PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, new Delhi & Affiliated to Kurukshetra University, Kurukshetra)

AN AUTONOMOUS INSTITUTE

INSTITUTION'S INNOVATION COUNCIL

"CONFERENCE PROCEEDINGS"

ROLE OF A PHARMACIST

वसुधैव कुटुम्बकम

FROM THE BENCH → PATIENT'S BEDSIDE

APSE-PIET CONFERENCE

INTERNATIONAL CONFERENCE ON

ROLE OF A PHARMACIST FROM THE BENCH TO THE BEDSIDE OF THE PATIENT

Organized By

DEPARTMENT OF PHARMACY

In Collaboration With

ASSOCIATION OF PHARMACEUTICAL SCIENTISTS & EDUCATORS (APSE)

December 04 & 05, 2025 | PIET, Panipat, Haryana

Convenor
Prof. (Dr.) Parveen Kumar Goyal

Conference Chair
Prof. (Dr.) Gaurav Agarwal

About the Theme of the Conference

The conference theme **"Role of a Pharmacist – From the Bench to the Bedside"** highlights the pharmacist's evolving journey from drug discovery to direct patient care. It emphasizes their critical role in translating scientific research into safe and effective therapies, as well as guiding clinical decisions at the bedside.

In an era of personalized medicine and rapid innovation, pharmacists bridge the gap between laboratory breakthroughs and the delivery of healthcare. The theme reflects their growing responsibility in ensuring therapeutic efficacy, patient safety, and ethical practice. By exploring this continuum, the conference aims to inspire dialogue on emerging technologies, interdisciplinary collaboration, and the future of pharmacy education—empowering professionals to lead across both scientific and clinical domains.

Call for Papers

We are inviting papers for presenting e-posters. Delegates can submit their abstract and full papers, in the below-mentioned areas, based on the conference theme, on or before 17-11-2025 at pharm.int.conf2025@piet.co.in

Guidelines for Abstract Submission

Title: Times New Roman, 12 bold font size in sentence case.
Affiliation: Authors' names (bold) and affiliations (italic) should be mentioned below the title in Times New Roman, 11 font size. The presenting author must be the first and superscripted with an asterisk.
Abstract: The abstract should contain a maximum of 250 words and 5 keywords, in Times New Roman, 11 font size.

Areas for Submission of Papers

- Drug discovery and development
- Design and development of formulations; NDDS
- Quality Control and Assurance; Traditional and Synthetic Medicines; Herbal Drugs; Cosmetics; Regulatory Affairs.
- Pharmacology and Toxicology; Pharmacovigilance; Clinical and Hospital Pharmacy; Community Pharmacy
- Role of AI, Machine-Learning, & Robotics in Healthcare, etc.

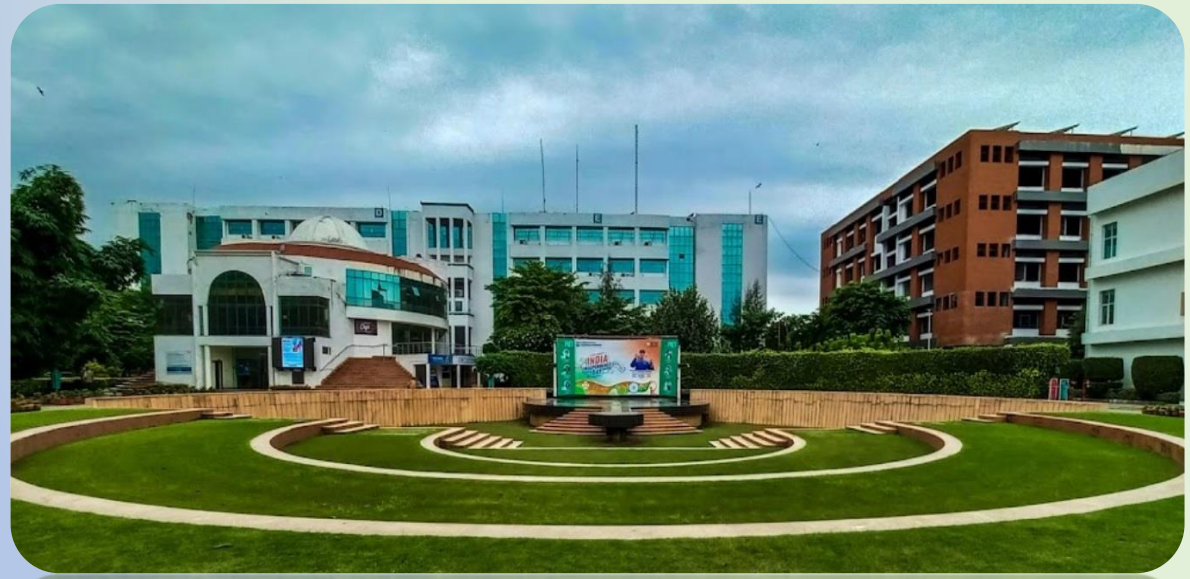
Guidelines for E-poster Presentation

The e-poster should contain a one-page PDF or one slide, or one page with text and pictorial presentation. It should not contain multiple pages or slides. The time for the poster presentation will be 8 minutes, including a 2-minute discussion.

About PIET

Panipat Institute of Engineering and Technology (PIET), Samalkha is a premier **NAAC "A" accredited autonomous institution**, affiliated with Kurukshetra University and approved by the AICTE. Established in 2006, PIET offers a diverse portfolio of undergraduate, postgraduate, and doctoral programs in engineering, pharmacy, management, and applied sciences. The Department of Pharmacy runs B. Pharm and D. Pharm programs affiliated with Pandit B.D. Sharma University and HSBTE, respectively.

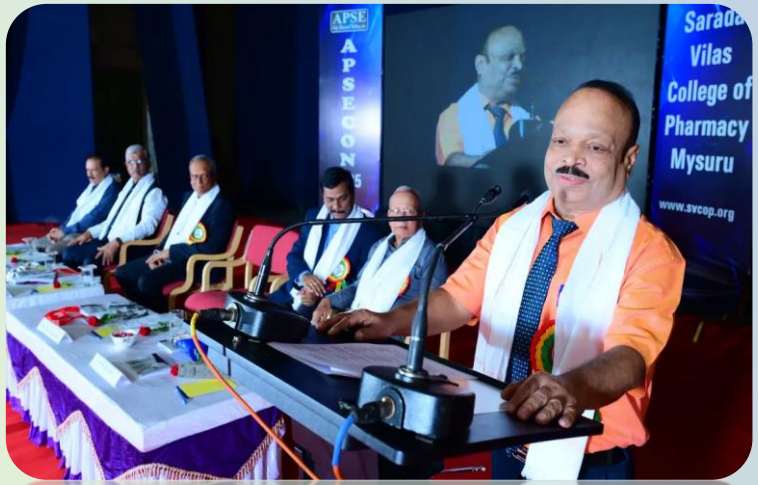
Strategically located on NH-44 near Delhi, PIET boasts NBA accreditation in five departments and a vibrant campus culture focused on innovation, entrepreneurship, and Industry 4.0 readiness. Flagship initiatives like the Assured Placement Programme, Institutional Innovation Cell (IIC), and **RISE (Research Innovation Start-up & Entrepreneurship)-Haryana's largest incubation centre-** empower students to transform ideas into ventures. The AICTE-funded IDEA LAB further nurtures creativity in STEM. With cutting-edge infrastructure, industry-aligned curriculum, and a commitment to excellence, PIET stands as a beacon of transformative education in North India.

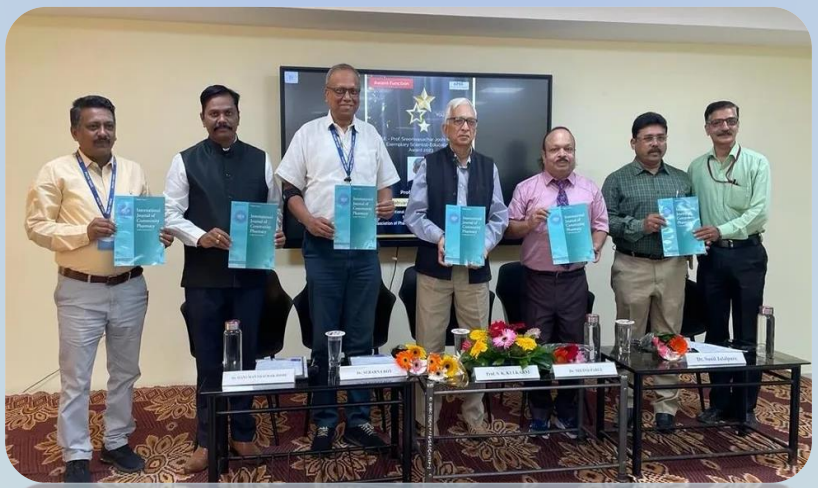


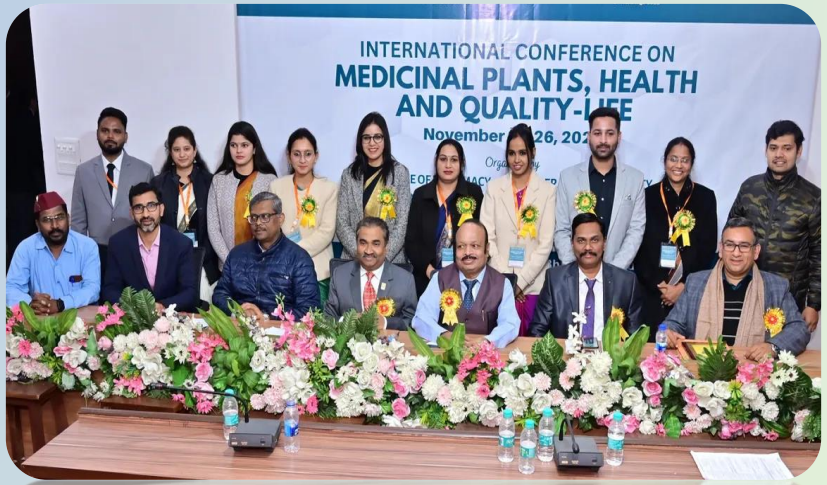
About APSE

The Association of Pharmaceutical Scientists and Educators (APSE) is an internationally renowned professional body committed to advancing pharmaceutical education, research, and innovation. APSE serves as a vibrant platform for educators, researchers, and industry professionals to collaborate, share knowledge, and promote excellence in pharmaceutical sciences.

With a strong network of academic institutions and scientific experts, APSE organizes conferences, workshops, and training programs that foster interdisciplinary learning and global engagement. It nurtures a community of thought leaders and innovators who make meaningful contributions to pharmaceutical advancements and public health. Through strategic partnerships and academic outreach, APSE plays a pivotal role in shaping future-ready professionals and promoting ethical, evidence-based practices in pharmacy education and research.







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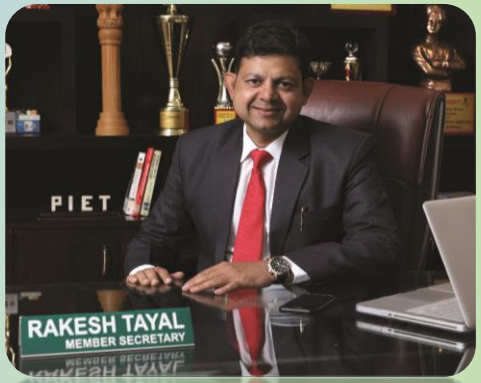
Chairman, PIET



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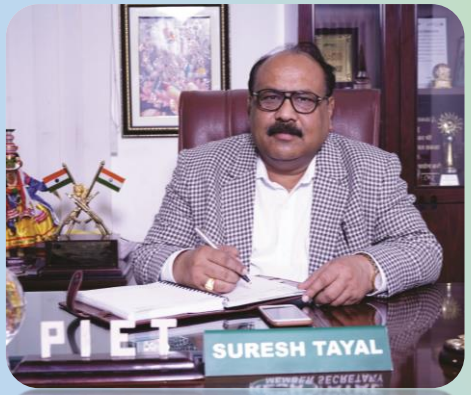
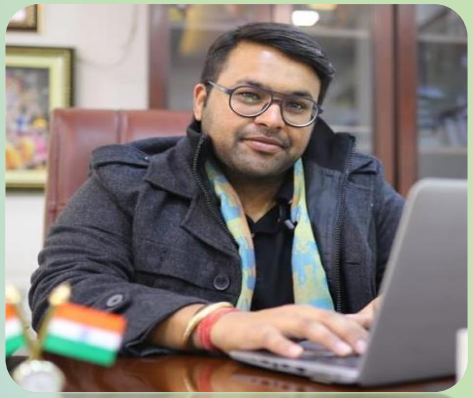


Shri Suresh Tayal
Member Secretary, PIET



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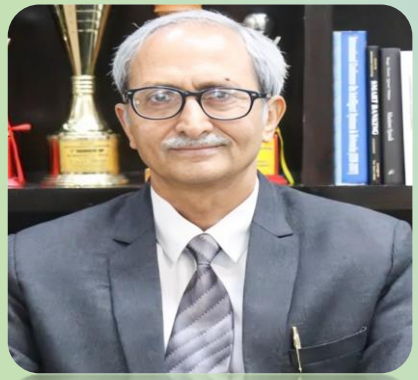
Prof. (Dr.) Shakti Kumar
Director, PIET



Prof. (Dr.) J.S. Saini
Dean Engg., PIET

Prof. (Dr.) Milind Parle
President, APSE

Dr. Hanumanthachar Joshi
Secretary, APSE

LOC Heads

Prof. (Dr.) Gaurav Agarwal
Conference Chair

Prof. (Dr.) Parveen Kr. Goyal
Convener

Local Organizing Committee (LOC)

Core Committee					
Prof. (Dr.) Gaurav Agarwal	**Conference Chair**	7015848427	**Dr. Benu Chaudhary**	**Co-convener**	8544784492
Prof. (Dr.) Parveen Kr. Goyal	**Convener**	9416243212	**Prof. (Dr.) Sonia Narwal**	**Co-convener**	7206421864
Prof. (Dr.) Daisy Arora	**Co-convener**	9992222427	**Dr. Shiva**	**Co-convener**	9671878036

Scientific Committee	
Prof. (Dr.) Daisy Arora	9992222427
Dr. Kavita Sangwan	8814997274
Dr. Shiva	9671878036
Dr. Arti Soni	8813025251

Registration Committee	
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Ms. Palika Sehgal	7508982019
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Mr. Om Prakash	8684018486

Medical & Helpdesk Committee	
Mr. Tarun Kapoor	9729826560
Mr. Vinod	7357060707
Mr. Umesh	9813653200

Venue Arrangement & Decoration Committee	
Ms. Garima Mittal	9416633009
Ms. Palika Sehgal	7508982019
Ms. Archana Kaushik	7355821597
Ms. Ritu	8571892028

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Mr. Hardik	8813992400
Dr. Benu Chaudhary	8544784492

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Toll Free: 1800 120 6884

Association of Pharmaceutical Scientists and Educators (APSE): www.theapse.in

MESSAGES

भारतीय भेषज संहिता आयोग
स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार
सैक्टर - २३, राज नगर,
गाजियाबाद - २०१ ००२, उत्तर प्रदेश, भारत

सत्यमेव जयते
IPC

INDIAN PHARMACOPOEIA COMMISSION
Ministry of Health & Family Welfare, Government of India
Sector - 23, Raj Nagar
Ghaziabad-201 002 (U.P.), INDIA

डॉ. वी. कलईसेलवण
सचिव-सह-वैज्ञानिक निदेशक
F.No.IPC/1010/2025-26

Dr. V. Kalaiselvan,
Secretary-cum-Scientific Director
Dated 1st December, 2025

MESSAGE

It is with great pleasure that I extend my warm greetings for PIET-APSECON 2025: A Conference on **"Role of Pharmacist-From the Bench to the Bedside of the Patient"** being organised on 4- 5 December 2025.

The pharmacist's role has evolved from traditional dispensing to becoming a cornerstone of modern healthcare. This conference addresses a critical dimension: how pharmacists contribute across the entire continuum, from drug development in research laboratories to direct patient care in clinical settings.

Today's pharmacists bridge pharmaceutical sciences and clinical practice, translating complex scientific knowledge into tangible patient benefits. They ensure medication safety, optimise therapeutic outcomes, and serve as accessible healthcare advocates across diverse settings-from formulation labs to hospital wards to community pharmacies.

I commend the organising committee for bringing together academicians, researchers, practitioners, and students to explore how pharmaceutical expertise can enhance patient care while maintaining the highest professional and ethical standards.

The journey from bench to bedside requires scientific rigour, technical competence, empathy, and unwavering commitment to patient welfare. The knowledge shared and partnerships forged during this conference will strengthen pharmacy practice and elevate the pharmacist's vital role in healthcare delivery.

May this conference inspire innovative approaches, forge lasting collaborations, and contribute meaningfully to patient-centred pharmaceutical care.

Best Wishes!

