remains limited. Growing concerns over current antifungal drug limitations highlight the need for safer, affordable, plant-based alternatives. Medicinal plants offer diverse bioactive compounds with promising antifungal properties. **Aim & Objective:** This study aims to evaluate the antifungal potential of bioactive compounds identified from a medicinal plant extract by targeting lanosterol 14-α demethylase (CYP51) through molecular docking and

ADMET profiling. The objectives include assessing the binding affinities of GC-MS–identified plant compounds with the fungal CYP51 enzyme, evaluating their drug-likeness and pharmacokinetics using Swiss ADME, and predicting their toxicity profiles via PKCSM. Clotrimazole was used as the reference standard for comparative analysis. **Methodology:** The plant was extracted using ethanol, and its phytochemicals were identified by GC-MS analysis. These compounds were docked with the fungal enzyme lanosterol 14-α demethylase (CYP51) using AutoDock4.2.1, with Clotrimazole as the reference standard. Molecular docking assessed the binding affinities and interactions of the plant compounds with CYP51. ADMET profiling was performed using Swiss ADME to evaluate drug-likeness, oral bioavailability, GI absorption, BBB permeability, and solubility. PKCSM predicted toxicity risks including hepatotoxicity and skin sensitisation. **Result:** Several GC-MS–identified phyto compounds demonstrated strong binding affinities with fungal CYP51,notably 15-hydroxy pentadecanoic acid and 2-tridecenal (E)-, indicating excellent potential as enzyme inhibitors. Several ligands showed interaction profiles comparable to clotrimazole, highlighting their promising antifungal efficacy. Most compounds met Lipinski's Rule of Five, confirming favorable drug-likeness properties. High gastrointestinal absorption and good water solubility suggest these compounds have strong potential for oral bioavailability. Toxicity predictions revealed low hepatotoxicity and overall safe profiles, with minimal adverse effects, supporting their suitability as antifungal candidates. **Conclusion:** The ethanolic extract of the selected plant contains promising antifungal compounds with potentialCYP51 inhibitory activity. In silico results support further in vitro and in vivo validation. This studyprovides valuable leads for developing plant-based antifungal agents.

Keywords: Antifungal, CYP51 inhibitors, Drug-likeness, ADMET prediction, PKCSM toxicity

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Abstract Number: A013

AI–DRIVEN DRUG REPURPOSING: A CASE-BASED REVIEW WITH INSIGHTS FROM TRADITIONALAPPROACHES.

Mohanambigai R N, Vasanth U M, Mohana priya T S, G. Sathyaprabha, D SaranyaShanmugapriya.

Department of pharmacy practice, RVS College of Pharmaceutical Sciences, Sulur, Coimbatore -641402.
Email ID: vasanthum8@gmail.com.

Background: Traditional drug discovery is time-consuming and costly. Artificial Intelligence (AI) offers a transformative approach for drug repurposing—uncovering new indications for existing drugs using computational power and real-world data. **Aims &Objectives :**To explore the role of AI-driven technologies in accelerating drug repurposing and highlight its success through case studies across various disease domains. **Methods :**A literature-based review of AI-integrated methodologies including machine learning (ML),deep learning (DL),

natural language processing (NLP), and knowledge graphs. Six real-worldcase studies were selected based on recent publications and clinical trial data, showcasing AI-assisted repurposing efforts. **Results :** Case studies included successful AI-predicted repurposing such as: Baricitinib for COVID-19 (validated through AI predictions), Ketamine for Cocaine Use Disorder , Efavirenz for Parkinson's Disease , Raloxifene for COVID-19 , Drug candidates for Cataract prevention in diabetic patients, DREAM-RD AI Platform for Fragile X Syndrome AI applications revealed a substantial reduction in research timelines, enhanced success in identifying candidate drugs, and reduced manpower in clinical trials, supporting future scalability in rare disease research. **Conclusion:** AI enables faster, data-driven repurposing of existing drugs, surpassing limitations of traditional methods. With advancements in AI technologies, future drug discovery will become more predictive, patient-centric, and efficient.

Keywords: Drug repurposing, Artificial Intelligence, Machine Learning, Case studies, Clinical Research, Translational Medicine.

Abstract Number: A014

Development and Evaluation of a Polyherbal Churna

Shahana U, Shebina P Rasheed

Alshifa college of pharmacy, Poonthavanam (po), Kizhattur, Perinthalmanna, Malappuram
Email ID: shahanasidheeq@gmail.com

Background: The rising prevalence of hyperlipidemia necessitates the development of effective therapeutic options. This study focuses on formulating a new anti-hyperlipidemic churna using *Cynodondactylon, Emilia sonchifolia, Moringa oleifera*, and *Trigonella foenum-graecum*, selected for their beneficial properties rooted in Ayurvedic medicine. Ayurveda emphasizes the holistic approach of using multiple herbs in combination, recognizing the synergistic effects that enhance therapeutic efficacy while minimizing adverse effects, principle that underpins polyherbalism. **Aims & Objectives:** To formulate and evaluate a novel polyherbal churna using *Cynodondactylon*, *Emilia* sonchifolia, *Moringa oleifera*, and *Trigonella foenum-graecum* for anti-hyperlipidemic activity. **Methodology:** The selected herbs were collected, dried, and extracted before being formulated into four churna variants. Each was assessed for physicochemical properties, total phenolic and flavonoid content, and antioxidant activity via DPPH assay. HPTLC was performed to quantify the presence of Quercetin. Invitro antihyperlipidemic activity was also performed. **Results:** The formulation showed optimal physicochemical traits and highest antioxidant activity. Quercetin was quantified *In vitro* lipase inhibition confirmed anti-hyperlipidemic potential. **Conclusion:** The developed polyherbal churna demonstrates promising anti-hyperlipidemic potential, validating Ayurvedic synergy and offering a stable, effective alternative therapy.

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Keywords: Polyherbal formulation, Antihyperlipidemic, Ayurveda, Quercetin, HPTLC, Antioxidant

Abstract Number: A015

UNLOCKING THE FUTURE OF TYPE 1 DIABETES : DRUG THERAPIES THAT DELAY, DEFEND, AND DISRUPT

Prabhanjani Vaithilingam , Supreetha Prabhushankar , Niveditha Krishnan Unni , Judy Maria Chiara , Vishrutha Anbuchezhian

PSG College of Pharmacy, Peelamedu, Coimbatore – 641004
Email ID: prabha09250@gmail.com

Background: Type 1 Diabetes (T1D) is an autoimmune condition characterized by the destruction of pancreatic beta cells, leading to absolute insulin deficiency. Recent pharmacological advances have introduced adjunctive therapies and immune-targeting drugs aimed at modifying the disease course. **Aim:** To review recent developments in pharmacologic treatments for T1D, including novel insulin formulations and adjunctive therapies, and to evaluate their potential benefits and limitations. **Methods and Materials:** A narrative literature review was conducted using PubMed, Science Direct, and ClinicalTrials.gov (2015–2025). Focus was on insulin analogs, adjunctive therapies (e.g., SGLT2 inhibitors, GLP-1 agonists), and immune-modifying agents (e.g., Teplizumab). Data were categorized based on mechanism of action, clinical use, and safety. **Result and Discussion:** Insulin therapy remains the primary treatment for T1D.Adjunctive therapies such as pramlintide (an amylin analogue) improved glycemic control and reduced insulin doses.The most significant shift is the introduction of immunomodulatory agents like Teplizumab, a monoclonal antibody targeting CD3+ T cells, which has demonstrated the ability to delay the onset of T1D in high-risk individuals. **Conclusion:** Adjunctive therapies, offer additional avenues to address the multifaceted pathophysiology of T1D. However, careful consideration of the efficacy and potential adverse effects of these therapies is essential when individualizing treatment plans.