(Dr. V. Kalaiselvan)

MESSAGE FROM THE CHIEF PATRONS

It is our privilege to extend warm greetings to all distinguished delegates, speakers, researchers, industry professionals, faculty members, and students participating in *PIET-APSECON 2025*, organised by the Department of Pharmacy at Panipat Institute of Engineering and Technology (PIET) in collaboration with the Association of Pharmaceutical Scientists and Educators (APSE). This conference stands as a testament to the institute's unwavering commitment to fostering academic excellence, advancing scientific inquiry, and strengthening collaboration between industry and academia.

The theme, **"Role of a Pharmacist – From the Bench to the Bedside of the Patient,"** is particularly relevant in today's rapidly evolving healthcare environment. Pharmacists now play crucial roles not only in dispensing medications but also in drug discovery, formulation development, regulatory affairs, clinical research, patient counselling, pharmacovigilance, and evidence-based therapeutic decision-making. The conference highlights these multifaceted responsibilities and provides a platform to explore how pharmacists can continue to impact public health and contribute to the development of safer, more effective treatment strategies.

We appreciate the inclusion of the Industry–Academia Conclave and the Hands-on HPLC Workshop, which will provide valuable exposure and practical knowledge to participants. We are confident that the discussions and interactions during this conference will inspire progressive thinking and lead to meaningful contributions to the healthcare ecosystem.

We congratulate the organisers and wish all delegates a productive, enriching, and memorable experience at PIET.

Sh. Hari Om Tayal
Chairman, PIET

Sh. Suresh Tayal
Member Secretary

Mr. Rakesh Tayal
Vice Chairman

Mr. Shubham Tayal
Member, BoG

Panipat Institute of Engineering & Technology
An Autonomous Institution under Section 2(f) of UGC Act 1956
Approved by A.I.C.T.E., New Delhi & Affiliated to Kurukshetra University, Kurukshetra and Pt. B.D. Sharma University of Health Sciences, Rohtak.
NBA- Accreditation MBA, MCA, B.Tech. (CSE), B.Tech. (IT) & B.Tech. (ECE)
A –GRADE– NAAC ACCREDITED

Ref. No: PIET/25/24894 Date: 3/12/2025

MESSAGE

It gives me immense pleasure to extend my warm greetings to all participants of the International Conference **PIET-APSECON 2025, organised by the Department of Pharmacy at** Panipat Institute of Engineering and Technology (PIET) in collaboration with the Association of Pharmaceutical Scientists and Educators (APSE). The theme of the conference, *"Role of a Pharmacist – From the Bench to the Bedside of the Patient,"* is both timely and significant as it captures the evolving and multifaceted responsibilities of pharmacists in the global healthcare landscape.

Today, pharmacists are no longer confined to the traditional boundaries of dispensing medications. They play a critical role in drug research & development, regulatory affairs, clinical decision-making, patient counselling, and therapeutic drug monitoring. With the rise of personalised medicine, advanced diagnostics, and interdisciplinary healthcare models, the pharmacist's contribution has become indispensable in ensuring safe, effective, and compassionate patient care.

This conference provides an excellent platform for researchers, educators, students, and practitioners to connect, collaborate, and share innovations that can shape the future of pharmacy practice. The exchange of ideas through plenary sessions, e-poster presentations, and discussions will undoubtedly enrich our collective understanding and inspire new directions for research and professional development. The Industry–Academia Conclave will provide an exceptional platform for bridging theoretical knowledge with practical expectations, allowing students, researchers, and professionals to engage in meaningful dialogue with leaders from the pharmaceutical and healthcare sectors. The Hands-on HPLC Workshop, on the other hand, represents the commitment to skill-based learning and technical excellence.

I congratulate the organising committee for their dedicated efforts in bringing together experts from diverse domains, and I extend my best wishes to all delegates for a productive and insightful learning experience. May this conference ignite curiosity, strengthen collaboration, and empower each one of you to contribute meaningfully to the advancement of healthcare and the pharmacy profession.

Prof. (Dr.) Shakti Kumar
DIRECTOR

70 KM MILESTONE, VILLAGE PATTIKALYANA, G.T. ROAD, SAMALKHA, PANIPAT-132103, HARYANA
Mobile No.-9069547000, 9069548000 | E-mail:- info@piet.co.in | Web. – www.piet.co.in

MESSAGE

It is a matter of great pride and academic fulfilment to welcome all distinguished speakers, researchers, industry professionals, and students to the International Conference PIET-APSECON 2025, hosted by the Department of Pharmacy, Panipat Institute of Engineering and Technology (PIET), Panipat, in collaboration with the Association of Pharmaceutical Scientists and Educators (APSE)

The chosen theme, "Role of a Pharmacist – From the Bench to the Bedside of the Patient," truly reflects the dynamic transformation of the pharmacy profession and highlights the expanding scope of pharmacists as essential contributors to modern healthcare.

In today's rapidly evolving scientific environment, pharmacists are emerging as innovators, clinical experts, community educators, and vital decision-makers in therapeutic care. From pioneering research and technology-driven drug development to ensuring safe medication practices and personalised patient support, the profession continues to evolve in remarkable ways.

This conference is expected to provide a meaningful opportunity to explore these developments, strengthen academic-industry connections, and promote a culture of inquiry and collaboration among young minds.

I am confident that the discussions, scientific sessions, and knowledge exchange will inspire innovative perspectives and enable a deeper understanding of the challenges and possibilities in the pharmaceutical sector.

I extend my sincere appreciation to the organising team for their dedication and vision, and I convey my best wishes to all the attendees for an enriching experience.

May this conference catalyse new ideas, meaningful collaborations, and continued excellence in pharmacy education, research, and practice.

Best wishes

Dr. J.S. Saini
Dean Engineering
PIET

MESSAGE

It is a moment of immense pride and satisfaction to witness the organisation of **PIET-APSECON 2025** by the Department of Pharmacy, PIET, in collaboration with the Association of Pharmaceutical Scientists and Educators (APSE). I extend my heartfelt congratulations to the entire organising team for bringing together distinguished academicians, researchers, industry leaders, innovators, and young scholars on a unified platform committed to advancing pharmaceutical sciences.

The conference theme, **"Role of a Pharmacist – From the Bench to the Bedside of the Patient,"** aptly reflects the evolving and critical contribution of pharmacists across the healthcare continuum. From research and development to clinical practice and patient care, pharmacists today play a pivotal role in shaping therapeutic advancements and improving health outcomes.

The inclusion of key events such as the **Industry–Academia Conclave** and the **Hands-on HPLC Workshop** demonstrates our dedication to promoting practical skill development, fostering industrial collaboration, and strengthening the readiness of our students to meet global professional standards. Such initiatives not only enhance scientific exchange but also inspire confidence, competence, and innovation among budding professionals.

I truly appreciate the sincere efforts of the organizing committee in creating a platform that facilitates meaningful interaction, encourages progressive thinking, and nurtures future leaders of healthcare. I am confident that the knowledge shared and the connections established during this conference will lead to impactful contributions to pharmacy education, research, and industry.

I extend my best wishes to all delegates for a productive, enriching, and memorable experience at **PIET-APSECON 2025**.

Dr. Gaurav Agarwal
Principal, Department of Pharmacy
Conference Chair, PIET-APSECON 2025

MESSAGE

It gives me immense pleasure to welcome you all to the **International Conference PIET-APSECON-2025**, being held on **4–5 December 2025 at Panipat Institute of Engineering and Technology (PIET), Samalkha, Panipat, Haryana** on the theme *"Role of a Pharmacist – From the Bench to the Bedside of the Patient."*

Pharmacy today stands at the crossroads of science, technology, and patient care. The theme of this conference emphasizes the pharmacist's pivotal journey—transforming laboratory innovations into clinical solutions, ensuring drug safety through vigilant monitoring, and ultimately serving as a trusted healthcare professional at the patient's bedside. It highlights the seamless integration of research, technology, and compassionate practice that defines the modern pharmacist's role in society.

The technical sessions will explore diverse and contemporary areas including **pharmacovigilance, drug discovery, and the role of AI in pharmacy**, while the **hands-on workshop on HPLC** will provide participants with practical exposure to advanced analytical techniques. A highlight of the conference is the **Industry–Academia Conclave**, where eminent industry experts and principals of pharmacy colleges from across the nation will engage in meaningful dialogue to bridge the gap between academic training and industrial expectations.

We are privileged to host distinguished professors, senior academicians, and thought leaders whose insights will enrich our collective understanding and inspire future directions in pharmaceutical education, research, and practice.

On behalf of PIET, I extend my heartfelt gratitude to all delegates, speakers, and participants for joining us in this endeavour. I am confident that PIET-APSECON-2025 will not only stimulate intellectual exchange but also foster collaborations that strengthen the pharmacist's journey from the laboratory bench to the patient's bedside.

I wish the conference great success and look forward to fruitful deliberations.

Dr. Parveen Goyal

Convener, PIET-APSECON-2025

Panipat Institute of Engineering and Technology (PIET)

Samalkha, Panipat, Haryana

Message

Pharmacists play a crucial role in the healthcare system by ensuring that patients receive safe and effective medications. They are responsible for making medicines easily available to the common man at a reasonable price, advising patients on drug interactions, side effects, and also for collaborating with other healthcare professionals to optimize patient outcomes. Furthermore, pharmacists educate patients on disease management, medication compliance, and lifestyle modifications. They also serve as drug information experts. I applaud the dedication, precision, and commitment of both the local organizing committee and the office bearers of the APSE in orchestrating this grand international event. I am confident that the deliberations of the **APSE-PIET-2025** event, being held on the PIET campus on the highly relevant theme, **"Role of a Pharmacist from the bench to the bedside of the patient",** will stimulate meaningful discussions, ignite fresh perspectives, and pave the way for impactful collaborations leading to global health improvement. Wishing all delegates a fruitful, enriching, and memorable experience.

With Warm Regards,

Dr. Milind Parle
President, Association of Pharmaceutical Scientists and Educators (APSE)
Editor-in-Chief, Journal of Modern Pharmacology and Pathology Section
Editor: Current Science,
Professor of Pharmacology, Ex. Dean,
Faculty of Pharmaceutical Sciences,
Guru Jambheshwar University of Science and Technology ('A+' Grade NAAC Accredited University), Hisar (Haryana).

Association of Pharmaceutical Scientists & Educators (APSE)®

Only Research Nothing Else

Dr. Milind Parle
President

Dr. Hanumanthachar Joshi
Secretary

MESSAGE

It is with immense pleasure and pride that I extend my warm greetings to all delegates, researchers, academicians, healthcare professionals, and students participating in the **International Conference on "Role of a Pharmacist – From the Bench to the Bedside"**, scheduled to be held on 4–5 November 2025, PIET, Panipat, India.

Association of Pharmaceutical Scientists and Educators, founded in 2022, registered with Registrar of Societies, India. APSE has a distinguished history of conducting research and educative conferences, webinars and symposiums that has had a significant impact on society. It is a forum for encouraging and strengthening the bond among scientists and academicians around the world.

This conference has been conceptualized with the vision of highlighting the evolving role of pharmacists in modern healthcare—from laboratory-based research to direct patient care. The theme strongly reflects the dynamic transformation of the pharmacy profession, where pharmacists are no longer confined to the laboratory or dispensary, but are emerging as key contributors in clinical decision-making, patient counselling, pharmacovigilance, and personalized medicine.

I am confident that this academic gathering will provide an excellent platform for meaningful interactions, exchange of innovative ideas, and collaborative research opportunities among national and international participants. The deliberations during this conference will certainly contribute to strengthening pharmaceutical education and advancing healthcare outcomes.

I congratulate the organizing committee for their dedicated efforts in making this event a success and wish all the participants a productive, enriching, and memorable academic experience.

With best wishes,

Dr. Hanumanthachar Joshi
Secretary, Association of Pharmaceutical Scientists and Educators
Principal, Sarada Vilas College of Pharmacy, Mysuru

No. 309, Abdhyodaya Apartments, Somanath Nagar, Dattagalli 3rd Stage, MYSURU-570022, India
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MESSAGE

India is known as the "Pharmacy Hub of the World" in view of tremendous progress in pharmaceutical production of best quality drugs and vaccines at an affordable price. The present Indian pharmaceutical market is about $ 50 billion, and it is expected to reach $128- 130 billion by 2030. This phenomenal growth of the Indian pharmaceutical industry is achieved by the involvement of eminent pharmaceutical scientists and pharmaceutical technocrats. The Indian pharmaceutical industry is supplying about 40% of US generic drugs and 50% of the global vaccines market.

Quality Pharmaceutical Products need to be carried to the benefit of patients in the hospital setting and to the community. Pharmacists play a pivotal role in providing these health care services from bench to bedside of the patient. Pharmacists' major responsibilities include the transport of high-quality drugs from the laboratories to the consumer point, drug dispensing, and patient counselling about the proper administration of drugs to get the best outcome of drugs for the suffering humanity.

Two-days International Conference "APSE –PIET INTERNATIONAL CONFERENCE ON 'ROLE OF PHARMACIES FROM THE BENCH TO THE BESIDE OF THE PATIENT scheduled on 4th & 5th of December 2025 at Panipat Institute of Engineering and Technology is a milestone of Pharmaceutical Sciences in drug dispersing at bedside in hospital or clinical settings.

This gives me great pleasure to appreciate the management and faculty of Panipat Institute of Engineering and Technology in organizing and executing this two-day conference in collaboration with APSE in the translation of pharmaceutical products for the healthcare benefits of society.

We take pleasure in welcoming the delegates, academicians. research scholars, faculty members, and healthcare professionals to gain insights into modern healthcare systems in transforming drug benefits to the welfare and wellness of the common man.

Two days' scientific proceedings of the conference will provide innovative ideas and insights to the participants in drug discovery design and development of novel molecules for the treatment and management of existing and emerging diseases.

On behalf of APSE and on my own behalf, I take great pride in appreciating PIET in conducting this conference and creating a new history of the Pharmacist's role in enhancing quality of life.

With kind regards of great appreciation, and best wishes for the grand success of **APSE –PIET INTERNATIONAL CONFERENCE ON "ROLE OF PHARMACIES FROM THE BENCH TO THE BESIDE OF THE PATIENT.**

Prof. Dr. A.K. GNANACHANDRAN,
Ex Pharmacists Supervisor MOH KSA
Professor & Principal, Pranav Institute of Pharmaceutical Sciences and Research, Gwalior

SPEAKERS

Lalit Kumar Goel

State Drugs Controller Haryana

Qualification: B. Pharm, L.LM,

- Passed B. Pharmacy from College of Pharmacy, Belgaum (KTK) in the year 1990.
- Joined as Drugs Inspector in the year 1994 at Gurugram (Haryana)
- Received Best Drugs Inspector Award in the Year 2001 at Mumbai given by
- All India Drugs Control Officers Confederation for the maximum detection of spurious drugs.
- Founder Member of AIDCOC.

Dr. Kunal Nepali

M.PHARM, Ph.D, Post doc (Organic/Medicinal Chemistry)

Dr. Kunal Nepali, M.Pharm., Ph.D., is an accomplished medicinal and organic chemist currently serving as an Associate Professor at the School of Pharmacy, Taipei Medical University, Taiwan. With 13 years of teaching experience and over 4 years of post-doctoral research, he has established himself as a leading researcher in anticancer drug design and synthetic medicinal chemistry.

Dr. Sameer Dhingra

Associate Professor and Head,

Department of Pharmacy Practice, NIPER Hajipur

Dr. Sameer Dhingra is Associate Professor and Head, Department of Pharmacy Practice, NIPER Hajipur (Dept. of Pharmaceuticals, Govt. of India). He also coordinates the Adverse Drug Reaction Monitoring Centre (PvPI) and the Regional Training Centre (MvPI), contributing to drug and medical device safety across Eastern India.

With over two decades of experience in pharmacy education, clinical research, regulatory sciences, infectious diseases, and capacity building, he focuses on skill development in Pharmacovigilance, Materiovigilance, AMR, TB care, and patient safety. He has led numerous training programmes, workshops, and certificate courses for healthcare and industry professionals in online, hybrid, and in-person formats.

Dr. Dhingra has active collaborations with IPC Ghaziabad, Mahavir Cancer Sansthan, IGIMS, AIIMS (New Delhi, Jodhpur & Patna), ICMR-RMRIMS, and industry partners including Innomagine Consulting, IQVIA, Natco Pharma, and Reliance Life Sciences. These partnerships support industry-ready training modules in Drug & Medical Device Safety, AMR, Infection Prevention, Retail Pharmacy, and Medical Sales.

He has been listed among the World's Top 2% Scientists (Stanford University, 2023–2024) and has over 15,000 citations (h-index 40; i10-index 76). He is on Editorial Board of various journals and also a peer-reviewer for many journals. He serves on PvPI's Quality Review Panel and contributes widely to academic and regulatory communities. His research spans Infectious Diseases (TB, AMR), drug and device safety, HTA, and AI-driven patient safety.