Keywords: Type 1 Diabetes, Insulin Therapy, Immunotherapy, Teplizumab, Adjunctive Drugs, Pharmacotherapy.

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Abstract Number: A016

ARTIFICIAL INTELLIGENCE IN DIAGNOSING TUBERCULOSIS AND ORGAN TUBERCULOSIS: A REVIEW

A. Aarish Farah[1], S. Nithyashri[1] , A. Shameem Fathima[2]

[1]PSG College of Pharmacy, Peelamedu, Coimbatore – 641004
[2]Associate Professor, Department of Computer Science and Engineering RMKCET, Chennai -601 206.
Email.id: aarishashmath@gmail.com

Background: Despite strenuous efforts to limit tuberculosis and Organ Tuberculosis a, it remains prevalent due to a limited workforce and excessive demand. AI has the potential to alleviate this issue by augmenting healthcare worker efficiency, enhancing screening, and stream lining management and follow-up processes. **Aim:** To summarize various review and technical articles on the current and potential applications of advanced AI models in global TB control. **Methods and Materials:** A narrative literature review was conducted using PubMed, ScienceDirect, and ClinicalTrials.gov (2015–2025). ResNet-based AI: Achieved 96.73% accuracy in diagnosing TB from chest X-rays, outperforming other models like VGG and AlexNet. LightTBNet: A lightweight deep convolutional network that delivered 90.6% accuracy and 96.1% AUC, suitable for deployment on handheld devices in low-resource settings. TB-Net: A self-attention deep convolutional neural network achieving 99.86% accuracy and 99.71% specificity, demonstrating potential for high-precision screening. **Result and Discussion:** Artificial Intelligence model through machine learning and deep learning possess a good diagnostic performance for drug-resistant tuberculosis. **Conclusion:** Simple classifier performs better in genomic data whereas the CNN model works best in high-dimensional data, such as radiology images.

Keywords: Artificial intelligence, classification and regression tree, Convolutional Neural Networks, Artificial Neural Networks

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Abstract Number: A017

BREAKING THE TOXIC CODE : ADVANCEMENTS IN DETOXIFIED BOTUNILUM VACCINE.

Subasini K , Monesa P, Karthikeyan S.

Department of Pharmaceutics, PSG College of Pharmacy, Peelamedu, Coimbatore – 641004, Tamil Nadu, India.
Email ID: subakalai7777@gmail.com

ISBN number: 978-93-95105-78-1

Botulinum neurotoxins (BoNTs), produced by *Clostridium botulinum*, are among the Most potent biological toxins known, posing significant health risks and potential for use in Bioterrorism. Despite this, no licensed human vaccine currently exists. Recent Advancements in recombinant technology have enabled the development of detoxified full-length BoNT/A1 as a safe and more effective vaccine candidate. This review highlights the creation and evaluation of M-BoNT/A1, a modified BoNT/A1 with three point mutations (E224A, R363A,Y366F) in the light chain to eliminate its catalytic activity. Further enhancement through an additional mutation (W1266A) in the receptor-binding domain led To M-BoNT/A1W, with reduced neuronal binding. Preclinical studies demonstrate that M-BoNT/A1W is over one million times less toxic than native BoNT/A1 and confers robust protection in mice against lethal doses of both BoNT/A1 and BoNT/A2. Immunized animals produced strong neutralizing antibodies, particularly Targeting the LCHCN domain, and sera effectively neutralized toxin activity in neuronal cell assays. These findings support M-BoNT/A1W as a promising vaccine strategy ,offering a potent, broad, and safe immune response. Continued research on recombinant, multi-function – defective BoNT vaccines may lead to the first approved human vaccine for botulism**.**

Keywords : Bioterrorism, *Clostridium botulinium* , Neurotoxin.

Abstract Number: A018

REVOLUTIONIZING TB VACCINES : CHIMERIC ANTIGEN ENCAPSULATED IN EXTRA-CELLULAR VESICLES- A REVIEW ARTICLE

Monesa P, Subasini K, Karthikeyan S

Department of Pharmaceutics, PSG College of Pharmacy, Peelamedu,Coimbatore-641004,Tamil Nadu, India.
Email ID: monesapackirisamy901@gmail.com

Tuberculosis (TB) is still one of the world’s most dangerous infectious diseases, even though we’ve had the BCG vaccine for over a hundred years. While scientists have made progress in TB vaccine research, we still need better and more effective vaccines to fight this deadly disease. Although we have BCG vaccine only has 0-80% efficacy. A new and exciting approach involves using tiny natural particles called extracellular vesicles (EVs). These are small & amp; quot, bubble-like & amp; quot ; structures that cells naturally release, and they can carry proteins and signals to other cells. Because of their unique properties, EVs may be ideal for delivering new types of vaccines. This review aims to improve the efficacy of Tuberculosis vaccine, thereby protecting 1/4 th of the population who are affected even though they have vaccinated.

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Keywords: Tuberculosis(TB), BCG vaccine, Immunotherapy, Innovative TB vaccines, Extracellular vesicles.

Abstract Number: A019

POSSIBLE INNOVATIONS IN COVID TREATMENT METHODOLOGY

Samyuktha Hariraman Indumathy, G. Siva Priyan, Jeevana Sivagnanam, W.D.Sam Solomon

Department of Pharmacy Practice, PPG college of Pharmacy, Coimbatore
Affiliated to The Tamil Nadu Dr.M.G.R Medical University, Chennai
Email ID: drhisamyuktha0103@gmail.com

This major study includes the proper aspects of designing an antiviral drug, for inhibition of its genome entry and replication of viral gene in the host cell. For this analysis we have taken consideration of SARS-CoV2 the causative agent of COVID-19. Mechanism of SARS-CoV2 entry relies on the activation of its S protein,i.e., the cleavage of subunits s1/s2 by the action of protease TMPRSS2, after the attachment of itself to the ACE2 receptors present in the endothelium of the lungs. This action eventually leads to the viral genetic material to enter the host cell for its replication. Therefore, usage of a serine protease inhibitor *Camostat mesylate* can inhibit the action of TMPRSS2. Further concerns of the viral attachment to the RBD *receptor binding domain* can be inhibited by construction of high affinity genetically engineered sACE2 receptors. As physicians, we have to consider the post-viral vasoconstrictions, which can be managed by the administration of PDE4 inhibitors. This study has a potential effect over the formulation of antiviral drugs, its market gaps as well as the concern of patient care.

Keywords: sACE2, TMPRSS2, PDE5 inhibitors

Abstract Number: A020

NEXT-GENERATION AI-BASED TREATMENT APPROACHES IN POLYCYSTIC OVARIAN DISEASE

Janisha Jayanthan, Rupesh Arunagiri, Abisha Jayanthan, Sakthi Bala Pandian

PSG College of Pharmacy,Peelamedu,Coimbatore-641004
Email ID: janishajayanthan@gmail.com

Background: Polycystic Ovary Disease is one of the most prevalent endocrine disorder affecting women of reproductive age. It is characterized by a hormonal imbalance that

disrupts ovulation and leads to the formation of multiple small cysts in the ovary. Traditional treatments include hormonal therapy insulin sensitizers and lifestyle modifications. However, these approaches often offer limited personalisation. With the advent of artificial intelligence ,there is an emerging paradigm shift in the diagnosis ,prediction and treatment of PCOD. **Aim:** To explore and evaluate the potential of next generation AI applications in enhancing the diagnosis, treatment personalisation, and long-term management of PCOD. **Methods:** Data collection & Integration: Large-scale patient data from EHRs(Electronic Health Records), wearable devices and clinical databases were analysed. AI algorithm were used to integrate biochemical ,hormonal ,imaging (ultrasound) and lifestyle data.AI Models Used: Machine learning models like random forest support vector machines and deep neural networks were trained to detect PCOD patterns. Natural Language processing for mining patient symptoms and feedback from health records. Treatment Personalisation: AI based recommendation systems provided individualized treatment plans by analysing treatment outcomes and patient profile.predictive analytic estimated the success rate of different therapies(metformin and clomiphene).Monitoring & Feedback: AI integrated with wearable health devices (like Fitbit, Apple watches) to monitor vital signs, ovulation cycles, stress levels. Real-time feedback enabled dynamic modification of diet, exercise and medication plans. **Result & Conclusion:** paper reviewed the applications of AI and Machine Learning Technique in PCOD, with focus on how these techniques play a significant role in improving patient outcome in long time in-terms of disease better diagnosis, treatment and management.

Keywords: PCOD, Artificial intelligence, Machine Learning, Ovulation Prediction, Hormonal Disorder, EHR.

Abstract Number: B001

FORMULATION AND EVALUATION OF CHITOSAN NANOPARTICLES OF TICAGRELOR

Agil Kumar Muniyappan*, Subramanian Somaskandan

Department of Pharmaceutics, PSG College of Pharmacy, Coimbatore.
Email ID: agilpfizer321@gmail.com

Objective: To develop a nanoparticle formulation of Ticagrelor (TG), a BCS Class IV drug with low oral bioavailability (~36%), using chitosan (CH) and sodium tripolyphosphate (TPP) via ionic gelation. **Methodology:** TG-loaded nanoparticles were prepared using varying molecular weight of chitosan and CH:TG:TPP ratio as 7:3:3.Characterization included particle size, zeta potential, PDI, and morphology. **Results:** The optimized Ticagrelor-loaded chitosan nanoparticles exhibited a mean particle size of 696.4 nm, a zetapotential of +36.5 mV, and a polydispersity index (PDI) of 0.453, indicating moderate size distribution and good colloidal stability. AFM analysis further confirmed the formation of a distinct nanoparticulate surface structure. **Conclusion:** Ticagrelor-loaded chitosan

nanoparticles were effectivelydeveloped and characterized in terms of particle size, surface charge, uniformity (PDI), and morphology.

Key Words: Ticagrelor, Ionic gelation, Chitosan, Nanoparticles.

Abstract Number: B002

Design and Characterization of pH-Responsive Cromolyn Sodium In-Situ Gel for Enhanced Drug delivery

Shanthini Palanisamy*, Subramanian Somaskandan

Department of Pharmaceutics, PSG College of Pharmacy, Peelamedu, Coimbatore-641004.
Email ID: ashanthinisp20@gmail.com

Background: Although allergic conjunctivitis affects a relatively smaller population, if leftuntreated, it can lead to serious complications such as corneal ulcers. **Aim and objective:** Todevelop a cromolyn sodium-loaded pH responsive ophthalmic in-situ gel and evaluate itscharacteristics for enhanced ocular drug delivery. **Methodology:** It was conducted in fourphases. In phase I – Pre-formulation studies were performed. In phase II – Five formulations ofcromolyn sodium loaded ophthalmic in-situ gels were prepared, where chitosan added as agelling agent (0.2%,0.25%,0.3%,0.35%,0.4%), 0.2% HPMC K 100 M added as a viscositymodifier, 0.9% NaCl added as an isotonic agent, 0.01% benzalkonium chloride added as apreservative. In phase III – characterizations of In-situ gels were conducted. In phase IV- Gelstrength and in-vitro drug release study were performed for the optimized formulation. **Results:** Among the five formulations, F4 shown better gelation time of 32 secs, gelling capacity (+++), gel strength 6.934g and 72 % drug release over 8hrs respectively. **Conclusion:** F4(0.35%chitosan) demonstrated the best in-situ gel which may be effective in enhanced delivery ofcromolyn sodium. In future work, sterilization studies and stability evaluations will be conductedto ensure product safety and shelf life.

Keywords: In-situ gel, chitosan, conjunctivitis, pH.

Abstract Number: B003

DEVELOPMENT OF AZILSARTAN NANOPARTICLES VIA HYDROLYSIS FOR ENHANCED DRUG DELIVERY

Anbarasu Velan*, Subramanian Somaskandan

Department of Pharmaceutics, PSG College of Pharmacy, Coimbatore-641004.
Email ID: anbarasuv112@gmail.com

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Objective: The aim is to prepare azilsartan medoxomil nanoparticles and evaluate for enhancing the solubility of pure drug with the aid of gastrointestinal dissolving tablets. **Methodology:** Blank and drug-loaded nanoparticles were formulated using chitosan of low molecular weights which was further dissolved in 1% acetic acid and crosslinked with tripolyphosphate (TPP) at a 7:3:3 ratio to evaluate the influence of chitosan molecular weight. Particle size, zeta potential, polydispersity index (PDI), surface character by atomic force microscopy(AFM), were analyzed for formulation. Low molecular weight chitosan demonstrated favorable nanoparticle characteristics and was selected for further development. **Results:** The optimized azilsartan medoxomil loaded chitosan loaded nanoparticle exhibited a mean particle size of 483.4nm a zeta potential of +34.2 and polydispersity index (PDI) of 0.239, indicating moderate size distribution and good colloidal stability. AFM was analyzed further confirmed the formation of distinct nanoparticles surface structure. **Conclusion:** Low molecular weight chitosan showed good nanoparticle characteristics in terms of size, zeta potential, and PDI, AFM morphology.