He is also a committed voluntary blood donor with 25+ lifetime donations

Dr. Suresh Verma
Drugs Control Officer

Dr. Suresh Verma is working as Drugs Control Officer, Food and Drugs Administration, Gurgaon. He has qualified his B. Pharmacy, M. Pharmacy and Ph. D degree from Department of Pharmaceutical Sciences, Guru Jambheshwar University of Science & Technology, Hisar. He has more than 10 years experience of Teaching, Industry, Research, Sale, Marketing and Administration. Dr. Suresh Verma has published 2 books of International Publishers. He has also published more than 35 research and review papers in National and International journals with total impact factor more than 100. Dr. Verma has attended 30 International & National conferences. Dr. Suresh Verma has awarded CV Raman Fellowship, UGC-JRF Fellowship and AICTE fellowship. He has awarded first prize in the 7th Regional Training Programme on Capacity Building of State Drugs Regulators of Rajasthan, Haryana and Delhi organised by CDSCO and FDA Rajasthan.

Dr. Pushpinder Kaur

Lecturer

Government Polytechnic for Women, Chandigarh

Pushpinder Kaur is a dedicated pharmacy academician with over **22 years of teaching experience** and currently serves as a **Lecturer at Government Polytechnic for Women, Chandigarh**. She holds an **M.Pharmacy in Pharmaceutical Chemistry** and qualified **GATE (1999)** with **88.8 percentile**, along with securing the **45th rank** in the **National Pharmacy Talent Search Exam (2011)**.

She has contributed significantly to academia and professional training—establishing a **Model Pharmacy as per NEP-2020**, acting as a **resource person** at national events, and receiving the **Outstanding Motivator Award (2023)**. With industry experience in QA and QC roles, she also enriches learning through her **133+ educational YouTube lectures**.

Her work includes research on **stress degradation studies of Cetirizine**, active participation in national health campaigns, and leadership in institutional roles such as admissions, training & placement, and ICT training.

Dr. Rishi Kumar

Drugs Inspector

Rishi Kumar is a pharmaceutical professional with 20 years of experience across drug regulation, pharmacovigilance, research, and academia. He is currently serving as a Drugs Inspector at the Central Drugs Standard Control Organization (CDSCO), North Zone, Ghaziabad, where he oversees regulatory enforcement, inspections of pharmaceutical manufacturing sites, medical devices, blood centres, and investigations related to spurious and substandard drugs.

He previously worked at the Indian Pharmacopoeia Commission (IPC) for over a decade, contributing extensively to the Pharmacovigilance Programme of India (PvPI) as Scientific Assistant, Senior Pharmacovigilance Associate, and QA/QMS lead. His work included ADR assessment, quality system development, signal detection, ISO documentation, and nationwide training of pharmacovigilance professionals. Mr. Kumar has also served as a Research Associate at DRDO-INMAS, focusing on QMS, dossier preparation, and laboratory research for radioprotective drug development. Earlier in his career, he worked in academics as Assistant Professor and Lecturer, along with project roles at IIT Delhi.

He holds a Ph.D. (2024) from Amity University and an M.Pharm (Distinction) from BIT Mesra. His research interests include pharmacovigilance, herbal formulation development, intellectual property rights, and Indian systems of medicine. He has authored numerous research papers and book chapters and has presented at national and international forums, including WHO meetings and conferences abroad.

A certified trainer under PvPI, he has conducted more than 20 national training programmes for healthcare professionals, technical associates, and industry stakeholders.

Dr. Mukesh Nandave
Associate Dean (Research & Consultancy) Head,
School of Pharmaceutical Sciences Delhi Pharmaceutical Sciences and Research University (DPSRU),
New Delhi.

Dr. Nandave earned his Ph. D. in Pharmacology from AIIMS, Delhi and received his Post-Doctoral training from the Division of Cardiothoracic Surgery, the Ohio State University Medical Center, Columbus, USA. Since more than 12 years Dr. Nandave has been investigating the role of nutraceuticals, herbomineral formulations, plant extracts & constituents for Myocardial ischemia & reperfusion injury, Diabetes, Obesity, Pain management. He has published more than 65 papers in peer-reviewed national and international journals. His overall citations are now at 761 with an H-index of 17. His lab received more than 1.5 crore total funding from Govt. as well as industry including Dabur, Charak, Madhavbaug, Sandu etc. Dr. Nandave has received numerous awards including G. Achari Gold Medal by Indian Pharmacological Society; Association of Pharmaceutical Teachers of India (APTI) Young Pharmacy Teacher of the Year Award, the Indus Foundation's Award for Research Excellence; Early Investigator Award by International Society for Heart Research, Prof. DuggiralaVisweswaram & Prof.SreemantulaSatyanarayana Prize; Best Research Output of the Year for 2014-2015, 2013-2014, and 2012-2013 Award" of SVKM's NMIMS University. Dr. Nandave is life member of various professional bodies including International Society for Heart Research (ISHR), International Academy of Cardiovascular Sciences (IACS); Indian Pharmacological Society (IPS); Indian Pharmaceutical Association (IPA); Association of Physiologist and Pharmacologist of India (APPI); Association of Pharmaceutical Teachers of India (APTI); and Society for Ethnopharmacology.

Dr. Ashok Kumar Thallur Gopi
Scientist
Teva Pharmaceuticals Inc., Florida,
USA

Ashok Kumar Thallur Gopi is an accomplished pharmaceutical scientist and currently serves as Director of Product Development at Teva Pharmaceuticals Inc., Florida, USA. With over 25 years of experience, he has led the development of solid oral, liquid, and topical pharmaceutical formulations for the U.S. and global markets. His expertise spans formulation design, scale-up, technology transfer, and regulatory-compliant product development, contributing significantly to Teva's diverse portfolio and global impact in generic and specialty medicines.

Dr. Milind Parle

President, Association of Pharmaceutical Scientists and Educators (APSE)

Professor of Pharmacology, Ex. Dean,

Faculty of Pharmaceutical Sciences,

Guru Jambheshwar University of Science and Technology ('A+' Grade NAAC Accredited University), Hisar (Haryana).

Dr. Milind Parle currently serves as **President** of Association of Pharmaceutical Scientists & Educators (APSE). He formerly served as **Dean, Faculty of Medical Sciences**, and has also held positions including **Chairman – Department of Pharmaceutical Sciences**, **Chairman – Department of Physiotherapy**, and **Dean, Faculty of Pharmaceutical Sciences** at GJ University of Science & Technology (formerly in Hisar, Haryana) and its predecessor institutions.

His academic-administrative career spans **over 40 years** of teaching, research, and administration.

He was honored with Pharmacy Teacher of the Year – 2016 by the Association of Pharmacy Teachers of India (APTI) — a prestigious recognition of his teaching and academic leadership.

He has received many "Best Research Paper" awards — more than **65–70 awards** in national and international conferences. As a senior educator and administrator, Dr. Parle contributed significantly to building academic and research infrastructure at GJ University / its predecessor — often joining institutions at early stages and helping build research culture from ground-up.

He has served as an Expert / Reviewer / Evaluator for several national bodies including AICTE, Pharmacy Council of India (PCI), UPSC, UGC, ICMR, NBA and other expert committees — especially for areas like accreditation, ethical experimentation in animals/humans, doctoral evaluation etc.

Dr. Hanumanthachar Joshi

Secretary, Association of Pharmaceutical Scientists and Educators

Principal, Sarada Vilas College of Pharmacy, Mysuru

Dr. H. Joshi is a distinguished pharmaceutical academician and neuroscientist, currently serving as **Principal, Sarada Vilas College of Pharmacy, Mysuru**. With a prolific research record of **352 publications**, **21 patents**, an **h-index of 23**, and multiple national and international recognitions, he is widely respected in the fields of **neurosciences, dementia research, and pharmacognosy**.

He has received prestigious international honors including the **Young Scientist Award**, **Young Investigator Scholarship**, and several **travel fellowships** from the **National Institutes of Health (USA)**, **National Institute on Aging**, **Alzheimer's Association (USA)**, **Alzheimer's Drug Discovery Foundation (UK)**, and **IBRO**. His biography has been featured multiple times in **Marquis Who's Who in the World** and the **International Biographical Centre, Cambridge**.

Nationally, he has been awarded the **Innovative Research in Neurosciences Award (2021)**, **Mother Teresa Award (2018)**, **Best Principal Award (2020)**, **Rotary Datta Eminent Teacher Award (2022)**, and the prestigious **Rajyotsava Award (2024)**.

A prolific author, Dr. Joshi has written several influential books, including *Guiding Light – Navigating the Landscape of Dementia*, *Live Your Life with Dementia*, and *Ageing and Cancer*, along with textbooks in pharmacognosy, microbiology, and pharmaceutical jurisprudence. He has also secured research grants from leading agencies such as **ICMR, DBT, UGC, RGUHS, VGST, and AYUSH**.

Prof. Dr. A. K. Gnanachandran,
Parnav Institute of Pharmaceutical Sciences & Research,
Gwalior

- **25+ years** of academic and leadership experience in reputed pharmacy institutions across India, and **10 years** of international service as Pharmacist & Pharmacist Supervisor in the **Ministry of Health, Saudi Arabia**.
- Holds **B.Pharm and M.Pharm** (with distinction) from **Madurai Medical College**; trained in **IV fluids**, **oral dosage forms**, **pyrogen testing**, and **analytical evaluation** of APIs and formulations.
- Completed **Ph.D. research at DRDE, DRDO Gwalior**, contributing to safer tear gas compounds for **NBC (Nuclear, Biological & Chemical) warfare** applications.
- Career spans pharmaceutical marketing, academia, research, and clinical pharmacy; has mentored numerous UG/PG pharmacy students.
- Frequent **resource person and speaker** at national and international conferences; trained paramedical staff globally in disease recognition, diagnosis, and management.
- Recognized **Clinical Pharmacist in Allergy Management**, specializing in **Pharmacotherapy** and **Sublingual Immunotherapy**.
- Recipient of major awards:
    - **Best Pharmacist Award – Ministry of Health, KSA**
    - **Lifetime Achievement Award – Madurai Medical College Alumni Association**
    - **Fellowship – Indian Pharmacy Graduates Association (IPGA)**
- Holds advisory roles:
    - **Domestic & International Advisor – Operant Pharmacy Federation**
    - **State Advisor – TN All Registered Pharmacists Welfare Association**

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PIET-APSECON-01

Evaluation Of Acetylcholinesterase Inhibitory Potential (*In-Vitro)* In Different Roots Extracts Of *Nardostachys Jatamansi*

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Abstract

Alzheimer's disorder (AD) is the major widely occurring and persistent kind of dementia among age-associated neurological conditions and is estimated to impact approximately 66 million individuals by 2030. *Nardostachys jatamansi*, D. Don, DC, which is commonly known as Jatamansi is an widely used as medicinal herb for management of several illness. Owing to a number of limitations with conventional extraction methods, green extraction methods are now employed in terms of improve pharmacological potential and phytochemical recovery with consumption of lower energy and ecofriendly way. In view of above, different extract of Jatamansi roots, extracted by conventional methods of Soxhlet method (J-SM) and Jatamansi roots extracted by ultrasonic assisted extraction method (J-UM) and furthermore, evaluate the acetylcholinesterase (AChE) inhibition (*In-vitro)* of different extracts. This study exhibited the improved AChE inhibitory potential by J-UM (69.78±0.76 µg/ml) in comparison to J-SM (66.53±1.30 µg/ml). Such green extraction methods are now widely used in terms of improved extraction efficiency of extracting crude herbal extract in an eco-friendly way as compared to conventional. These findings suggested that extracts of Jatamansi roots having the pharmacological potential in terms of AChE inhibition, which may indicate its therapeutic potential for the management of AD. Thus, it can be said that such green methods for extracting the selected herb might be scaled up at a commercial level in terms to satisfy the growing demand for herbal extract. This preliminary finding confirms the potential of selected herb for AChE inhibitory potential and further study can be explored at molecular level.

Keywords: Alzheimer's disorder, *Nardostachys jatamansi* AChE, green extraction method, extraction

PIET-APSECON-02

Molecular Docking Study Approach To Identify Bioactive Compounds Of *Celastrus Paniculatus* For The Management Of Diabetes Mellitus

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Abstract

Molecular docking is one of significant approach for molecular research for discovering lead compounds in terms of targeting the specific enzymes and protein receptors for management of several disorders. *Celastrus paniculatus* belonging to the family of *Celeastraceae*, has been traditionally utilized since the ayurvedic system of medicine for the management of several disorders. Several studies indicated the presence of bioactive compounds such as phytosterols, sesquiterpene polyol ester (such as β-sitosterol, campesterol and stigmasterol), sesquiterpene alkaloids (like celapanigin, celapanin, and celapagin), and palmitic, linolenic acids, oleic, linoleic and stearic in seed extract of *Celastrus paniculatus*. Diabetes mellitus (DM) is chronic metabolic disorders affecting the people worldwide as well as impaired the normal life of different communities. Inhibition of α-amylase one of the target enzymes in terms of decreasing the absorption of glucose as well as delaying the release of level of glucose in blood stream and preventing the development of DM. In view of this, the aim of this study is to identify the active lead molecules of *Celastrus paniculatus* by targeting the α-amylase inhibition for management of DM. It was found that among the others bioactive compounds, beta sitosterol having the favorable docking score of -7.9 kcal/mol and binding energy of -40.43 kcal /mol with their hydrophobic interaction. Thus, the mechanism of action of the bioactive compounds of selected herb possessed the antidiabetic potential has been also highlighted on therapeutic potential of lead molecules for further research in terms of advancement and development of therapeutic approach towards the management of DM.

Keywords: Molecular docking, diabetes mellitus, bioactive compound, α-amylase, discovery

PIET-APSECON-03

Clove Oil As A Promising Natural Remedy For Diabetic Mellitus

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Abstract

Clove (Syzygium aromaticum) essential oil has gained attention as an adjunctive strategy for diabetes mellitus treatment in recent research. Predominantly composed of eugenol and related phenylpropanoids, the oil demonstrates strong antioxidant and anti-inflammatory properties that protect pancreatic β-cells, improve insulin secretion, and attenuate insulin resistance. Preclinical studies using streptozotocin and high-fat diet rodent models report consistent reductions in fasting glucose, improved lipid profiles, and decreased markers of oxidative stress after oral or topical administration of clove oil or purified eugenol. In vitro and in silico investigations further indicate that clove constituents inhibit carbohydrate-digesting enzymes (α-amylase and α-glucosidase) and modulate pathways linked to glucose homeostasis, such as NRF2, PI3K/Akt, and inflammatory NF-κB signalling. Encapsulation and formulation efforts have improved the stability and bioavailability of volatile compounds, addressing common delivery challenges for essential oils. Clinical evidence remains limited but encouraging: small human trials and dietary supplement studies suggest modest glycemic benefits and improved lipid parameters, though heterogeneity in preparations, doses, and endpoints complicates interpretation. Safety profiles are generally favourable at therapeutic doses, yet concerns about hepatotoxicity, mucosal irritation, and herb-drug interactions warrant cautious use alongside established antidiabetic medications. Overall, recent research positions clove essential oil and eugenol as biologically plausible adjuncts for diabetes care, meriting larger, well-designed clinical trials with standardized extracts to define efficacy, dosing, and long-term safety. Future studies should prioritize randomized controlled trials, pharmacokinetic profiling, and standardized manufacturing to translate preclinical promise into clinical recommendations, while monitoring adverse events and interactions in diverse diabetic populations and comorbid settings. Globally prioritized.

Keywords: Clove essential oil, Eugenol, Phenylpropanoids, Antioxidant activity

PIET-APSECON-04

Pharmacist As Clinical Translators: Optimizing Medication Therapy In Personalized Medicine

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Abstract

Personalized medicine represents a paradigm shift in healthcare by integrating genetic, clinical, and biochemical data to tailor therapeutic regimens for individual patients. Pharmacists play a pivotal role as clinical translators in this evolving model by bridging molecular insights with evidence-based pharmacotherapy. Their expertise in pharmacogenomics, therapeutic drug monitoring (TDM), and drug–gene interaction analysis enables the optimization of medication selection, dosing, and monitoring strategies. By interpreting genomic reports and correlating them with pharmacokinetic and pharmacodynamic variability, pharmacists can proactively identify risks such as adverse drug reactions, toxicity, or therapeutic failure.

In clinical settings, pharmacists collaborate with multidisciplinary teams to implement genotype-guided prescribing, especially for drugs with narrow therapeutic indices or known polymorphic metabolic pathways (e.g., CYP450 variants). Integration of clinical decision-support tools, electronic health records, and pharmacogenomics databases further strengthens the capacity of pharmacists to deliver precision-based recommendations. Additionally, pharmacist-led patient counselling enhances adherence, ensures informed decision-making, and facilitates real-time monitoring of therapeutic outcomes.

As precision medicine continues to mature, the expanding scope of pharmacists' responsibilities underscores their significance in translating bench side

scientific discoveries into bedside clinical solutions. Their involvement is essential to ensuring safe, effective, and individualized therapy, ultimately contributing to improved patient outcomes and reduced healthcare burden.

Keywords: Personalized medicine; Pharmacogenomics; Therapeutic drug monitoring; Clinical pharmacy; Precision therapeutics

PIET-APSECON-05

Pharmacist Role In Drug Formulation Development And Clinical Transition

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Abstract

Pharmacists play a central and multifaceted role in drug formulation development and the successful transition of new therapies into clinical use. In the formulation stage, pharmacists apply their expertise in pharmaceutics, biopharmaceutics, and material science to design dosage forms that ensure stability, bioavailability, and patient acceptability. They evaluate excipient compatibility, optimize drug-release characteristics, and perform preformulation studies to determine solubility, stability, and pharmacokinetic behavior. This scientific foundation enables the creation of safe, effective, and scalable formulations suitable for preclinical and clinical evaluation. During the clinical transition phase, pharmacists contribute significantly to bridging laboratory research with patient-centered outcomes. They participate in clinical trial protocol development, dose selection, and investigational product management. Their role includes ensuring proper storage, labeling, dispensing, and documentation of investigational drugs while maintaining strict regulatory compliance. Pharmacists also monitor adverse effects, assess drug–drug interactions, and provide essential insights for refining formulations based on early clinical findings.

In hospital or clinical settings, pharmacists support the adoption of newly developed formulations by educating healthcare teams, optimizing therapeutic regimens, and guiding patient use. Together, these responsibilities highlight the pharmacist's unique position in integrating scientific innovation with clinical application, ultimately accelerating drug development and enhancing patient care. By ensuring continuity between formulation design and therapeuse, pharmacists contribute significantly to improving medication quality, safety, and treatment outcomes.

Keywords: Pharmacist role; drug formulation development; clinical transition; preformulation studies; bioavailability; clinical trials; investigational drugs; regulatory compliance.

PIET-APSECON-06

Pharmacist Role In Public Health: Translating Research Into Community Interventions

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Abstract

Pharmacists play an increasingly vital role in public health by transforming scientific research into practical, community-focused interventions that improve population health outcomes. As accessible healthcare professionals, pharmacists apply evidence-based findings to design and implement programs targeting disease prevention, medication safety, and health promotion. Their involvement begins with interpreting public health research, such as studies related to epidemiology, therapeutic effectiveness, and behavioral health trends. Using this knowledge, pharmacists develop interventions including vaccination campaigns, smoking cessation programs, chronic disease management services, and rational use of medicines.

Pharmacists also contribute to reducing the burden of non-communicable diseases by offering screening services for hypertension, diabetes, dyslipidemia, and asthma. By monitoring therapy outcomes and promoting adherence, they ensure that research-based treatment guidelines are effectively translated into daily patient practice. Additionally, pharmacists support antimicrobial stewardship, helping communities combat antimicrobial resistance through education and responsible prescribing practices.

Through multidisciplinary collaboration with physicians, public health officials, and community organizations, pharmacists help integrate scientific advancements into sustainable interventions that elevate community well-being. By aligning research insights with practical healthcare delivery, pharmacists act as key facilitators in transforming public health knowledge into meaningful, real-world impact.

Keywords: Pharmacist; public health; community interventions; health promotion; evidence-based practice; disease prevention; medication adherence; antimicrobial stewardship.

PIET-APSECON-07

Nanomedicine In Wounds Healing

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Abstract:

Millions of people worldwide are impacted by chronic wounds' poor healing due to their high death rates and related expenses. Unfortunately, existing therapy techniques have limited clinical success since they are unable to address these fundamental problems. Innovative approaches that lower infection, moisturize the wound, activate the healing processes, hasten wound closure, and minimize scar formation are required for quicker recovery. Using the special benefits of nanomedicine in wound healing techniques has shown encouraging results during the last few years. The lack of an environment that promotes cell migration, proliferation, and angiogenesis, bacterial infection, and imbalanced and protracted inflammation are the three main issues associated with chronic wounds. Through antibacterial, anti-inflammatory, and angiogenetic actions, nanomedicine can stimulate a variety of cellular and molecular pathways involved in the wound microenvironment, potentially changing the wound microenvironment from nonhealing to healing. Modern materials, so-called "smart" biomaterials, and theranostic nanoparticles are just a few of the innovative ways that nanotechnology has been continuously transforming the treatment and management of wound care in recent years.

Keywords: Nanomedicine, angiogenesis, wound healing, microenvironment and smart biomaterials.

PIET-APSECON-08

Nipah Virus (Niv): An Overview

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Abstract:

As a zoonotic virus, the Nipah virus (NiV) can spread from animals to people. It is a member of the paramyxovirus family. This virus can infect humans through contaminated food or direct contact with infected animals, such as pigs and bats. Additionally, it can spread from person to person. Due of several recent outbreaks, especially in South and Southeast Asia, it is a matter for concern. The Nipah virus (NiV) first surfaced in Malaysia and Singapore in 1998–1999. Since then, it has resurfaced multiple times, causing severe infections and a high death rate. After infecting pigs, the virus transmitted to people. Direct contact or bodily fluids from animals are the main ways that NiV is spread. Human neurological and respiratory diseases are caused by the recently discovered zoonotic paramyxovirus known as Nipah Virus (NiV). The virus might take two weeks to two months to incubate in people. Severe NiV encephalitis frequently manifests as a high temperature, headache, nausea, vomiting, altered eye reflexes, vasomotor abnormalities, seizures, and myoclonic jerks, which are indicators of brainstem dysfunction. Serological, molecular, virological, and ELISA methods are among the many methods used to diagnose NiV infection. Antivirals and vaccinations that can help prevent and control future outbreak scenarios are being researched.

Keywords: Nipah, pigs and bats, Antivirals, Vaccination and zoonotic paramyxovirus.

PIET-APSECON-09

Niosomes: A Novel Drug Delivery System

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Abstract:

Immunization and the treatment of infectious diseases have undergone a radical change in recent years. Not only have many disease-specific biologicals been created, but their efficient delivery has also gained popularity. An developing class of new vesicular systems is characterized by niosomes. Niosomes are self-assembling vesicles predominantly composed of cholesterol and artificial surfactants. Niosomes were used as a medication carrier in a comprehensive study. Niosomes have shown promise as a medication carrier, with the potential to reduce drug side effects and boost therapeutic efficacy in a number of illnesses. A novel approach to liposomes, niosomes are a kind of non-ionic surfactant vesicles that are more stable, non-toxic, biodegradable, and less expensive. They may represent different vesicular systems from liposomes because of their comparable structure. Niosomes typically include a variety of medications. In order to generate a therapeutic impact in humans or animals at the site of disease while concurrently lowering the drug's concentration in surrounding tissues, pharmaceutical substances are administered at a predetermined rate. This technique is referred to as a Novel drug delivery system. The drug's localized action boosts its efficacy and lessens its systemic harmful effects on tissues.

Keywords: Novel, Biodegradable, Therapeutic efficacy, vesicles and surfactants.

PIET-APSECON-10

Design And Development of Novel Drug Delivery System

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Abstract

The design and development of novel drug delivery systems (NDDS) have become pivotal in addressing the limitations inherent to conventional therapeutic approaches, such as poor solubility, low bioavailability, non-specific distribution, and undesirable side effects. This research focuses on the formulation and optimization of advanced NDDS platforms aimed at improving drug solubilization, enhancing site-specific delivery, and achieving controlled, sustained release profiles. Leveraging emerging materials science, a variety of nanocarrier platforms—including polymeric nanoparticles, liposomes, and mesoporous silica frameworks—were engineered for the encapsulation and delivery of both hydrophilic and hydrophobic drugs. Comprehensive physicochemical characterization was conducted employing dynamic light scattering, transmission electron microscopy, and FTIR analysis to ensure system stability, particle uniformity, and successful drug encapsulation. In vitro drug release studies revealed favorable kinetics, demonstrating the ability to modulate drug release in response to environmental stimuli, thereby minimizing premature drug leakage and maximizing on-target therapeutic effects. Cellular uptake assays and cytotoxicity studies validated the biocompatibility and superior therapeutic benefits of the formulations compared to conventional dosage forms. Furthermore, in vivo pharmacokinetic and biodistribution analyses exhibited enhanced bioavailability and targeted tissue accumulation, affirming the translational promise of the developed systems. The integration of smart, stimuli-responsive elements further demonstrated opportunities for personalized and on-demand therapy. This work underscores the critical role of rational material selection and formulation design in overcoming clinical challenges, ultimately contributing to the advancement of next-generation drug delivery platforms and improving patient care outcomes in pharmaceutical sciences

Keywords: Novel drug delivery system (NDSS), Formulation design, Nanocarriers, Targeted Release

PIET-APSECON-11

Formulation Of A Dha-Enriched Flexseed Oil Nanoemulsion Gel To Potentiate The Anti-Dermatitis Action Of Clobetasol Propionate

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Abstract

Aim of the present study was to investigate the potential of Nano emulsion formulation for topical delivery of Clobetasol propionate (CP) using Flaxseed oil oil (containing omega-3 fatty acids) as the oil phase. CP has anti-inflammatory, immunomodulatory and antiproliferative activities. However, its clinical use is restricted to some extent due to its poor permeability across the skin. Algal oil was used as the oil phase and was also exploited for its anti-inflammatory effect along with CP in the treatment of inflammation associated with dermatitis. Nanoemulsion formulations were prepared by aqueous phase titration method, using algal oil, tween 40, PEG 200 and water as the oil phase, surfactant, co-surfactant and aqueous phase respectively. Furthermore, different formulations were subjected to evaluate for ex-vivo permeation and in-vivo anti-inflammatory, irritation and contact dermatitis studies. The optimized Nano emulsion was converted into hydrogel-thickened Nano emulsion system (HTN) using carbopol 934 and had a viscosity of 91.37 ± 0.02PaS. The optimized formulation had small average diameter (135 nm) with zeta potential of -36.01 mV which indicated good long-term stability. In-vivo anti-inflammatory activity indicated 83.59% and 45.34% inhibition of inflammation for drug loaded and placebo formulations respectively. The assessment of skin permeation was done by DSC and histopathology studies which indicated changes in the structure of epidermal membrane of skin. Contact dermatitis reveals that the higher NTPDase activity in the treatment with the CP-loaded nanoemulsion could be related to the higher anti-inflammatory effect in comparison with placebo nanoemulsion gel.

Keywords: *Flexseed Oil; Anti-Inflammatory Study; Clobetasol Propionate; Contact Dermatitis; Nanoemulsion.*

PIET-APSECON-12

Influence of Combined Natural Superdisintegrants on the Formulation of Fast-Dissolving Lisinopril Tablets

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Abstract

The demand for fast dissolving tablets has been growing during the last decade especially for the geriatric and paediatric patients. The main objective of this study was to formulate and evaluate the fast dissolving tablets of Lisinopril using natural superdisintegrants in combinations. Various formulations were prepared by direct compression using different combinations of natural superdisintegrant i.e. isolated mucilage of Flex seed seed, isolated mucilage of Fenugreek seed and extracted mucilage of Hibiscus rosasinesis to achieve optimum release profile, disintegration time and hardness. Microcrystalline cellulose was used as diluent and mannitol as bulking agent. The initial compatibility studies between the drug and excipients were carried out using FTIR spectroscopy. The tablets were evaluated for weight variation, hardness, friability, in-vitro disintegration time and drug release characteristics. Hardness indicated good mechanical strength around 4.0-4.5 kg/cm2 for all the batches. The results of in-vitro disintegration time indicated that the tablets dispersed rapidly in mouth within 45 secs. It was concluded that superdisintegrants addition technique is a useful method for preparing orally disintegrating tablets by direct compression method.

Key words: *Fast Dissolving Tablet, Isolated Mucilage Of Flexseed Seed, Isolated Mucilage Of Feeenugreek Seed And Mucilage Of Hibiscus Rosasinesis*

PIET-APSECON-13

A Review On Green-Synthesized Silver Nanoparticles

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Abstract

Green synthesis of silver nanoparticles (AgNPs) has gained significant attention as an eco-friendly and sustainable alternative to conventional chemical and physical methods. Utilizing plant extracts, microorganisms, or natural polymers as reducing and stabilizing agents, this approach minimizes toxic by-products and reduces energy consumption. Phytochemicals such as flavonoids, terpenoids, and phenolics facilitate efficient nanoparticle formation while enhancing stability. Green-synthesized AgNPs exhibit notable antimicrobial, antioxidant, and catalytic properties, making them valuable for biomedical applications, environmental remediation, and industrial processes. However, challenges such as variability in biological materials, limited control over particle size and morphology, and scalability issues remain. Continued research is needed to optimize synthesis conditions, establish standardization protocols, and fully exploit the potential of green-derived AgNPs in sustainable nanotechnology.

Keywords: Green synthesis, nanoparticles, antimicrobial, antioxidant, nanotechnology etc.

PIET-APSECON-14

Impact Of Bioinformatics In Drug Discovery

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Abstract

Background and objectives- Drug discovery is a multistep process that is complex, has high risk and is time-consuming. With the help of this process, new drugs are discovered. Bioinformatics is an interdisciplinary field of science that develops methods and software tools for understanding biological data, especially when the data sets are large and complex. Bioinformatics helps in effective drug discovery in a short period.

Methods- various bioinformatics tools for drug designing are auto dock, lig plot, flex x, and grid. Steps in drug designing include target identification, target validation, compound screening, drug optimization, preclinical trials, and clinical trials. Target identification means the identification of the molecular target of the drug. Genomic and proteomic data provide valuable information. Target validation leads to a strong association between the identified target and the disease of interest. The next step is compound screening which involves the identification of candidate compounds that can be helpful in drug development. Drug optimization involves the selection of the most appropriate drug. Then preclinical and clinical trials are done. After getting approval drug is finally launched in the market. Results and conclusions- with the help of bioinformatics drug discovery can be done within short period of time. This also helps in cutting down the expenses.

Keywords: drug discovery, bioinformatics, target, compound, trial, optimization

PIET-APSECON-15

Synthesis, Characterization And Antimicrobial Evaluation Of Novel 2,4-Disubstituted Thiazole Derivatives

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Abstract

Thiazoles comes under the category of heterocyclic compounds and in five-membered rings, it contains sulphur and nitrogen at position 1 & 3 respectively. In this study, a series of heterocyclic compounds containing 2,4-disubstituted thiazole derivatives has been synthesized and screened for antimicrobial activity. All the synthesized compounds were unambiguously identified based on their spectral analysis such as FTIR, 1H-NMR, 13C-NMR and mass spectroscopy. All the produced compounds were evaluated for their in-vitro antimicrobial activity such antibacterial and antifungal. According to results, the majority of the compounds were more active against bacteria than fungi. Among gram-positive Staphylococcus aureus, gram-negative bacteria Escherichia coli and a fungi Candida albicans were the most sensitive strains. Several compounds were shown to have major activity against gram-positive bacteria, and most of them were also found to have potential activity against gram-negative bacteria. Few of the tested analogues showed significant antifungal action. Few candidates were discovered to have both antibacterial and antifungal activity, indicating a broad spectrum of antibacterial action. These interesting possibilities can be used to further structurally modify molecules with higher activity profiles.

Keywords: Thiazole, Heterocyclic, Antimicrobial activity, Nuclear-magnetic resonance

PIET-APSECON-16

Phytosomes: A Novel Nano Carrier For The Management Of Dermatological Disorders

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Abstract

The term "Phyto" refers to plants and can also be used to describe something resembling a cell. Phytosomes are created to form individual cells that shield the active element of herbal extracts from degradation by digestive secretions and natural bacterial processes. Phytosomes are a technology that modifies drugs to enhance their absorption and bioavailability. This is achieved by combining herbal phytoconstituents or plant extracts with phospholipids to create a complex called phytosomes, which can easily interact with lipids. Phytosomes, similar to liposomes, primarily function by creating a strong chemical connection to create a complex using plant extracts or phosphatidylcholine components. The natural plant extracts provide significant therapeutic value due to their capacity to enhance the bioavailability of drugs to tissues. Phytosomes are classified as an innovative approach for delivering herbal drugs. The addition of phytosomes to the gel formulation improves stability and increases the amount of the substance that remains on the skin. Therefore, phytosomes were created through the process of combining phosphatidylcholine with plant extracts. Phospholipids have a molecular structure that consists of two fat soluble tails and a water-soluble head. Due to their ability to dissolve in both fat and water, they are more easily absorbed and have been utilised in the treatment of skin carcinomas, antiaging, and skin diseases.

Keywords: Phytosome, gels, herbal, nano-formulation

PIET-APSECON-17

Current Challenges In Cancer Treatment

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Abstract

Background & Objective: Cancer is a major public health problem worldwide. Global demographic characteristics predict an increasing cancer incidence in the next decades, with >20 million new cancer cases annually expected by 2025. In this review, we highlight the current concepts and discuss some of the current challenges and future prospects in cancer therapy.

Methodology: We conducted a non-systematic PubMed search, selecting the most comprehensive and relevant research articles, clinical trials, translational papers, and review articles on precision oncology and immuno-oncology. Papers were prioritized and selected based on their originality and potential clinical applicability.

Conclusion: Despite major advances, the current approach to face cancer treatment is still reductionist. Targeting single molecular abnormalities or cancer pathways has achieved good clinical responses that have modestly affected survival in some cancers. However, targeting a single hallmark or pathway with a single drug ("magic bullet") will not likely lead to cancer cure. We predict that drug combinations against several molecular alterations or cancer hallmarks, in a way that is similar to what we have done with HIV treatment, might be a promising therapeutic strategy to treat cancer in the near future.