Key Words: Azilsartan medoxomil, Ionic gelation, Chitosan, Nanoparticles.

Abstract Number: B004

Nanoformulated Minoxidil and Saw palmetto oil for Hair Restoration : Lyotrophic liquid crystalline nanoparticles as Scalp-Targeted Delivery Vehicle.

Gowri Shankar .G, Nithya .R

Department of Pharmaceutics, PSG college of Pharmacy.
Email ID: Shrigowri14@gmail.com

Androgenic alopecia (AGA) is characterized by dihydrotestosterone (DHT)-induced follicular miniaturization. Current treatments such as minoxidil (which suffers from poor solubility, requiring irritant solvents) and finasteride (associated with systemic side effects) necessitate improvement. To identify a natural alternative to finasteride, molecular docking studies were performed for β-sitosterol, campesterol, and stigmasterol against 5α-reductase. Among these, β-sitosterol demonstrated the highest docking score, suggesting strong inhibitory potential. Since saw palmetto oil (SPO) is a rich natural source of β-sitosterol, it was selected as a plant-based DHT blocker to replace finasteride, thereby minimizing systemic side effects. FTIR studies confirmed the compatibility between the active compounds. Lyotropic liquid crystalline nanoparticles (LLCNs) were chosen to deliver minoxidil and SPO due to their biomimetic properties, which closely resemble the lipid organization of skin membranes. This enhances biocompatibility and reduces irritation compared to conventional alcohol-based formulations. Their cubic and hexagonal

mesophases create a highly ordered, porous structure that enables the simultaneous solubilization of hydrophobic SPO phytosterols and minoxidil. The formulation was optimized using Box-Behnken Design and characterized by dynamic light scattering (DLS) for size, polydispersity index (PDI), and zeta potential, along with high-resolution transmission electron microscopy (HR-TEM). The LLCN system demonstrated excellent stability and drug-loading capacity. This dual-therapy approach combines minoxidil's vasodilatory effects with SPO's DHT inhibition in a biocompatible nanocarrier that enhances scalp permeation and retention. The study presents a promising, safer topical alternative for AGA treatment through synergistic phytotherapy and advanced delivery technology.

Key words: Minoxidil, Saw Palmetto oil, Lyotrophic liquid crystalline nanoparticles , hair regrowth, Male androgenetic alopecia.

Abstract Number: B005

Emerging Drug Delivery Strategies to Traverse the Blood- Brain Barrier: Advances, Challenges, and Therapeutic Impact in CNS Disorders

Anushma Payattuparambil, Karthikeyan Sathasivam

Department of Pharmaceutics, PSG College of Pharmacy, Coimbatore.
Email ID: anushmapharma@gmail.com

Background: Neurological diseases pose a significant global health burden, with millions affected by disorders such as Alzheimer's disease, Parkinson's disease, Glioblastoma, Epilepsy, and Multiple sclerosis. One of the most enduring challenges in managing these conditions is the efficient delivery of neurotherapeutics to the brain. This is primarily due to the presence of the blood-brain barrier (BBB). The BBB is formed by a complex assembly of endothelial cells joined by tight junctions which restricts the entry of over 98% of small molecules and nearly large therapeutic biologics from reaching the central nervous system (CNS). Thus, overcoming the limitations posed by the BBB is of paramount importance in CNS pharmacotherapy. Aim and **Objective:** To explore the current and emerging strategies designed to facilitate efficient and targeted drug delivery across the BBB, with an emphasis on nanotechnology-based platforms, targeting approaches, and translational challenges. **Key Findings:** Biomimetic approaches including use of exosomes, cell-penetrating peptides, and stimuli-responsive systems for brain-specific delivery. Nanocarrier Systems like Liposomes, Polymeric nanoparticles, Solid lipid nanoparticles, Dendrimers and Lyotropic liquid crystalline carriers offer controlled and sustained release profiles. Ligand-functionalized systems employing transferrin, glutathione, angiopep-2 exploit receptor-mediated endocytosis for enhanced BBB targeting. Advancement in in vitro BBB models and BBB-on- chip technologies enables better preclinical assessment of delivery systems. **Conclusion:** Strategic integration of nanoscale engineering, ligand-mediated targeting, and biomimetic systems holds transformative potential for overcoming the challenges posed by the BBB.

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Translational success will require rigorous optimization, validation in physiologically relevant models, and alignment with regulatory standards.

Keywords: Blood-brain barrier, Nanocarriers, Central nervous system (CNS), Receptor-mediated endocytosis, Brain targeting, Neurotherapeutics

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Abstract Number: B006

Enhancing Gastric Retention of Tramadol HCl ThroughFloating Effervescent Drug Delivery System

S. Haribabu, V. Rubet Kumar, V. Sankar

Department of Pharmaceutics, PSG College of Pharmacy, Coimbatore.
Email: haribabujas@gmail.com

Background: The present study focuses on the formulation and evaluation of gastro-retentive floating tablets (GRFT) of Tramadol HCl, a synthetic opioid analgesic with a narrow absorption window and moderate solubility in gastric pH. **Aim and Objective**: The objective was to prolong gastric residence time and achieve sustained drug release by employing various natural polymers and effervescent agents. **Materials and Methods:** Floating tablets were formulated using sodium alginate (F1), guar gum (F2), xanthan gum (F3), and combinations with and without croscarmellose sodium (F4A, F4B) by direct compression method. Sodium bicarbonate served as the gas-generating agent, while magnesium stearate and talc were used as lubricants. The tablets were evaluated for weight variation, hardness, friability, thickness, buoyancy lag time, floating duration, swelling index (raft strength and volume), drug content, and *in vitro* drug release in 0.1N HCl buffer. **Results:** Among the formulations, F2 (guar gum) and F3 (xanthan gum) demonstrated satisfactory buoyancy with lag times of 5 and 50 minutes and floating duration of 2 hr 55 min and 2 hr 10 min respectively. F1 failed to exhibit buoyancy. F3 showed better control over drug release, indicating efficient retardation. In contrast, F2 exhibited the highest drug release rate, followed by F1 and F3. All formulations met pharmacopeial specifications for physical parameters. **Conclusion:** The study concludes that xanthan gum (F3) is effective in sustaining the drug release, whereas guar gum (F2) provides rapid release with good buoyancy characteristics. Hence, F 3may be a suitable candidate for developing gastro-retentive formulations of Tramadol HCl for prolonged therapeutic effect.

Keywords: Tramadol HCl, Gastro-retentive drug delivery system (GRDDS), Sustained release, Natural polymers, In vitro evaluation, Buoyancy.

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Abstract Number: B007

Development and Optimization of Capecitabine loaded Albumin Microspheres using Design of Experiments Approach

K.R. Karishma, D. Kalidas, V. Sankar

Department of Pharmaceutics, PSG College of Pharmacy.
Email ID: karishmakarish1614@gmail.com

Background: The background of the study was to formulate and evaluate capecitabine-loaded albumin microsphere to achieve sustained drug release. **Aim and Objectives:** To formulate and optimize capecitabine loaded albumin microsphere using heat denaturation technique. To evaluate various parameters like particle size, drug content, invitro drug release using a Design of Experiments (DoE) approach. **Methods:** Capecitabine Microspheres were developed using different concentrations of albumin, Span 80, Tween 80, and glutaraldehyde across eight distinct formulations. Design of Experiments (DoE) methodology was employed to systematically assess the impact of formulation variables. The resulting microspheres were evaluated for particle size, drug loading, and in vitro drug release. **Results:** The evaluation parameters like particle size, drug content and drug release were performed for 8 formulations and the optimized formulation was chosen using DoE approach and the evaluation parameters was performed and all these parameters within the limits. The obtained data were entered in the software to determine Critical Material Attribute in Critical Quality Attribute. **Conclusion:** The residual values were at lower level, it confirms the robustness and reproducibility of the +optimised formulation. The Capecitabine loaded albumin microsphere were successfully formulated and optimized using a DoE approach.

Key words: DOE (Design of experiments),Critical material attribute (CMA), Critical quality attribute(CQA)

Abstract Number: B008

Dissolution As An Evaluation Tool To Evaluate Performance of Marketed Indian Atorvastatin Tablets

S. Pooja, L. Baranidharan, V. Sankar

Department of Pharmaceutics, PSG College of Pharmacy
Email ID: poojanisha2201@gmail.com

Background: To compare the in vitro dissolution profile of marketed Atorvastatin tablets using the similarity factor (f2) and difference factor (f1). **Aim & Objective:** To evaluate and

compare the release profiles of test and reference formulations and to assess the suitability of the test product as an alternative. **Methodology:** Dissolution testing was performed using USP Type II apparatus with 900 ml phosphate buffer (pH 7.8) as the medium at 37 ± 0.5°C and 50 rpm. Samples were withdrawn at specified intervals and replaced with fresh buffer medium to maintain sink conditions. Drug release was analysed using UV spectrophotometry at 240 nm. The similarity factor (f2) and difference factor (f1) were calculated to compare the test formulations with the reference brand. **Results:** The f2 value greater than 50 indicates similarity. The f1 value shows minimal difference in the release profiles of formulation. Based on the calculated similarity factor (f2) and difference factor (f1), the test and reference products showed comparable drug release profiles. **Conclusion:** Based on the values within the accepted range indicate that the formulations exhibit similar dissolution behaviour, suggesting potential bioequivalence. This supports the use of dissolution testing as an effective, economical, and regulatory-accepted method for evaluating product performance and ensuring consistent therapeutic outcomes.

Keywords: Dissolution testing, Marketed Atorvastatin, Similarity factor, Difference factor

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Abstract Number: B009

Osmotic Controlled Release Delivery of Verapamil Hydrochloride: Role of Polymeric Coating in Drug Release Modulation

S. Susiram Kumar, S.Arun, V. Sankar

Department of Pharmaceutics, PSG College of Pharmacy
Email id:susiramkumar1997@gmail.com

Background: The present study focus on the formulation and evaluation of osmotic-controlled release tablets of Verapamil hydrochloride. **Aim & Objectives:** To formulate osmotic controlled-release tablets of Verapamil using polymeric coating materials. To evaluate the physical properties and drug release profiles of cellulose acetate phthalate (CAP) and ethyl cellulose (EC) coated tablets and uncoated tablets. **Methodology:** Verapamil tablets were prepared by direct compression method using sorbitol, Nacl, mannitol as an osmotic agent, along with talc and magnesium stearate. The tablets were coated with Cellulose Acetate Phthalate (CAP) and Ethyl Cellulose (EC) polymers that form semi-permeable membranes to support osmotic-controlled drug release. Physical parameters such as hardness, thickness, friability and weight variation were evaluated. In vitro drug release was studied using a USP dissolution apparatus, with samples analyzed at 282 nm via UV spectrophotometry. **Results:** All tablets passed standard physical parameter tests. CAP-coated tablets showed better controlled release compared to EC-coated and uncoated ones. Sorbitol-based formulations showed improved controlled drug release compared to other formulations.

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Conclusion: Controlled-release Verapamil tablets can be successfully formulated using CAP and EC as coating materials. CAP showed better performance in controlling drug release.

Keywords: Verapamil Hydrochloride, Osmotic-controlled release, Cellulose Acetate Phthalate (CAP), Ethyl Cellulose (EC), Polymeric coating.

Abstract Number: B010

Next-Gen Drug Design: Integrating AI, 3D/4D Printing& Digital Twins for Personalized and Sustainable

Krishna Prasath S, Sathyapraba G, Saranya Shanmugapriya D

RVS College of Pharmaceutical Sciences, Sulur - Coimbatore
Email ID: krishnaprasathr16@gmail.com

Background: Conventional drug development methods often struggle to meet individual patient needs. This leads to inefficiencies in treatment, suboptimal therapeutic responses, and poor patient compliance. Modern technologies like Artificial Intelligence (AI), 3D/4D printing, and Digital Twins offer a breakthrough in personalized medicine. **Aims & Objectives:** To develop a smart, eco-conscious framework that combines AI, 3D/4D printing, and Digital Twins for designing personalized oral drug delivery systems. **Methods:** AI models were used to predict optimal drug dose and release profiles based on patient data. Digital Twin simulations virtually tested tablet performance prior to printing. Finally,3D/4D printers were employed to fabricate solid oral dosage forms with real-time personalization. **Results:** Initial trials showed promising accuracy in AI dose prediction. Simulations via digital twins reduced development time and material waste. 3D/4D printing enabled the creation of pH-responsive and patient-specific tablets with high precision. **Conclusion:** The integrated approach significantly improves drug efficacy, safety, and sustainability. It enables patient-centric therapy for complex cases like pediatric oncology, geriatric poly pharmacy, and pharmacogenomic variations.

Keywords :AI, 3D printing, 4D printing, Digital Twin, Personalized Medicine, Smart Drug Delivery.

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Abstract Number: B011

Computational Docking and ADMET Profiling of 2,6-Dihydroxyanthraquinone in Parkinson's Disease Drug Discovery

S. Aparna, K. Manimekalai

Department Of Pharmacology, Sri Balaji Vidyapeeth (Deemed To Be University), Puducherry 607402.