Keywords: Cancer; Clinical trials; Oncology

PIET-APSECON-18

Stability Indicating Rp-Hplc Method For Simultaneous Estimation Of Selected Drugs And Their Fixed Dose Combinations

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Abstract

Method validation is a critical component of analytical chemistry that confirms the method employed for a specific test is suitable for its intended use. This process is fundamental for any data package submitted to regulatory agencies in support of new product marketing or clinical trial applications. Currently, there is no single source or final guideline on analytical method validation that helps analysts to perform validation in a systematic manner. Therefore, industry depends on the analyst's knowledge and experience to develop simple and efficient methods of analysis. High performance liquid chromatography is an analytical technique which is efficient to separate, detect and quantify various drugs and its related degradants. It is also employed to separate manufactured drugs from drug related impurities, to detect and quantify synthesized drug and to reduce other impurities at the time of separation. The present work focuses on validating an analytical method with ICH Q2(R2) and Q14 guidelines. Overall, the validated method proved reliable, sensitive, and compliant with regulatory requirement, making it suitable for routine analysis in pharmaceutical quality control and regulatory submission.

Keywords: Validation; Analytical method development; HPLC, Quality control, ICH guidelines

PIET-APSECON-19

Novel Drug Delivery System Used In Therapies Of Cancer

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Abstract

Background: Targeted drug delivery systems are designed to deliver therapeutic agents (such as drugs or biologics) specifically to the site of action within the body, such as a diseased tissue or cell type, while minimizing exposure to healthy tissues. These systems aim to enhance the efficacy of treatment and reduce side effects associated with conventional drug administration methods.

Methodology: A comprehensive systematic literature search was carried out using Scopus, Science Direct and Google scholar. Discussion: With improved drug solubility, precise cancer cell targeting, and controlled drug release, novel drug delivery systems have grown into a more effective choice. Targeted medication delivery has the potential to increase therapeutic efficacy by decreasing off-target effects and increasing drug accumulation at tumour locations.

Conclusion: With the potential to revolutionize cancer therapy by increasing its efficacy while reducing harmful effects on healthy tissues, tailored medication delivery has immense potential. Research endeavours in the sector are progressing despite current obstacles, enabling the creation of novel targeted drug delivery systems that yield better clinical results.

Keywords: Novel Drug Delivery System, conventional drug, cancer therapy, Targeted medication delivery

PIET-APSECON-20

Tablet-In- Capsule

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Abstract

The revolutionary tablet-in-capsule technology, a novel approach transforming oral drug delivery systems. Oral administration remains the most favoured method for therapeutic agents, encompassing a range of pharmaceutical dosage forms such as tablets, capsules, suspensions, and solutions. Solid dosage forms, particularly tablets, stand out as the preferred class of products, widely embraced by pharmaceutical manufacturers, physicians, and patients alike. Capsules, defined as solid dosage forms encapsulating drugs within gelatin shells, serve as versatile containers for both powder and non-powder fillings, including tablets and pellets. The past few decades have witnessed significant advancements in drug delivery systems, setting the stage for the emergence of tablet-in-capsule technology. Tablet in capsule represents a multifunctional and multiple unit system, featuring versatile mini-tablets enclosed in a hard-gelatin capsule. The formulation of this system offers tremendous flexibility, allowing for tailored solutions to specific therapeutic needs. Mini-tablets, a novel trend in solid dosage form design, aim to overcome therapeutic obstacles by providing benefits such as dose flexibility and combined release patterns. This poster explores the key aspects of this technology, including formulation possibilities, manufacturing processes and general evaluation tests.

Keywords: Capsule, Mini-tablet, Oral drug delivery, Solid dosage form, Tablet-in-capsule

PIET-APSECON-21

Drug Development Through the Ages: A Shift from Botanical Origins to Technological Innovation

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Abstract:

Nature has historically served as primary source of therapeutic agents. Early healing practices relied on herbs, plant extracts, and natural remedies for treating diseases. Traditional medicine is the old system of healing that has been used for hundreds of years by different cultures around the world. Traditional medicine systems such as Ayurveda, Chinese Medicine, and Unani system have utilized herbs, roots, minerals, and animal-derived products for centuries. Over time, modern science discovered that many of these natural substances can be very useful for developing new medicines, especially for treating infections and cancer. Later, scientists started separating the active chemicals from these natural sources like salicylic acid taken from willow bark, which later become aspirin. However, after the 1990s, pharmaceutical companies reduced their focus on natural product research. This happen because natural substances are often difficult to collect, separate, identify and improve. The process takes time, money and lot of effort. In the mid-20th century, synthetic chemistry became popular. Scientists started making medicines in the laboratory and testing 1000 of artificial compound. With this new era comes new possibilities, not least the novel target that have emerged in recent times and the develop of state-of-the-art technologies that can be applied to drug discovery from natural sources. Although progress has been made with some immunomodulating drugs. In conclusion, the shift from herbal remedies to high-tech medicines shows how traditional knowledge and modern science together drive future drug discovery, leading to safer and more effective therapies. Eg: The pacific yew tree inspired the modern anticancer drug paclitaxel.

Keywords: herbs, Chinese medicine, Unani, traditional, drug discovery.

PIET-APSECON-22

AI: Shaping the Future of Heart Failure Detection

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Abstract

Congestive heart failure (CHF) is marked by the heart's diminished capacity to pump blood effectively. The disease has no cure yet; current treatments aim to manage symptoms, but often become less effective over time. CHF stands as one of the most common and impactful cardiovascular disorders worldwide. Traditional diagnostic methods rely heavily on clinical observation and subjective judgment, frequently leading to delayed or missed diagnosis. The rise of artificial intelligence (AI) technologies brings new opportunities for precision diagnosis and personalized care in CHF management. AI-driven approaches show substantial promise for transforming CHF diagnosis and treatment patterns. The use of multiple data sources and advanced machine learning enables more accurate early detection, better monitoring, and improved therapeutic interventions. AI-based systems such as Qure.ai's qXR can analyze medical imaging, ECG signals, and continuous data from wearables, as well as extract meaningful insights from clinical notes. These fields are where AI is making significant strides. Future research should prioritize large-scale clinical validation and robust implementation frameworks to integrate these technologies into everyday healthcare practice.

Keywords: Congestive heart failure (CHF), Artificial intelligence (AI), Precision diagnosis, Personalized care, Machine learning (ML), Multi-source data integration

PIET-APSECON-23

Antifungal Agents From Ancient History With Novel Approaches Of Delievery

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Abstract

Fungal infections kill more than 3 million people every year. The currently used antifungal drugs are limited and often accompanied by high toxicity to patients, elevated treatment costs, increased frequency of resistance rates, and the emergence of naturally resistant species. These treatment challenges highlight the urgency of developing new antifungal therapies from plant sources, which could positively impact millions of lives each year globally. Currently, antifungal options are limited and associated with high toxicity, increasing resistance, and substantial costs, representing a significant burden on public health systems. Variety of plants possesses anti-fungal activity like tea tree, garlic, turmeric, oregano, neem, aloe vera etc. The antifungal properties of plant products and other natural solutions have been recognized since ancient times and are used in antifungal ointments. Among the different types of plant products, essential oils are considered one of the most promising natural products and dominate because of their complex composition of active substances and mild nature, such as garlic oil, orange peel liquid, and tea tree oil. People have used broken sections of garlic, or various concoctions of essential oils of plants applied to the affected area affected by fungal infections, to significantly inhibit fungal growth and reduce or even eliminate symptoms. It is worth mentioning that some herbs are refined into ointments by being ground and applied to the affected area, which also show good antifungal effects.

Keyword: Fungal infections, Antifungal resistance, Medicinal plants, Plant-based antifungals, Public health burden

PIET-APSECON-24

Ai Tools And Diagnosis Of Parkinson's Disease: A Hope For Early Detection Of Disease

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Abstract

Parkinson's disease (PD) is associated with aggregation of protein alpha synuclein and selective death of dopaminergic neurons, thereby leading to cognitive and motor impairment in patients. The disease has no complete cure yet; the current therapeutic strategies involve prescription of dopamine agonist drugs which turn ineffective after prolonged use. Parkinson's illness has been proclaimed as the second most neurodegenerative problem on the planet. Traditional diagnostic approaches rely heavily on clinical observation and subjective assessment, often leading to delayed or inaccurate diagnoses. The emergence of artificial intelligence (AI) technologies offers unprecedented opportunities for precision diagnosis and personalized treatment strategies in PD management. AI-driven approaches demonstrate substantial potential for revolutionizing PD diagnosis and treatment personalization. The advent of artificial intelligence and machine learning technologies has opened new frontiers in neurological disease diagnosis and management. The integration of multiple data modalities and advanced machine learning algorithms enables earlier detection, more accurate monitoring, and optimized therapeutic interventions. Neuroimaging-based approaches, Voice and speech analysis, gait and movement analysis are some of the fields where AI is performing an excellent work. Future research should focus on large-scale clinical validation and implementation frameworks for healthcare systems.

Keyword: Parkinson's disease (PD), Alpha-synuclein aggregation,Artificial intelligence (AI), Machine learning (ML)

PIET-APSECON-25

Bioactive Compounds From Herbs Used In The Treatment Of Dyslipidemia

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Abstract

Dyslipidemia is a key risk factor for cardiovascular diseases, which are a major cause of morbidity and mortality worldwide. However, despite the advancement of the treatment and prevention of dyslipidemia, medications used to treat dyslipidemia are limited to chemical drugs. Herbal medicine, as an alternative treatment, has a long history of usage and provides more treatment options, and related studies have revealed intervention targets for dyslipidemia. Herbal medicine has been used as an alternative medicine worldwide. Several rigorous clinical trials have illustrated that the bioactive compounds from herbal medicines are effective and safe to improve the lipid profile. The bioactive components of herbal medicine could regulate the process of lipid metabolism and multi-target intervention, which occur in cholesterol absorption, cholesterol synthesis, transport and excretion. Additionally, among these processes, transcription factors play an important role in these mechanistic studies of herbal medicines to lower lipid values. The bioactive compounds from herbal medicines are mostly safe and very well tolerated. Overall, the bioactive components from herbal medicines can modulate different metabolic pathways and regulate plasma lipid levels with different mechanisms of action.

Keyword: Dyslipidemia, Herbal medicine, Bioactive compounds, Clinical trials, Herbal therapeutics

PIET-APSECON-26

Robotics in Healthcare

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Abstract:

Robotics has significantly transformed the healthcare industry by offering solutions to pressing issues including aging populations, limited access to specialized treatment, and growing demands for precision and safety.

This comprehensive study examines the advancement, application, and future prospects of robotics in healthcare across a quantity of fields.

The study looks at a variety of healthcare robot types, such as telepresence, interventional, surgical, assistive, socially-assistive, and rehabilitative systems, and assesses how they impact clinical outcomes, cost-effectiveness, and care quality. The incorporation of cutting-edge technology—such as computer vision, haptic feedback, machine learning, and artificial intelligence—into modern robotic systems is examined, with a focus on how these technologies enhance robot flexibility and capability.

Keywords: Robotics, rehabilitative system, haptic feedback and artificial intelligence

PIET-APSECON-27

Impact of Free Radicals on Health

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Abstract

The topic of free radical chemistry has received a lot of attention in recent years. Our bodies produce free radicals, reactive oxygen species, and reactive nitrogen species through a variety of endogenous systems, exposure to diverse physiochemical situations, or pathological states. For healthy physiological function, free radicals and antioxidants must be in equilibrium. Oxidative stress results when the body's capacity to control free radicals is exceeded. Thus, free radicals damage DNA, lipids, and proteins and cause a variety of illnesses in humans. Therefore, applying antioxidants from outside sources can help manage this oxidative damage. Thus, in recent years, there has been a greater focus on finding natural chemicals with antioxidative activity that are both effective and safe.

Keywords: Free radicals, antioxidants, DNA, Oxidative stress etc.

PIET-APSECON-28

Synthesis & Molecular docking studies of Novel azobenzene induced 5-oxoimidazoline Derivatives as Potent Anti-Microbial Agents

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Abstract:

Imidazoline is often a heterogeneous 5-membered ring structure with two nitrogen atoms. The heterocyclic compounds with an imidazoline moiety are a promising scaffold for investigating medicinal potential. The imidazoline nucleus with an oxo group at the 5th, 2nd & 4th position exhibits a wide spectrum of antibacterial and antifungal activity. Oxo-imidazoline derivatives are a fascinating class of chemicals that have attracted a lot of research recently because of their numerous biological actions. This article focused on exploring the **azobenzene-induced 5-oxoimidazoline moiety,** which represents a promising structural framework for the design and development of a new class of antimicrobial agents. This work describes the **stepwise synthesis and spectroscopic characterization** of a series of novel azobenzene induced 5-oxoimidazoline derivatives, began with the **diazotization of substituted anilines,** followed by coupling with **methyl paraben** to yield the corresponding azo compounds, which were subsequently refluxed with **hydrazine hydrate** to afford the hydrazide intermediate. Reaction of hydrazide compounds with **substituted acetophenones** and **aldehydes** produced **diazenyl Schiff bases** which upon refluxing with **amino acids (glycine and alanine)** furnished the desired final compounds **of oxo-imidazoline derivatives.** Additionally, **molecular docking studies** were carried out against three protein targets: bacterial DNA gyrase from *S. aureus* (PDB ID: 2XCT) and *P. aeruginosa* (PDB ID: 6M1S), and the fungal enzyme 14α-demethylase from *C. albicans* (PDB ID: 3LD6) to investigate ligand–protein interactions and to predict the most probable binding conformations. The promising compounds in the series with best anti-microbial activity, suggesting their potential as **lead molecules for further *in- vitro & in-vivo* validation and optimization** in the development of novel antimicrobial agents.**Keywords:** Oxo imidazoline, azobenzene, diazotization, antimicrobial, molecular docking

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PIET-APSECON-29

Advances And Application Of Novel Drug Delivery System (Ndds) In Cancer Treatment

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Abstract

Cancer treatment continues to face major challenges, including non-specific drug distribution, systemic toxicity, multidrug resistance, and poor bioavailability of many chemotherapeutic agents. Novel drug delivery systems (NDDS) offer promising solutions by enabling targeted, controlled, and efficient delivery of anticancer drugs. NDDS is designed to improve therapeutic outcomes while reducing adverse effects in cancer patients.

Nanocarrier-based approaches— such as liposomes, polymeric nanoparticles, dendrimers, and solid lipid nanoparticles— have demonstrated significant potential in enhancing tumor selectivity through passive (EPR effect) and active targeting strategies. These systems improve drug solubility, protect agents from premature degradation, and allow for sustained or stimuli-responsive release within the tumor microenvironment. Liposomal formulations have already shown clinical success by reducing toxicity and improving pharmacokinetics, while polymeric nanoparticles enable co-delivery of multiple drugs to overcome resistance pathways.

Emerging platforms, including exosomes, nanogels, and antibody– drug conjugates (ADCs), further advance precision medicine by leveraging biological compatibility, receptor-specific binding, and intracellular delivery mechanisms. Additionally, stimuli-responsive systems triggered by pH, redox gradients, enzymes, or external stimuli (light, heat, magnetic fields) provide spatiotemporal control of drug release, minimizing damage to healthy tissues.

Despite these advancements, challenges such as large-scale manufacturing, stability, and regulatory pathways remain. Continued interdisciplinary research and clinical validation are essential for translating these systems into widely accessible cancer therapies.

Overall, NDDS represent a transformative approach to cancer treatment, offering the potential for improved efficacy, reduced toxicity, and personalized therapeutic strategies. This poster summarizes key innovations, current limitations, and future perspectives in the development of novel drug delivery systems for cancer therapy.

Keywords: Targeted drug delivery, Multidrug resistance (MDR), Polymeric nanoparticles, Tumor microenvironment

PIET-APSECON-30

Role Of Flavonoids In Skin Disease

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Abstract

Flavonoids are a wide variety of naturally-occurring polyphenolic compounds found in plants that are vital in the treatment of numerous skin conditions because of their potent antioxidant, anti-inflammatory, antimicrobial, and photoprotective properties. They reduce oxidative stress that causes premature skin aging, hyperpigmentation, eczema, psoriasis and acne by neutralizing reactive oxygen species. They also modulate major inflammatory pathways, such as NF-κB and MAPK, which in turn suppresses pro-inflammatory mediators and encourages the skin barrier to repair itself. Flavonoids demonstrate antimicrobial properties (e.g. quercetin, catechins and luteolin), inhibiting the growth of bacteria and viruses, promoting healing of wounds, and preventing complicated infections. Flavonoids also enhance collagen synthesis and regulate matrix metalloproteinases which leads to tissue regeneration with a reduction of scarring. Lastly, flavonoids are photoprotective, meaning they absorb UV light and prevent DNA damage caused from UV exposure, making them valuable in topical sunscreens and anti-photoaging products. Currently, topical and oral therapies of flavonoids are promising alternatives to current dermatological therapies and show to be safe and effective. Flavonoids do exhibit low bioavailability, demonstrating a strong case for utilizing advanced delivery methods such as nano-formulations. In conclusion, flavonoids serve as a natural and promising option for improvement of skin health and treatment of numerous dermatological conditions.