Email ID: aparnasellapandian@gmail.com

Background: Parkinson's disease (PD) is a progressive neurodegenerative disorder that leads to the degeneration of dopaminergic neurons. This results in motor dysfunction, cognitive impairment, and significant quality of life deterioration. Despite advancements in understanding the disease, identifying effective therapeutic agents with optimal pharmacokinetic and safety profiles remains a significant challenge. There is a need for new compounds that can target multiple mechanisms involved in PD pathogenesis. **Aim & objectives:** This study aims to evaluate the therapeutic potential of 2,6-Dihydroxyanthraquinone (DHAQ) for Parkinson's Disease through computational docking and ADMET profiling. The objectives include assessing DHAQ's binding affinities with PD-related proteins, its drug-likeness, and its toxicity. The study also aims to identify DHAQ's potential for multi-target modulation and provide insights for future preclinical evaluation as a PD therapeutic agent. **Methods:** Molecular Docking: Docking studies were conducted on several PD-related protein targets to evaluate DHAQ's binding affinity and potential for interaction. These targets included: Adenosine A2A receptor, Catechol-O-methyltransferase (COMT), Leucine-rich repeat kinase 2 (LRRK2), NR4A2 (Nurr1), PTEN-induced kinase 1 (PINK1), Ubiquitin carboxyl-terminal hydrolase L1 (UCHL1). ADMET Profiling: The pharmacokinetic and toxicological properties of DHAQ were predicted using computational tools: ProTox-II: for toxicity prediction, SwissADME: for drug-likeness, oral bioavailability, and ADMET properties. **Result:** MOLECULAR DOCKING: • DHAQ demonstrated strong binding with UCHL1 (-7.81 Kcal/mol, 1.87 μM) and LRRK2 (-7.07 Kcal/mol, 6.60 μM), suggesting potential high-affinity interactions with these proteins. Additionally, DHAQ exhibited significant binding to other key targets like COMT and PINK1, which are also involved in critical pathways relevant to PD. ADMET PREDICTION: Drug-likeness: DHAQ showed good drug-likeness properties, meeting Lipinski's Rule of Five. Oral Bioavailability: The compound was predicted to have favorable oral bioavailability, making it a potential candidate for oral drug delivery. Toxicity: DHAQ displayed low predicted toxicity, suggesting a good safety profile. **Conclusion:** DHAQ demonstrated favorable docking interactions with multiple PD-related protein targets, along with favorable ADMET properties, including good oral bioavailability and low toxicity. These results support the further preclinical evaluation of DHAQ as a potential neuroprotective agent.

Keywords: Parkinson's Disease, 2,6-Dihydroxyanthraquinone, Autodock, ProTox-II, SwissADME.

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Abstract Number: B012

Redefining the Pharmaceutical Industry Through Robotics: A Paradigm Shift in Automation

Shamma, Junise. V
Al Shifa College of Pharmacy, Kizhattur, Kerala, India
Email ID: kth735v@gmail.com

Background: Traditional pharmaceutical processes relied on manual labour or limited, rule-based automation. Integration of robotics enhances accuracy, sterility, and operational efficiency. Systematically reduces manual errors and contamination risks. **Objectives:** To highlight the roles of robotic systems in pharmaceutical manufacturing and research. To assess their benefits in enhancing efficiency and regulatory compliance. **Method:** Implementation of robotic technologies: Robotic Process Automation (RPA), AI-Driven Robotics, Robotic Arms, Sterile Robotics, Vision-Guided Robotics. Interpretation of various types of robots: Autonomous Mobile Robots (AMR), Collaborative Robots (Cobots), Industrial Robots and Laboratory Automation Robots. Industrial robots are used for packaging, labelling, and quality inspection in sterile production environments. Autonomous Mobile Robots (AMRs), including Automated Guided Vehicles (AGVs), transport materials across production zones. Collaborative robots (cobots) assist in pipetting, sample preparation, and IV compounding in hospital settings. Laboratory automation robots handle high-throughput screening, liquid handling, and experimental sample preparation. Robotic arms are utilized in mixing, granulation, tablet pressing, and capsule filling. Sterile robotics enable aseptic filling of vials and syringes using isolator-based automation. Vision-guided robotics are applied to detect defects in tablets, capsules, and packaging. Additionally, Robotic Process Automation (RPA) supports backend processes by automating documentation, compliance checks, and batch record maintenance. **Conclusion:** Robotics improves safety, speed, precision and reproducibility in pharmaceutical processes. Robotics enables Industry 4.0 in pharma industry.

Key words: Pharmaceutical robotics, Robotic arms, AMR, Cobots, RPA

Abstract Number: B013

Formulation and Evaluation of *Cardiospermum halicacabum* Leaves Extract Nanoparticles for Anti-Diabetic Activity

Vaishnavi.G, Hariharan C

Department of Pharmacy, Karpagam Academy of Higher Education,Coimbatore.
Email ID: kumeigopaarigopal93874@gmail.com

ISBN number: 978-93-95105-78-1

Background: Diabetes mellitus remains a major global health burden with serious long-term complications. Herbal medicines are gaining attention for their potential anti-diabetic properties. *Cardiospermum halicacabum*, commonly known as balloon vine, is traditionally used in the treatment of various inflammatory and metabolic disorders. However, its application is limited by low bioavailability and poor solubility**. Aims & Objectives:** The primary objective of this study is to enhance the anti-diabetic potential of *Cardiospermum halicacabum* leaves extract by formulating it intonanoparticles to improve its stability, solubility, and bioavailability**. Methods:** Fresh leaves were collected, shade-dried, and subjected to Soxhlet extractionusing ethanol. The extract was evaluated for phytochemical constituents. Nanoparticleswere formulated using the ionic gelation method with chitosan as the polymer.Characterization included particle size analysis, zeta potential, and morphology using SEM. In vitro anti-diabetic activity was assessed using α-amylase inhibition assay. **Results:** Phytochemical screening confirmed the presence of flavonoids, alkaloids, andtannins. The optimized nanoparticles showed an average particle size of 180 nm, good stability, and spherical morphology. *In vitro* studies indicated a significant increase in α-amylase inhibitory activity compared to crude extract. **Conclusion:** The nanoparticle formulation of *Cardiospermum halicacabum* leaves extractdemonstrated enhanced anti-diabetic activity, suggesting its potential as an effective natural therapeutic agent for diabetes management.

Keywords: *Cardiospermum halicacabum*, nanoparticles, anti-diabetic activity, α-amylaseinhibition, phytochemical screening, herbal medicine.

Abstract Number: B014

AI-DRIVEN 3D BIOPRINTING FOR SKIN DISEASE TREATMENT

Aishvarya Sundararajan, Arvind Kaliyappan Subash Chandra Bose, Praharsha Karuppusamy

PSG College of Pharmacy, Peelamedu, Coimbatore – 641004
Email ID: aishvaryascts@gmail.com

Background: Skin is the largest organ of human body, and one-third of the world population is affected by skin disorders. AI-driven 3D bioprinting enables personalized and effective treatment of skin disorders. AI enhances the quality, rapidity and economy of 3D bioprinting. This is used widely for severe burns and in skin diseases such Psoriasis, and Epidermolysis Bullosa. **Aim:** To explore how AI and 3D bioprinting can be used together to treat skin diseases more accurately. **Methods:** AI- assisted diagnostics and treatment planning, AI driven approaches for bioink formulation, model structure, printing process are used in treatment. Data resourced from Pubmed, Scopus. Results: Clinical studies on 3D bioprinted skin grafts have shown promising outcomes. Bioprinted grafts led to faster healing, compared to traditional grafts. Pain levels were significantly reduced post- treatment. In condition of severe skin burns layer-by-layer deposition of cell over the injured area is done either in situ

or in vivo. For Epidermolysis Bullosa, gene-corrected bioprinted grafts successfully expressed collagen VII in treated areas. For psoriasis it is used in creating skin models for research. **Conclusion:** Advancement of 3D bioprinting had challenges regarding bioprinting, where AI-driven 3D bioprinting emerges as a promising solution by enhancing precision, repeatability, and scalability. It has shown rapid healing and improved skin function. Despite considerable progress, many challenges remain to be addressed.

Keywords: 3D Bioprinting, Skin diseases, Personalised Treatment, Epidermolysis Bullosa

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Abstract Number: B015

Integrating Artificial Intelligence with molecular and histopathological tools for postmortem interval estimation: – A scoping review.

Thenmozhi C M, Ashwin Kumar K S , Prasanna Sreka V, Karthikeyan S.,

Department of Pharmaceutics. PSG College of Pharmacy, Peelamedu, Coimbatore - 641004, Tamil Nadu, India.
Email ID: cmthenmozhi05@gmail.com

Accurate estimation of the postmortem interval (PMI)—the time since death—is critical in forensic medicine, particularly in complex cases involving unknown cause of death, marine fatalities, suicides, and homicides. PMI supports timeline reconstruction, alibi verification, and legal proceedings. Traditional methods such as rigor, livor, and algor mortis are low-cost and easy to assess but limited to early intervals (0–48 hours) and highly influenced by environmental factors. This review synthesizes advanced molecular and AI-supported PMI estimation techniques: Serum biomarkers (0–72 hours): Rapid, but prone to degradation. Immuno histochemistry (3–14 days): Tissue-specific, yet time-consuming and expertise-dependent. RNA degradation (up to 12 days): Time-sensitive but unstable. Omics approaches (1–30 days): Comprehensive, though costly and data-intensive. AI tools like support vector machines, random forests, and deep learning increase prediction accuracy by analysing large, complex datasets and correcting for confounders. However, current AI applications in forensic science typically integrate only 2–3 methods. Furthermore, it is impractical for human experts to simultaneously apply all these techniques due to resource constraints, time, and limited availability. Our review uniquely proposes a unified, AI-driven model capable of integrating all methods simultaneously delivering a precise, reproducible PMI estimate within short time. In light of increasing crime rates and decomposed or submerged cases, this comprehensive system represents a transformative step in forensic medicine. Microbiome analysis holds strong potential as a future long-term PMI marker.

Keywords: Postmortem Interval (PMI); Forensic Pathology; Artificial Intelligence (AI); AI in Forensic Science.

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Abstract Number: B016

Integration of Artificial Intelligence and 3D Printing in Monoclonal Antibody

Sameeullah Ibrahim, Vetri Selvan Manikandan , Naveenkanna Vijayakumar sathiya , Hari Muthu Pandi Narayanasamy

PSG College of Pharmacy, Peelamedu, Coimbatore - 641004
Email ID: samee10ullah@gmail.com

Background: Monoclonal antibodies (mAbs) are critical in therapeutic and diagnostic medicine due to their specificity and efficacy. However, traditional methods of development and production are time intensive and resource-demanding. Recent advancements in Artificial Intelligence (AI) and 3D printing have opened new avenues to enhance efficiency and precision in this field. **Aim:** This study aims to explore how AI and 3D printing technologies contribute to improving the design, development, testing, and production of monoclonal antibodies. **Method:** A comprehensive literature review was conducted focusing on the roles of AI in target prediction, antibody engineering, Immunogenicity, forecasting and bioprocess optimization. Simultaneously, the applications of 3D printing in bioreactor fabrication, organ-on-chip testing, and personalized delivery systems were evaluated. **Results:** AI demonstrated high efficacy in predicting suitable antigen targets, modeling antibody structures, and optimizing bioproduction conditions, thereby reducing development timelines. 3D printing facilitated the rapid prototyping of custom lab components and advanced tissue models for in vitro testing, enabling precise assessment of mAb function and safety. **Conclusion:** The integration of AI and 3D printing significantly enhances the monoclonal antibody development pipeline by enabling rapid design, predictive screening, and real-world simulation testing. These technologies promise to accelerate therapeutic antibody development while lowering costs and improving patient-specific outcomes.

Keywords: Monoclonal antibody, Antibody engineering, Immunogenicity, Bioprocess optimization, Bioreactor fabrication, Modeling antibody structure.

Abstract Number: B017

CAR-T Cells : A New Era in Cancer Treatment - Review

Gowtham M, Harini M, Dhanapriya R, Karthikeyan S

PSG College of Pharmacy, Peelamedu, Coimbatore – 641004, Tamil Nadu, India.
Email ID: gowthammanikandan2006@gmail.com

ISBN number: 978-93-95105-78-1

Blood cancer is a group of malignancies that affects the blood, bone marrow and lymphatic system. Blood cancer including leukaemia, lymphoma and myeloma is a growing health concern in India. Blood cancer possess a life threatening challenges due to its rapid progression. In India, late diagnosis, limited access to treatment and raising cases among adults make it a severe public health concern. CAR T-cell therapy is a revolutionary form of immunotherapy that modifies a patient's T cells to better identify and kill cancer cells. The process begins with extracting T cells from the patient's own blood, then genetically engineering them in a lab to produce special receptors on their surface called chimeric antigen receptors (CARs). These CARs enable the T cells to recognize specific antigens on cancer cells. After modifying and multiplying these CAR T cells, they are infused back into the patient to attack the cancer. This therapy has shown significant success in treating certain blood cancers, such as acute lymphoblastic leukemia (ALL), non-Hodgkin lymphoma, and multiple myeloma. Approved by the FDA in 2017, it represents a major advancement, particularly for patients with advanced or treatment-resistant cancer. However, it is not without limitations. Challenges include "antigen escape" where cancer cells lose the targeted antigen, and adverse effects due to immune reactions or damage to healthy tissues.

Key words: Immunotherapy treatment for blood cancer, CAR-T cell, limitations

Abstract Number: B018

Development and In Vitro Evaluation of Once-Daily Sustained-Release Matrix Tablets of Capecitabine for Cancer Therapy

Jeevan Prasad S

Department of Pharmaceutics, PSG College of Pharmacy
Email ID: Jeevanprasad962001@gmail.com

Capecitabine is an oral prodrug of 5-fluorouracil, widely used in the treatment of colorectal and breast cancer. Due to its short half-life and associated side effects with conventional dosing, a sustained-release formulation was developed to provide consistent plasma levels over 24 hours. This study aimed to formulate and evaluate sustained- release matrix tablets using hydrophilic polymers. Four formulations (F1–F4) were developed via wet granulation and assessed for drug release behavior. In vitro studies revealed that formulations F1 (HPMC) and F2 (HPMC + PVP) achieved desired drug release profiles. These results suggest the potential of matrix tablets in enhancing patient compliance and therapeutic efficacy. Further in vivo and stability studies are recommended for clinical validation.