Keywords: Flavanoids, Skin diseases, anti-microbial, anti-inflammatory, oxidative stress, dermatology, photoprotection

PIET-APSECON-31

Antidiabetic Potential Of *Psidium Guajava* (Guava) Leaf And Fruit Extracts Incorporated Into Honey-Based Chewing Gum: A Novel Strategy To Improve Patient Compliance

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Abstract

Diabetes mellitus is a chronic metabolic disorder characterized by elevated blood glucose levels, representing one of the leading causes of morbidity and mortality worldwide. The early detection and management of diabetes are essential to control diabetes and prevent the progression of this disease. Natural remedies have attracted attention for their potential role in the treatment of diabetes. Guava (*Psidium guajava*), a member of the Myrtaceae family, has long been used in traditional medicine due to its significant antidiabetic activity. Both guava leaves and fruits contain bioactive compounds such as flavonoids, terpenoids, and phenolic acids, which have shown inhibitory effects on carbohydrate-digesting enzymes. Similarly, honey has also demonstrated antidiabetic potential. Studies have shown that honey inhibits pancreatic α-amylase and α-glucosidase, thereby delaying starch breakdown and moderating postprandial glucose levels. Additionally, honey provides antioxidant and anti-inflammatory effects, further contributing to glycemic control. Thus, the combination of guava extracts and honey in a chewing gum formulation offers a novel, natural, and patient-compliant strategy for diabetes management. Chewing gum as a drug delivery system ensures improved compliance, bypasses enzymatic degradation of insulin in the gastrointestinal tract, and provides added cognitive and oral health benefits.

Keywords: Diabetes mellitus, *Psidium guajava*, honey, flavonoids, postprandial glucose levels, pancreatic α-amylase and α-glucosidase.

PIET-APSECON-32

Advances in Novel Drug Delivery Systems: A Paradigm Shift Toward Precision Therapeutic

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Abstract

Novel drug delivery systems (NDDS) have emerged as transformative tools in modern therapeutics, enabling enhanced efficacy, targeted action, and improved patient compliance. This poster presents a comprehensive overview of recent advancements in NDDS, highlighting innovative strategies that overcome the limitations of conventional drug delivery. Key approaches include nanocarriers, lipid-based systems, polymeric delivery platforms, and stimuli-responsive technologies that allow controlled and site-specific release.

Nanoparticles, liposomes, and niosomes have shown exceptional potential by enhancing solubility, stability, and bioavailability of drug molecules. Polymeric systems—such as hydrogels, dendrimers, and biodegradable microspheres—offer customizable release profiles, enabling sustained or pulsatile delivery tailored to therapeutic needs. Additionally, targeted delivery systems utilizing ligands, antibodies, and receptor-based mechanisms significantly reduce off-target effects and improve therapeutic index. Emerging trends such as 3D-printed drug delivery devices, cell-mediated delivery, and smart materials responsive to pH, temperature, or enzymes further expand the scope of personalized medicine.

This poster also discusses challenges in NDDS translation, including scalability, regulatory constraints, and long-term safety evaluation. Despite these hurdles, continuous research and technological innovation are paving the way for next-generation drug delivery platforms with higher precision, reduced toxicity, and enhanced patient outcomes.

Overall, the evolution of NDDS signifies a major advancement in pharmaceutical science, offering promising opportunities for improved therapy across diverse clinical conditions.

Keywords: Novel Drug Delivery System, Nanocarriers, Liposomes, Polymeric Systems, Targeted Delivery, Controlled Release, Smart Materials, 3D-Printed Drug Delivery, Personalized Medicine, Therapeutic Efficacy.

PIET-APSECON-33

Nanocarrier - Based Delivery of Phytoconstituent for Improved Bioavailability

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Abstract

Phytoconstituents derived from medicinal plants exhibit a wide range of pharmacological activities, including antioxidant, anti-inflammatory, antimicrobial, and anticancer effects. However, their clinical translation is often restricted by poor bioavailability resulting from low aqueous solubility, instability in the gastrointestinal environment, rapid metabolism, and limited membrane permeability. Nanocarrier-based delivery systems have emerged as an effective strategy to overcome these biopharmaceutical challenges and enhance the therapeutic potential of plant-derived compounds.

Nanocarriers such as polymeric nanoparticles, liposomes, nano emulsions solid lipid nanoparticles, nanostructured lipid carriers, and micelles offer multiple advantages in phytoconstituent delivery. These systems can encapsulate both hydrophilic and lipophilic compounds, protect them from degradation, enhance solubility, improve pharmacokinetics, and enable site-specific or controlled drug release. Additionally, nanocarriers can increase intestinal absorption, extend circulation time, and reduce dose-related toxicity, thereby improving overall therapeutic efficacy. This poster explores the principles underlying nanocarrier-based delivery and examines recent advancements in the nano formulation of key phytoconstituents such as curcumin, quercetin, resveratrol, and berberine. It highlights how nanocarriers modulate physicochemical properties, facilitate targeted delivery, and overcome biological barriers. Case studies and comparative analyses demonstrate significant improvements in bioavailability and biological activity when these compounds are incorporated into nanocarrier systems. Overall, nanocarrier-based delivery represents a promising and versatile platform for maximizing the medicinal value of phytoconstituents. By improving stability, absorption, and therapeutic efficiency, nanotechnology provides a path toward developing more effective, safer, and clinically viable phytomedicine

Keywords: Nanocarriers, Phytoconstituents, Bioavailability, Nano formulation, Liposomes, Polymeric Nanoparticles, Solid Lipid Nanoparticles, Drug Delivery Systems.

PIET-APSECON-34

Safe Guarding Health: The Role of Pharmacovigilance in Patient Safety

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Abstract

Pharmacovigilance plays a major role in ensuring public health and safety. It improves patient care and safety in relation to the use of medicines. It contributes to the assessment of benefit, risk, effectiveness of medicines and ensures the correct, more effective, safe and rational use of medicines. Understanding, education and clinical training are provided under pharmacovigilance system. It also provides and promotes effective communication with the public. Pharmacovigilance, which is like a parasol to define the procedures for monitoring and analysing adverse drug reactions (ADRs), is a crucial part of efficient clinical practise, public health initiatives, and drug control systems. Reporting adverse drug reaction caused by a marketed drug is the prime responsibility of healthcare professionals with respect to public health and improving safety, not only healthcare professionals but also all the citizen of India should be aware to adverse drug reaction and its reporting. With the increasing complexity of therapeutic agents and widespread global drug use, robust pharmacovigilance systems are essential to protect public health. Modern approaches incorporate real-world evidence, electronic health records, big-data analytics, and patient-reported outcomes to improve the early identification of safety signals. Regulatory authorities, healthcare professionals, pharmaceutical companies, and patients collaborate to maintain comprehensive drug-safety surveillance. Strengthening pharmacovigilance practices; especially in low and middle income setting which enhances medication safety, promotes rational drug use, and supports informed regulatory decision-making. In this overview, we'll talk about medication safety, patient safety and pharmacovigilance.

Keywords: Patient safety, Pharmacovigilance, Adverse drug reactions.

PIET-APSECON-35

Engineered Cancer Nanovaccines: A New Frontier In Cancer Immunity

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Abstract

Vaccinations are essential for preventing disease. Vaccines can prompt the immune system to generate antibodies and activate various immune cells, leading to a response against tumor tissues and reducing the negative effects and recurrence risks of traditional chemotherapy and surgery. Cancer therapeutic vaccines, either alone or in combination with other immunotherapy's such as adoptive cell therapy or immune checkpoint blockade therapy, are an attractive class of cancer immunotherapeutic. This has transformed the landscape of oncological treatment by employing various strategies to teach the immune system to eliminate tumors. Cancer nanovaccines are an emerging strategy. Cancer nanovaccines function by encapsulating tumor-specific antigens or tumor-associated antigens within nonamaterials. The small size of these nonamaterials allows for precise targeting of t cells, dendritic cells, or cancer cells, thereby eliciting a more potent anti-tumor response. The properties of nonmaterial's play an essential role in collecting, maturation, and activation of the immune system. Cancer vaccines based on nonmaterial's can be specifically delivered to target tissues and cells through nanocarriers and nanoplatforms, thereby improving efficacy, extending the duration of antitumor immunity, and minimizing side effects. The diversity of strategies adopted for the design of nanovaccines , includes the types of active agents, nanocarriers, their fictionalizations, and the incorporation of adjuvant. Nanomedicines offer unique opportunities to improve the efficacy of these vaccines. A variety of nanoplatforms have been investigated to deliver molecular or cellular or sub-cellular vaccines to target lymphoid tissues and cells, thereby promoting the potency and durability of anti-tumor immunity while reducing adverse side effects. Newly emerging types of nanovaccines, are based on stimulation of interferon genes agonists, cancer neoantigens, mRNA vaccines, as well as artificial antigen-presenting cells.

Keywords: Nanovaccine, Cancer Immunotherapy, Co-Delivery, Nanocarriers, Nanomedicine

PIET-APSECON-36

AI-Enabled Predictive Quality Control: Transforming the Future of Pharmaceutical Manufacturing

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Abstract

The pharmaceutical industry is undergoing a rapid digital transformation, with Artificial Intelligence (AI) emerging as a powerful enabler of predictive, data-driven quality control. This poster presents an overview of AI-based predictive quality control systems that redefine manufacturing efficiency, accuracy, and regulatory compliance. By integrating machine learning algorithms, real-time analytics, and process automation, AI facilitates early detection of deviations, minimizes batch failures, and enhances overall process robustness. AI-enabled systems analyze vast datasets generated from sensors, PAT tools, and manufacturing equipment to identify patterns and predict potential quality issues before they occur. Techniques such as anomaly detection, multivariate modeling, and deep learning allow continuous monitoring of critical quality attributes (CQAs) and critical process parameters (CPPs). This predictive approach significantly reduces human error, enhances decision-making, and ensures consistent product quality. Furthermore, digital twins and adaptive process control technologies create virtual replicas of manufacturing processes, enabling simulation, optimization, and proactive risk mitigation. The poster also highlights integration challenges, including data integrity, model transparency, and regulatory acceptance ,particularly within the framework of Quality by Design and Good Manufacturing Practices (GMP). However, the adoption of explainable AI (XAI) and robust validation strategies is bridging these gaps, promoting safer and more reliable pharmaceutical production.

Overall, AI-enabled predictive quality control represents a transformative shift toward intelligent, automated, and resilient manufacturing systems, paving the way for the next generation of high-quality pharmaceutical products.

Keywords: Artificial Intelligence, Predictive Quality Control, Pharmaceutical Manufacturing, Machine Learning, PAT, Digital Twin, Quality by Design, Real-Time Monitoring, Anomaly Detection, Process Optimization, GMP.

PIET-APSECON-37

3D Printing for Precision Polymer-Based Drug Delivery Systems: A Paradigm Shift in Personalized Medicine

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Abstract

Three–dimensional (3D) printing or Additive Manufacturing (AM) has emerged as a transformative technology in pharmaceutical science, offering a major shift from conventional mass manufacturing to personalized medicine. Conventional pharmaceutical manufacturing often faces limitations in producing dosage forms with tailored release profiles and patient-specific dosing, driving the demand for advanced fabrication technologies. Technologies such as material extrusion (FDM, LDM); material jetting (inkjet based printing); VAT photopolymerization (SLA, DLP), powder bed fusion (SLS); sheet lamination (laminated object manufacturing, composite based additive manufacturing) offers unprecedented control over the final dosage form's geometry, size and internal architecture, enabling true personalization. Polymers exploited in 3DPP provides a safe and effective platform for delivering therapeutic effects to target in the body such as biocompatible polymers (PLGA, PEG); thermoplastic polymers (PVA); hydrogels (gelatin, aglinate) etc. By leveraging AM's design freedom, researchers can create complex structures, such as core–shell tablets, porous scaffolds, and multi-layer systems. This intricate structural control allows for the precise tuning of drug release kinetics, facilitating zero-order, or sustained-release mechanisms previously challenging to achieve simultaneously. The primary advantages of 3DP in this field include rapid prototyping, the ability to co-load multiple active pharmaceutical ingredients, and potential integration with patient biometric data for on-demand manufacturing. In conclusion, 3D printing represents a critical paradigm shift, moving pharmaceutical development from a mass-production model towards precision-engineered and highly efficacious drug therapies tailored to individual patient needs

Keywords: 3D printing, polymer, DDS, personalized medicine, FDM, SLA.

PIET-APSECON-38

The New Era of Drug Discovery: The Power of Computer Aided Drug Design

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Abstract

Drug discovery is entering a transformative era powered by computational innovation. Computer-Aided Drug Design (CADD) integrates chemistry, biology, informatics, and Artificial Intelligence (AI) and Machine Learning (ML) an important tool in the discovery and development of new medicines. Traditional discovery pipelines are slow, costly, and uncertain, but CADD can study large sets of chemical structures, predict their activity, and suggest the most promising drug candidates. These technologies save time, reduce research costs, and lower the chance of failure in later stages of drug development. The work focuses mainly on the conceptual design phase, using computational techniques such as molecular docking, QSAR modelling, and rule-based virtual screening. Commonly used docking software includes Maestro, AutoDock, AutoDock Vina, Glide, DOCK, rDock, FlexAID, InstaDock, CaverDock, DockStream which are widely adopted for their speed and accessibility. Molecular docking involves a series of steps to predict the interaction between a ligand and its target protein includes protein preparation (obtained from Protein data bank (PDB)), removing water molecules, adding hydrogens, and grid preparation at the binding site. Then ligands are prepared by generating their 3D conformations & optimization of ligands. Docking is performed by placing the ligands into the binding site in multiple orientations, generates multiple ligand poses, which are scored to estimate binding affinity. Finally, the top-ranked poses are analyzed to examine key interactions, enabling the identification of promising compounds for further optimization or experimental validation.

Keywords: Drug discovery, CADD, docking, protein, ligand.

PIET-APSECON-39

Next Generation Cosmeceuticals: Formulation & Evaluation of Probiotic -Infused Skincare Product

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Abstract

The demand for advanced skincare solutions has led to the rapid evolution of next-generation cosmeceuticals, with probiotic-infused formulations emerging as a promising approach for maintaining skin health. Probiotics and their bioactive metabolites (postbiotics) play a crucial role in restoring skin microbiome balance, enhancing barrier function, reducing inflammation, and improving overall skin appearance. Despite their potential, the successful incorporation of probiotics into topical formulations remains challenging due to stability issues, viability loss, and sensitivity to environmental conditions.

This poster focuses on the formulation and evaluation of probiotic-infused skincare products designed to improve skin health and resilience. Various formulation strategies—such as microencapsulation, lyophilized probiotic blends, lipid-based carriers, and hydrogel matrices—were explored to ensure probiotic stability and compatibility with cosmetic excipients. Key parameters including pH stability, viscosity, spreadability, viability count of probiotic strains, and product shelf life were systematically evaluated. Additionally, skin hydration, barrier repair, and anti-inflammatory effects were assessed through in-vitro and ex-vivo models.Results indicate that encapsulated probiotics demonstrated significantly enhanced stability and retained higher viability during storage compared to non-encapsulated forms. Formulations showed improved moisturization, reduced transepidermal water loss (TEWL), and noticeable soothing effects on irritated skin models. These findings support the potential of probiotic-infused skincare as next-generation cosmeceuticals that combine therapeutic benefits with cosmetic appeal.Overall, probiotic-based topical formulations offer a novel and effective strategy for microbiome-friendly skincare, paving the way for safer, more natural, and scientifically backed cosmeceutical innovations.

Keywords: Probiotics, Cosmeceuticals, Skin Microbiome, Probiotic-Infused Skincare, Microencapsulation, Formulation Development, Skin Barrier Function, Postbiotics.

PIET-APSECON-40

Green Synthesized Nanocarriers for Enhanced Herbal Drug Delivery: A Sustainable Approach

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Abstract

The integration of green nanotechnology with herbal therapeutics represents a transformative approach for developing safe, effective, and sustainable drug delivery systems. Herbal drugs possess significant pharmacological potential; however, their clinical use is often limited by poor solubility, instability, rapid metabolism, and low bioavailability. Green-synthesized nanocarriers, prepared using plant extracts, phytochemicals, or environmentally benign methods, offer a promising platform to overcome these challenges while minimizing ecological and chemical hazards associated with conventional synthesis.

This poster highlights the design, synthesis, and evaluation of green-mediated nanocarriers for enhanced herbal drug delivery. Nanocarriers such as green-synthesized metallic nanoparticles, polymeric nanoparticles, and lipid-based systems were formulated using plant-derived reducing, stabilizing, and capping agents. Their physicochemical properties—including particle size, zeta potential, entrapment efficiency, and surface morphology—were systematically characterized. Biological evaluations focused on antioxidant activity, drug release kinetics, cytocompatibility, and enhancement in therapeutic performance of selected herbal actives.

Findings demonstrate that green-synthesized nanocarriers exhibit improved stability, higher drug-loading capacity, and controlled-release behavior compared to conventional formulations. Enhanced bioavailability and superior biological activity were observed due to nanoscale size, increased surface area, and synergistic effects of plant-mediated synthesis. Moreover, the eco-friendly production process aligns with principles of sustainability and reduces reliance on toxic chemicals.