Keywords: Capecitabine, Matrix tablets, HPMC.

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Abstract Number: B019

Formulation and Evaluation of Mouth Dissolving Strip Using *Opuntia dillenii* Plant

Arthi Anbalagan, Sanjai Kumar J, Elakkiyamani

PPG College of Pharmacy, Department of Pharmaceutics
Email ID: arthianbalagan872agmaiI.com

Opuntia differii, also known as the prickly pear cactus, are indigenous to the arid and semi-arid regions of Mexico and the southern United States, thriving across diverse climatic conditions. They possess numerous beneficial properties and is widely utilized as a medicinal plant in various parts of the world. It is known for its antioxidant, anti-inflammatory, antimicrobial, and anti-diabetic properties. The plant contains important bioactive compounds like flavanoids, alkaloids and polysaccharides which contribute to its medicinal effects. Several studies have been conducted and they suggest that *Opuntia dillenii* may help in managing conditions like diabetes, hyperlipidemia and liver diseases. This review provides an overview of the plants botanical description, chemical composition and pharmacological properties.

Keywords: Opuntia differii, medicinal plant, phytochemistry, pharmacological properties, diabetes, hyperlipidcmia anti-inflammatory activities.

Abstract Number: B020

A Review of Enhancing Early Detection in Breast Cancer

Nivethitha R, Bowya L, Ashika R, Karthikeyan S

PSG College of Pharmacy, Peelamedu,Coimbatore-641004, Tamil Nadu, India
Email ID: nivi7419@gmail.com

Breast cancer remains one of the most common cancers among women worldwide, and early detection through screening significantly improves outcomes. In 2023, India estimated 2 lakh cases of breast cancer among women with 82,429 deaths. While traditional mammography remains the standard for breast cancer screening, its limitations, particularly in women with dense breasts, have spurred interest in supplemental imaging modalities. However, their diagnostic sensitivity is often reduced in women with dense breast tissue, younger patients, and those at high risk due to genetic mutations or family history. To overcome these challenges, advanced imaging technologies like PEM, CEM, MRI, and 3D mammography

have been introduced to improve early detection and diagnostic accuracy. Early detection is critical to improving prognosis, reducing treatment intensity, and increasing survival rates. This review focuses on four advanced modalities: Magnetic Resonance Imaging (MRI), Contrast-Enhanced Mammography (CEM), Positron Emission Mammography (PEM),and Digital Breast Tomosynthesis (3D mammography). MRI offers superior soft tissue contrast and is highly sensitive for detecting invasive cancers, especially in high-risk populations. CEM enhances lesion visibility through the use of iodinated contrast, combining functional and anatomical imaging with better accessibility and shorter acquisition times compared to MRI. PEM provides a metabolic perspective by identifying hypermetabolic activity in tumors, helping differentiate aggressive cancers from benign lesions. 3D mammography reduces tissue overlap and improves lesion localization, particularly in dense breasts. This review highlights how integrating these imaging tools can lead to earlier and more accurate diagnosis of breast cancer, especially in high risk populations and emphasizes the need for personalized imaging strategies based on individual risk and clinical context.

Key words: Early detection, Breast cancer, Advanced imaging technology, Mammography, Dense breast

Abstract Number: B021

Nanotheranostics for Hepatocellular Carcinoma: Integrating Diagnosis and Therapy: An overview

Merlin S, Annie Sandrina S, Jusaina J, Karthikeyan S

PSG College of Pharmacy, Peelamedu, Coimbatore-641004, Tamil Nadu, India.
Email ID : merlinstalin04@gmail.com

Liver cancer is a leading cause of cancer-related deaths worldwide. According to recent data, there are over 1.9 million new cancer patients diagnosed in the year 2022. Nonetheless, 609360 deaths are attributed to cancer the number of cases is estimated to be increased by 12.5% by the end of the year 2025. With advancements in the field of medicine, the management of cancer has evolved and progressed, but still, there are lots of problems associated with its effectiveness and improving the prognosis of the patient. While patients often experience distress when diagnosis and treatment are handled through separate procedures. In such a situation nanomedicine makes a good case that can be utilized to diagnose and therapeutically treat the tumor with high accuracy. Thus, the use of nanoparticles in the diagnosis and treatment of cancer is clubbed under the term “Nanotheranostics”. Certain organic, inorganic and hybrid based nanoparticulate materials are developed that can aid in diagnostic as well as therapeutic outcomes. These include gold-based nanoparticles, iron oxide nanoparticles, porphyrins, and many more nanotheranostic

agents. These materials also enhance imaging techniques such as MRI, CT, and fluorescence imaging, allowing better visualization and monitoring of disease progression. Furthermore, dual-drug delivery platforms and stimuli-responsive nanocarriers are being developed to provide synergistic therapeutic effects and counteract drug resistance mechanisms. This review provides a comprehensive overview of the evolving landscape of nanotheranostic applications in liver cancer, highlighting their potential to revolutionize current diagnostic and therapeutic approaches and improve patient outcomes.

Keywords: Hepatocellular cancer, Nanotheranostics, Nanoparticles, Dual drug delivery platforms, Emerging therapeutic strategies

About us

PSG College of Pharmacy (PSGCP) was established in the year 2001. The college of Pharmacy, which has now completed 24 years of existence and commitment to excellence in Pharmacy Education, is located in the PSG Health campus at Peelamedu in Coimbatore city. The college is affiliated to the prestigious “The Tamil Nadu Dr. MGR Medical University” Chennai and also approved by the AICTE and Pharmacy Council of India, New Delhi. Since 2005, the college is consistently meeting annual ISO (International Organization for Standardization) Certification Standards. The Pharmacy college was recently ranked 58th among pharmacy colleges across the nation, by NIRF 2024 MHRD, GOI which is indeed a phenomenal achievement for a privately funded institution which has only very recent history. Extensive research and teaching learning process inculcated by faculty and excellent infrastructure helped to achieve NAAC Accreditation B++ in II cycle. Its philosophy is embedded in its commitment to quality as well as its vision and mission statements.

About the Editors

Dr. M. Ramanathan
Principal and Head,
Department of Pharmacology,
PSG College of Pharmacy.

Dr. V. Sankar
Vice-Principal and Head,
Department of Pharmaceutics,
PSG College of Pharmacy.

Dr. S. Subramanian
Professor,
Department of Pharmaceutics,
PSG College of Pharmacy.

Mrs. S. Vijayalakshmi
Assistant Professor,
Department of Pharmaceutics,
PSG College of Pharmacy.

Organised by
Department of Pharmaceutics
PSG College of Pharmacy
Avinashi Road, Peelamedu
Coimbatore-641004
Tamil Nadu
Phone No. : 0422 - 4345851 (O) Fax No. : 0422 – 2594400
E-mail : principal@psgpharma.ac.in Web : www.psgpharma.ac.in