Overall, green-synthesized nanocarriers represent a sustainable and innovative strategy for advancing herbal drug delivery. Their ability to enhance therapeutic efficacy while supporting environmentally responsible practices positions them as the next generation of natural nanomedicine platforms.

Keywords: Green Nanotechnology, Herbal Drug Delivery, Nanocarriers, Sustainable Synthesis, Phytochemicals, Green-Synthesized Nanoparticles, Bioavailability, Eco-friendly Formulations.

PIET-APSECON-41

Standardization of Herbal Drugs for Global Quality Assurance

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Abstract:

The global proliferation of herbal drugs necessitates stringent standardization to ensure their quality, safety, and efficacy, addressing the inherent chemical complexity and variability of botanical sources. Standardization is the process of establishing reproducible measures of identity, purity and potency moving beyond traditional anecdotal evidence. The contemporary approach integrates three pillars: Botanical/Genetic Authentication (crucially through methods like DNA Barcoding to confirm the correct plant species), Physico-Chemical Quality Control (determining parameters like moisture, ash content, and limits for contaminants such as heavy metals and pesticides) and Chemical Fingerprinting. The central element of modern standardization involves sophisticated analytical technologies, such as Hyphenated Chromatography (UHPLC-MS/MS), integrated with multivariate statistics (Chemometrics). This system generates a comprehensive chemical fingerprint, a unique chromatographic or spectral profile that verifies the consistency of the entire extract composition against a validated reference standard. This method of assessing chemical integrity is highly effective in managing batch variability, detects adulteration and provides a scientifically rigorous foundation for quality assurance, thereby bridging the gap between traditional medicine and modern pharmacological demands for global regulatory acceptance.

Keywords: Herbal drugs, Standardization, Authentication, Chromatography, Quality Control

PIET-APSECON-42

Engineered Therapeutic Architectures: A Computational and Biomaterial-Driven Approach to Advanced Drug Delivery

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Abstract

The paradigm of pharmaceutical development is shifting from conventional dosage forms towards sophisticated Novel Drug Delivery Systems (NDDS). This evolution is centered on the precision engineering of therapeutic architectures to control the spatiotemporal release of active pharmaceutical ingredients (APIs). Modern formulation design leverages a synergistic combination of advanced biomaterials, computational modeling, and nanotechnology to overcome persistent challenges in drug therapy, such as poor bioavailability, non-specific targeting, and suboptimal patient adherence. The development pipeline now integrates in silico tools for predictive formulation optimization, high-throughput screening of excipient compatibility, and the rational design of multi-functional carriers like lipid nanoparticles, polymeric micelles, and stimuli-responsive hydrogels. These systems are engineered to navigate biological barriers, respond to specific pathological cues, and deliver therapeutics with unprecedented accuracy to diseased cells, thereby maximizing efficacy while minimizing off-target effects. The convergence of these disciplines is accelerating the clinical translation of NDDS for a wide array of applications, from targeted oncology treatments and long-acting injectables for chronic diseases to nucleic acid delivery for genetic therapies. Ultimately, the frontier of formulation science lies in creating intelligent, personalized therapeutic systems that promise to redefine treatment efficacy and patient-centric care.

Keywords: Formulation Engineering, Novel Drug Delivery Systems (NDDS), Computational Pharmaceutics, Targeted Drug Delivery, Advanced Biomaterials, Nanotherapeutics, Pharmacokinetic Optimization, Personalized Medicine.

PIET-APSECON-43

Integrating Drug Science and Practice: A Comprehensive Overview of Key Pharmacy Disciplines

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Pharmacy practice encompasses a broad spectrum of scientific and clinical disciplines that collectively ensure the safe, effective, and rational use of medications. Pharmacology and toxicology form the foundational sciences, providing essential insights into the therapeutic actions, mechanisms, pharmacokinetics, adverse effects, and toxicity profiles of drugs and chemicals. Pharmacovigilance extends this foundation by systematically monitoring, detecting, assessing, and preventing adverse drug reactions, thereby strengthening post-marketing drug safety, and supporting regulatory decision-making. Clinical and hospital pharmacy integrate evidence-based practices into patient care through medication therapy management, dose optimization, drug interaction monitoring, sterile compounding, and collaboration within multidisciplinary healthcare teams. Community pharmacy plays a critical role at the primary healthcare level by ensuring accessible medication dispensing, patient education, counselling on over-the-counter products, and basic health screening. Together, these four domains contribute to a comprehensive pharmaceutical care framework that enhances therapeutic outcomes, minimizes medication-related risks, and supports public health.

Keywords: Pharmacology; Toxicology; Pharmacovigilance; Clinical Pharmacy; Community Pharmacy.

PIET-APSECON-44

Artificial Intelligence in Drug Discovery: Accelerating the Path to Novel Therapeutics

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Abstract

Artificial Intelligence (AI) is driving a paradigm shift in the world of pharmaceutical sciences in that the long and costly pipeline of drug discovery and development has been dramatically accelerated. Traditional modalities usually require years of empirical research in addition to significant financial inputs thus creating high attrition rates between the preclinical and clinical stages. Machine learning, deep learning and generative models represent AI-enabled methodologies that can be used as powerful tools to analyze large datasets that are obtained through genomics, proteomics and chemical libraries. These technologies enable the high-speed target discovery of drug able targets, precise prediction of compound efficiency, and an engineered design of optimally designed molecular structures. Some key AI advances include virtual screening and de novo drug design where computational algorithms create new chemical species and project drug pharmacokinetic and pharmacodynamic properties. AI also enhances drug repurposing, introduces a cost-effective intervention in new pathologies, and improves the structure of clinical trials by damaging patients and providing customized treatment strategies. Despite the issues related to data quality and regulatory approval, AI continues to reduce the timelines of development, reduce costs, and increase the chances of success, which leads to the change of the paradigm in the pharmaceutical innovation.

Keywords: Artificial Intelligence, Drug Discovery, Drug Development, Machine Learning, Generative Models.

PIET-APSECON-45

The Pharmacist's Role in Advancing Epigenetic Cancer Therapy

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Abstract:

Epigenetic regulation plays a critical role in cancer development by altering gene expression without modifying the underlying DNA sequence. Key mechanisms such as DNA methylation, histone modification, and chromatin remodelling contribute to tumour progression and therapeutic resistance, making them promising targets for modern oncology. As the understanding of these mechanisms evolves, the pharmacist's role becomes essential in translating epigenetic discoveries from the research bench to the patient's bedside. In laboratory and preclinical settings, pharmacists contribute to the design, evaluation, and optimization of epigenetic agents, including DNA methyltransferase (DNMT) inhibitors, histone deacetylase (HDAC) inhibitors, and emerging modulators of histone methylation and chromatin structure. Their expertise ensures appropriate assessment of drug behaviour, safety profiles, and synergistic potential in combination therapies. At the clinical level, pharmacists guide therapy selection, monitor treatment response, manage adverse drug reactions, and educate patients, clinicians on novel epigenetic drugs. They further support personalized medicine by interpreting molecular biomarkers and integrating epigenetic insights into individualized treatment plans. By bridging scientific innovation with patient-centered care, pharmacists play a pivotal role in advancing epigenetic cancer therapy. Their involvement across the research-to-clinic continuum ensures safe, effective, and evidence-based application of these emerging therapeutic strategies, ultimately improving patient outcomes.

Keywords: Pharmacist, Epigenetics, Cancer Therapy, DNA Methylation, Histone Modification.

PIET-APSECON-46

Advancing Patient Care Through Pharmacogenomics: The Evolving Role of the Pharmacist

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Abstract

Pharmacogenomics is the study of how genes influence an individual's response to medications is transforming the landscape of personalized medicine. As this field continues to evolve, pharmacists are emerging as key players in integrating genetic insights into routine patient care. Their deep understanding of pharmacokinetics and pharmacodynamics positions them uniquely to interpret pharmacogenomic data and guide medication selection, dosing, and monitoring. By tailoring drug therapy based on a patient's genetic profile, pharmacists can help reduce adverse drug reactions, improve therapeutic outcomes, and enhance medication adherence. This abstract explores how the pharmacist's role is expanding beyond traditional dispensing to include active participation in precision medicine initiatives. From collaborating with physicians to educating patients about genetic testing, pharmacists are becoming essential in bridging the gap between complex genomic data and practical clinical application. As healthcare systems increasingly adopt pharmacogenomic testing, pharmacists must be equipped with the necessary training, tools, and support to navigate ethical, legal, and logistical challenges. Ultimately, embracing pharmacogenomics empowers pharmacists to deliver more individualized, effective, and safer care—marking a significant shift toward a more proactive and patient-centered healthcare model.

Keyword: Pharmacogenomics, Personalized medicine, Pharmacist role, Drug response, Genetic testing

PIET-APSECON-47

Pharmacoenvironmentology: Assessing the Environmental Footprint of Pharmaceuticals

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Abstract

Pharmacoenvironmentology is an emerging discipline that focuses on understanding the environmental impact of pharmaceuticals throughout their lifecycle—from production and consumption to disposal and environmental release. As global drug use increases, significant amounts of active pharmaceutical ingredients (APIs) enter soil, water bodies, and ecosystems through human excretion, improper disposal, industrial waste, and agricultural runoff. These residues can persist in the environment, leading to adverse effects such as endocrine disruption, antimicrobial resistance, aquatic toxicity, and bioaccumulation in living organisms. Pharmacoenvironmentology helps evaluate these risks by integrating environmental pharmacokinetics, ecotoxicology, and regulatory science. It guides the development of greener pharmaceuticals, sustainable manufacturing practices, and improved waste-management systems. Regulatory agencies worldwide, including the FDA, EMA, and CDSCO, now emphasize Environmental Risk Assessment (ERA) as a mandatory component of drug approval to ensure ecological safety. With rising concerns over environmental sustainability, pharmacoenvironmentology plays a crucial role in shaping policies that balance therapeutic benefits with ecological protection. This discipline is essential for promoting responsible drug development, safeguarding biodiversity, and ensuring long-term environmental health.

Keywords: Pharmacoenvironmentology, Environmental risk assessment, pharmaceutical pollution, Ecotoxicology, Sustainability

PIET-APSECON-48

Biosimilars and the Rulebook: Navigating Regulatory Pathways to Approval

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Abstract

Biosimilars are biologic medicines that are highly similar to already approved reference products, offering more affordable treatment options without compromising safety or efficacy. However, their development and approval are governed by strict regulatory guidelines that significantly shape the entire process. Regulatory agencies such as the FDA, EMA, and CDSCO have established specific pathways to ensure biosimilars meet rigorous standards for quality, safety, and clinical performance. These guidelines require extensive analytical testing, comparative clinical studies, and robust pharmacovigilance plans. While these measures are essential for patient safety, they also increase the complexity, time, and cost of biosimilar development compared to generic drugs. Harmonization of global regulatory standards remains a challenge, as different countries may have varying requirements. Despite these hurdles, clear regulatory frameworks have helped build trust in biosimilars and encouraged their adoption in healthcare systems worldwide. The evolving nature of these guidelines also reflects growing experience and scientific advancements, which may lead to more streamlined approval processes in the future. Overall, regulatory guidelines play a critical role in balancing innovation, safety, and accessibility in the biosimilar landscape, ultimately supporting broader access to life-saving biologic therapies.

Keywords: Biosimilars, Regulatory guidelines, Drug approval, Pharmacovigilance, Biologic therapies

PIET-APSECON-49

Cognitive Collaborators: How AI and Robotics are Forging a Symbiotic Future in Healthcare

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Abstract

A new era of symbiotic healthcare is emerging, powered by the fusion of artificial intelligence, machine learning, and robotics. These technologies are no longer mere tools but are becoming active collaborators in the clinical ecosystem. AI and ML algorithms act as a powerful cognitive layer, sifting through immense datasets-from medical images to genomic sequences-to uncover patterns invisible to the human eye. This enables predictive diagnostics, anticipating disease onset like sepsis or cancer progression, and paves the way for truly personalized treatment plans. Simultaneously, robotics provides a physical extension of this intelligence. Advanced surgical systems offer superhuman precision, minimizing invasiveness and improving recovery times. In rehabilitation, intelligent exoskeletons adapt in real-time to a patient's movements, while autonomous robots streamline hospital workflows by managing logistics and sterilization. The true transformation lies in the convergence: AI's analytical power guides robotic actions, creating a continuous feedback loop that enhances both decision-making and physical intervention. This synergy is shifting healthcare from a reactive model to a proactive, patient-centric paradigm, promising not only greater operational efficiency but also significantly improved outcomes and accessibility for all.

Keywords: AI in Healthcare, Machine Learning, Surgical Robotics, Predictive Diagnostics, Personalized Medicine, Clinical Automation, Intelligent Systems, Human-Robot Collaboration.

PIET-APSECON-50

Regulatory Intelligence: The Hidden Engine of Drug Innovation

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Abstract

Regulatory affairs play a vital role in the pharmaceutical industry by ensuring that drugs are developed, tested, and approved in compliance with national and international standards. From the early stages of drug discovery to final market authorization, regulatory professionals act as a bridge between scientific innovation and legal requirements. They help navigate complex regulations set by agencies such as the FDA, EMA, and CDSCO, guiding companies through clinical trial approvals, safety evaluations, and documentation processes. Their involvement ensures that every step of drug development meets strict quality, safety, and efficacy standards. Regulatory affairs also manage communication with health authorities, prepare submission dossiers, and monitor post-marketing surveillance to track adverse effects. In today's fast-evolving landscape, their role has expanded to include digital health products, biosimilars, and accelerated approval pathways. By staying updated on changing regulations and maintaining compliance, regulatory affairs professionals help reduce delays, avoid costly errors, and protect public health. Their work is essential not only for successful product launches but also for maintaining trust in the healthcare system. As drug development becomes more global and complex, the importance of regulatory affairs continues to grow, making it a cornerstone of pharmaceutical success.

Keywords: Regulatory Affairs, Drug development, Market authorization, Compliance, Pharmaceutical industry

PIET-APSECON-51

Digital Orthodontics: Transforming Diagnosis and Treatment Planning

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Abstract

The integration of digital technologies into orthodontics has significantly transformed clinical practice, enhancing diagnostic accuracy, treatment efficiency, and patient experience. Digital orthodontics encompasses a range of innovations including intraoral scanning, cone-beam computed tomography (CBCT), 3D printing, and artificial intelligence (AI)-driven treatment planning. These tools enable precise visualization of craniofacial structures, facilitate virtual simulations of tooth movement, and support the fabrication of customized appliances such as clear aligners and indirect bonding trays. Intraoral scanners eliminate the need for traditional impressions, improving patient comfort and data accuracy. CBCT provides comprehensive 3D imaging for complex cases involving impacted teeth, skeletal discrepancies, or airway analysis. AI algorithms assist in automating cephalometric analysis and predicting treatment outcomes, thereby reducing planning time and enhancing decision-making. Digital workflows also streamline communication between clinicians, laboratories, and patients, fostering collaborative care. Despite the benefits, challenges such as cost, learning curve, and data security must be addressed to ensure widespread adoption. As digital orthodontics continues to evolve, it promises to redefine standards of care, making treatment more personalized, efficient, and accessible.

Keywords: Digital orthodontics, Intraoral Scanning, 3D printing, Artificial intelligence, Virtual treatment planning

PIET-APSECON-52

Formulation-Analytical Integration for Tofacitinib: Development of Nanovesicular Gels and a Robust RP-HPLC Method for RA Management

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ABSTRACT

Rheumatoid arthritis (RA) is a progressive autoimmune disorder requiring effective and targeted therapy to minimise systemic adverse effects. Tofacitinib, a Janus kinase inhibitor, shows therapeutic promise but is limited by poor aqueous solubility, variable oral bioavailability, and dose-dependent toxicity. To address these challenges, a combined formulation-analytical approach was undertaken to optimise liposomal and ethosomal delivery systems and to develop a validated RP-HPLC method for accurate quantification of tofacitinib in pure and formulated forms. Liposomes and ethosomes were prepared and optimised using a Box–Behnken design by evaluating critical variables such as lipid concentration, cholesterol content, and process parameters. Optimised liposomes exhibited particle sizes of approximately 164–166 nm with a PDI of 0.16 and high entrapment efficiency (≈92%), while ethosomes demonstrated nanoscale vesicles with enhanced deformability and efficient drug encapsulation. Incorporation into Carbopol gel resulted in stable, homogenous topical systems suitable for dermal delivery. Ex vivo permeation studies showed significantly improved drug penetration from vesicular gels, reaching 84.76% (liposomes) and 94.37% (ethosomes) at 24 hours, far exceeding the raw drug. Parallelly, the developed RP-HPLC method demonstrated excellent linearity (R^2 = 0.999), precision, accuracy (98–102% recovery), and sensitivity, confirming its suitability for routine analysis of tofacitinib formulations. Overall, the combined results establish ethosomal and liposomal gels as promising nanocarrier platforms for targeted RA therapy while supporting the analytical reliability required for future development.

Keywords- Tofacitinib**,** Liposomal and Ethosomal Gels**,** Nanovesicular Drug Delivery**,** RP-HPLC Method Validation**,** Box–Behnken Design (BBD)**,** Rheumatoid Arthritis Therapy

PIET-APSECON-53

Pharmacovigilance: AI & ML as the Future Guardians of Drug Safety

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Abstract

Pharmacovigilance plays a crucial role in safeguarding public health by monitoring, assessing, and preventing adverse drug reactions throughout the lifecycle of a pharmaceutical product. With the rapid growth of healthcare data, traditional manual methods are no longer sufficient to manage the complexity and volume of safety information. This shift has paved the way for the integration of Artificial Intelligence and Machine Learning in modern pharmacovigilance systems. AI-driven tools can automatically detect patterns, analyse large datasets, and identify potential safety signals faster than conventional approaches. Machine learning models enhance accuracy by continuously learning from real-world evidence, electronic health records, social media data, and clinical reports. These technologies not only improve signal detection but also streamline case processing, literature monitoring, and risk assessment. By reducing human errors and processing time, Artificial Intelligence and Machine Learning accelerate regulatory decision-making and ensure timely responses to emerging safety concerns. As the pharmaceutical industry becomes increasingly digital, the combination of pharmacovigilance with Artificial Intelligence and Machine Learning stands as a transformative force strengthening drug safety, improving patient outcomes, and shaping the future of global healthcare monitoring.

Keywords: Pharmacovigilance, Artificial Intelligence, Machine Learning, Drug Safety, Signal Detection, Healthcare Innovation

PIET-APSECON-54

Obstructive Sleep Apnea - A Coronary Artery Crucial Risk Factor

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Abstract:

Recurrent episodes of total or partial upper airway collapse during sleep are a hallmark of obstructive sleep apnea. Men are more likely than women to have obstructive sleep apnea, with a ratio of 2-4:1. Nasal obstruction, obesity, gender, craniofacial structure, and smoking are risk factors. Symptoms that recur, like daytime sleepiness and erratic snoring have prompted researchers and medical professionals to develop more suitable diagnostic techniques. The gold standard for diagnosing obstructive sleep apnea is polysomnography.

A home apnea test is one of the additional diagnostic methods. The two most popular noninvasive treatments for obstructive sleep apnea are oral appliances and positive airway pressure. The most successful surgeries, particularly in severe instances, are uvulopalatopharyngoplasty and maxillomandibular advancement. There are ways to prevent obstructive sleep apnea and maintain a healthy lifestyle, but it also causes difficulties and side effects that influence the patient's social and mental well-being in addition to their physical health.

Keywords: Apnea, maxillomandibular, polysomnography, obstructive and sleepiness.

PIET-APSECON-55

Approaches for the Safe Disposal and Potential Reuse of Expired Medicines

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Abstract

The improper disposal of expired medicines poses significant environmental and public health risks. When pharmaceuticals are discarded in household trash, flushed into sewage systems, or left unattended, they can contaminate soil and water resources, contribute to antimicrobial resistance, and increase the chances of accidental poisoning. Therefore, safe and systematic medicine disposal practices are essential. Recommended methods include returning expired drugs to authorised take-back programs, depositing them at pharmacy collection centers, and following regulated incineration or chemical neutralization processes managed by healthcare facilities and waste-management authorities. These procedures ensure that harmful compounds are destroyed or rendered inactive before entering the environment.

While most expired medicines should not be reused due to reduced potency, chemical instability, or microbial contamination, certain controlled reuse pathways exist under strict guidelines. Unopened and properly stored medications may be eligible for redistribution through government-approved drug donation and reuse programs, primarily in low-resource settings or disaster-response situations. Furthermore, some non-hazardous medications and packaging materials can be recycled after proper processing, contributing to a circular pharmaceutical economy. Research into pharmaceutical waste valorization—such as extracting active ingredients for industrial use or converting expired drugs into raw chemical feedstock—also offers promising avenues for sustainable reuse. Overall, safe disposal combined with regulated reuse strategies can reduce environmental burden, enhance public safety, and support more efficient healthcare resource utilization.

Key words: Potential reuse, Take-back programs, Pharmaceutical waste valorization

PIET-APSECON-56

Role of AI Machine - Learning & Robotics in Healthcare, etc.

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Abstract

Technology is revolutionizing the healthcare system at a rapid pace, and powerful innovations like Artificial Intelligence (AI), Machine Learning, and Robotics are playing a major role in improving how diseases are diagnosed, treated, and managed. AI allows machines to think, analyze, and make decisions like humans, helping doctors detect life-threatening diseases such as cancer, diabetes, and heart disorders at an early stage when treatment is most effective. It also helps predict a patient's health condition in the future, manage hospital data more efficiently, reduce long waiting times, and support surgeons during complicated operations through advanced smart tools. Machine Learning, which is a crucial part of AI, enables computers to learn from medical data such as X-rays, MRI scans, and blood test results to identify patterns that humans can sometimes miss. This helps in providing personalized treatment plans that are specially designed for each patient's needs and improves the chances of recovery. It also plays an important role in predicting the spread of infectious diseases like COVID-19, helping governments and doctors take preventive measures on time. On the other hand, Robotics has brought a new level of precision and safety to medical surgeries, where robotic arms can perform operations with accuracy and minimum mistakes. The future of healthcare looks transformative, with smart hospitals, fully robotic surgeries, AI doctors working beside human doctors, quick discovery of life-saving medicines, and improved global health monitoring to prevent diseases before they spread.conclusion, AI, Machine Learning, and Robotics are bringing a positive revolution in healthcare by making medical services faster, safer, and more accurate, ensuring that the future of healthcare will rely on smart technology working hand in hand with doctors to save lives and improve quality of life for everyone.

Keyword: Healthcare technology, Artificial Intelligence (AI), Machine Learning (ML)
Robotics in medicine, Predictive analytics

PIET-APSECON-57

Vesicular Nanocarrier Systems For Enhanced Topical Delivery Of Quercetin In Psoriasis

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Abstract:

A chronic immune-mediated skin disorder that affects social and interpersonal relationships moderately, Psoriasis, is mainly characterized by epidermal hyper-proliferation and irregular keratinocyte differentiation. Available traditional treatments for psoriasis have some issues, including limited medication, penetration into the skin, hyperpigmentation, and burning sensation on both healthy and psoriatic skin. Current therapeutic approaches often involve immunosuppressive drugs with considerable side effects and high costs. By modifying the NF-κB, STAT3, and SIRT1 pathways, quercetin showed significant antioxidant, anti-inflammatory, and immunomodulatory qualities.

However, clinical translation is severely limited by their hydrophobic nature, chemical instability, and inadequate skin penetration. Nanotechnology-based vesicular delivery systems enhance bioavailability and therapeutic efficacy. Based on recent literature research of vesicular methods offer a wide potential for effective management of psoriasis in the upcoming decades of therapy. The psoriasis pathophysiology, its types and causes, traditional psoriasis treatment options, the necessity of vesicular drug delivery systems, and recent research on vesicular drug delivery systems for psoriasis treatment are all included in this thorough overview.

This also evaluates the therapeutic potential of quercetin with particular emphasis on psoriasis and examines nanotechnology-based delivery systems, including liposomes, niosomes, ethosomes, and transferosomes, to overcome pharmacokinetic limitations. In conclusion, quercetin combined with advanced nanocarriers offers a novel approach for psoriasis management.

Keywords: Vesicular nanocarrier, autoimmune diseases, psoriasis, nanotechnology, quercetin

PIET-APSECON-58

Nano-Ethosome System For Treatment Of Psoriasis

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Abstract:

Background Psoriasis is a chronic, immune-mediated skin disorder characterised by erythematous plaques, excessive keratinocyte proliferation, and disrupted skin barrier function. Ethosomes—soft, phospholipid-based nanocarriers enriched with ethanol—have emerged as a promising transdermal delivery system capable of enhancing drug permeation into deeper skin layers.

Aim: To investigate the potential of nano-ethosome systems as an advanced and patient-friendly topical platform for improving the therapeutic management of psoriasis.

Objective: To discuss formulation strategies, composition, and optimization parameters involved in developing nano-ethosomal systems for topical psoriasis therapy.To identify challenges, limitations, and future research directions for translating nano-ethosome-based treatments into clinical practice.

Conclusion*:* Their unique ability to penetrate deep skin layers, enhance drug retention, and provide sustained release makes them highly suitable for managing chronic inflammatory skin conditions ethosomes have the potential to offer improved symptom control, reduced dosing frequency, and better patient compliance in long-term psoriasis care.

Key words*:* Ethosomes, Psoriasis, Transdermal delivery, Novel drug delivery system (NDDS), Topical therapy.

PIET-APSECON-59

Proniosomes as a Targeted drug delievry system for Acne and Pigmentation Management

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Abstract:

Background:. Acne vulgaris and post-inflammatory hyperpigmentation are dermatological conditions that severely impact patient quality of life. While Salicylic Acid (SA) is a gold-standard keratolytic and anti-inflammatory agent, its conventional topical application is often limited by low aqueous solubility, potential for localized irritation, and insufficient penetration into the pilosebaceous unit.

Aim:.The primary aim of this study is to formulate, characterize, and optimize Salicylic Acid-loaded proniosomes—a stable, dry, free-flowing granular carrier—to enhance transdermal bioavailability, minimize skin irritation, and ensure targeted follicular delivery for the simultaneous management of acne and pigmentation.

Objective: Key Components and Preparation Techniques of Proniosomes for Targeted Dermatological Delivery.Advances in Proniosomal formulation effective topical delivery of Anti-Acne and Depigmenting Agents

Conclusion: Salicylic Acid-loaded proniosomes represent a superior, stable, and non-irritating alternative to conventional topical therapies. This novel delivery system offers a promising therapeutic strategy for the effective, long-term management of acne and associated pigmentation.

Key words: Salicylic Acid, Proniosomes, Acne Vulgaris, Hyperpigmentation, Transdermal Drug Delivery, Controlled Release.

PIET-APSECON-60

Advances in Nanoemulsion-Based Novel Drug Delivery Systems

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Abstract:

Background: Nanoemulsions have emerged as one of the most promising carriers in Novel Drug Delivery Systems (NDDS) due to their ability to enhance the solubility, stability, and bioavailability of poorly water-soluble drugs. Sizes ranging from 20–200 nm. Recent advances include the development of targeted nanoemulsions, stimuli-responsive systems, nanoemulgels, and green surfactant-based nanoemulsions

Aim: To explore recent developments, formulation strategies, and therapeutic potential of nanoemulsion-based NDDS, highlighting how advances in composition, fabrication techniques, and characterization have improved drug delivery performance.

Objective: To discuss advances in formulation strategies, component selection, and preparation techniques that improve stability, droplet size, and drug-loading efficiency of nanoemulsions.To identify current challenges, limitations, and future research directions needed to optimize nanoemulsion-based drug delivery technologies for clinical translation.

Conclusion: These systems now offer superior bioavailability, controlled release, enhanced permeation, and targeted delivery, making them highly suitable for various therapeutic areas including dermatology, oncology, and ocular and oral drug delivery

Key words: Nanoemulsion, Bioavailability, Controlled release and Pharmaceutical nanotechnology.

PIET-APSECON-61

A Comprehensive Review on Phytochemistry and Biological Activities of *Pyracantha koidzumii*

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ABSTRACT

Pyracantha koidzumii (Hayata) commonly known as Formosa firethorn, is an evergreen shrub belonging to the family Rosaceae. Pyracantha is a plant with edible and medicinal value and widely distributed from Eastern Asia to Southern Europe but it is underutilized and has great potential .*Pyracantha koidzumii* contains a wide range of phytochemicals ,with major categories including flavonoids (Quercetin ,Rutin),Phenolic acids(gallic acid),Biphenyl and Dibenzofuran derivatives and carbohydrates /polysaccharides (glucose ,galactose) .Small amount of alkaloids and steroids are also present .These phytochemicals contribute the various biological activities including antioxidative, anti-inflammatory ,antimicrobial and tyrosinase inhibitory effects. These bioactive substances have potential applications in health foods and cosmetics due to their beneficial properties.

KEYWORDS: Pyracantha, Steroids, Polysaccharides, Antioxidative, Anti-inflammatory.

PIET-APSECON-62

Phytochemical Screening And Evaluation Of Euphorbia Tirucalli

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Abstract

Euphorbia tirucalli, a succulent shrub or small tree in the *Euphorbiaceae* family, is also referred to as the pencil tree or pencil cactus. Originally from semi-arid tropical regions of Africa, it has spread throughout the world as an ornamental and hedge plant. The species is distinguished by its characteristic green, cylindrical, pencil-like branches, which serve as the main organs for photosynthetic processes and, when damaged, release a milky, irritating latex. E. tirucalli has long been used in a variety of ethnomedical traditions to treat illnesses like infections, skin diseases, respiratory issues, and inflammatory symptoms. Terpenoids, diterpene esters, and other bioactive components are among the several types of secondary metabolites found in its rich latex and tissues, which may be responsible for its pharmacological potential. Thus, E. tirucalli is a significant medicinally relevant plant, and in order to promote future phytochemical and pharmacological research, a thorough understanding of its botany, distribution, traditional usage, and chemical profile is crucial.

Keywords: Euphorbia tirucalli, Photosynthetic organs, Ethnomedicine, Anti-inflammatory uses, Secondary metabolites

PIET-APSECON-63

FORMULATION AND EVALUATION OF NATURAL RICE WATER FACE CREAM FOR SKIN HYDRATION AND ANTI-AGING

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ABSTRACT:

The objective of this research was to develop a stable, safe, and effective topical cream utilizing rice extract to enhance skin hydration, improve complexion, and provide protection against environmental pollution. Rice *(Oryza sativa)* has long been known in traditional Asian skincare for its soothing, brightening, and antioxidant properties. The present study focuses on the formulation, preparation, and evaluation of a cosmetic face cream incorporating rice extract as a natural, bioactive ingredient.In this study, rice extract was prepared by aqueous and ethanolic extraction methods to maximize the yield of bioactive phytochemicals such as ferulic acid, vitamin E, y-oryzanol, and essential amino acids. The cream base was formulated using standard oil-in-water (O/W) emulsion techniques by employing emulsifying wax, stearic acid, glycerin, and non-irritant stabilizers. Rice extract was incorporated at varying concentrations (2%, 4%, 6%) to assess its influence on physicochemical properties and overall performance.Evaluation parameters included organoleptic characteristics, pH (7.22), viscosity (4406.3cps), spreadability(3.38gmcm/sec), emulsion stability and microbial limit tests.

This study concludes that rice extract can be successfully incorporated as a natural, functional ingredient in cosmetic creams, providing enhanced skin moisturization and brightening effects. This formulation offers a promising, safe, and cost-effective alternative for natural skincare product development.

Keywords: Rice extract, Antioxidant activity, Bioactive phytochemicals, Essential amino acids, Cost-effective formulation

PIET-APSECON-64

A Comprehensive Review Of The Medicinal And Therapeutic Potential Of The Bromeliaceae Plant Family.

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Abstract

The Bromeliaceae (bromeliad family) are a diverse family of monocot flowering plants known for their distinctive adaptations and ornamental value. They are found almost in the tropical and subtropical Americas, with over 3,700 species in about 80 genera. The various species of family bromeliad have been studied for phytochemicals investigation, biological activities like antioxidant, anti-microbial, anti-inflammatory. The main phytochemicals found across the Bromeliaceae family include a diverse range of compounds, most notably flavonoids, triterpenoids/steroids, phenolic compounds (including tannins and cinnamic acid derivatives), fatty acids and proteolytic enzymes that shows various properties like anti-inflammatory, anti- microbial, anti-parasitic etc. Literature reviews of this family shows that these species have various phytoconstituents which are responsible for their medicinal importance. There are still various unexplored species of this family and more research is required to explore their medicinal potential.

Keywords: Bromeliaceae, anti-oxidant, phytochemical, anti-inflammatory, proteolytic, etc.

PIET-APSECON-65

Phytochemistry and Pharmacological Applications of Xanthosoma sagittifolium

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Abstarct

Xanthosoma sagittifolium, commonly known as tannia or cocoyam, gives a phytochemical profile that recognises its importance in pharmaceutical research. The tubers and leaves of the plant are rich in primarily starch, alongside dietary fibers, proteins, and essential minerals. Phytochemical analysis has detected phenolic compounds, flavonoids, tannins, saponins, and alkaloids compounds throughout the plant. These secondary metabolites show antioxidant, anti-inflammatory, and antimicrobial properties. Additionally, the mucilage and polysaccharides in the plant exhibits useful attributes, including viscosifying and film-forming capabilities, which are crucial for drug formulation. The presence of vitamins such as vitamin C, carotenoids, and trace phytosterols further contributes to its bioactivity and therapeutic potential. *X. sagittifolium* has been utilized for its soothing, anti-ulcer, and

wound-healing properties, supported by scientific proof. Extracts rich in phenolics shows significant free-radical-scavenging abilities, indicating potential protective roles against oxidative stress-related disorders. The anti-inflammatory activities of leaf and tuber extracts are attributed to flavonoids and tannins, which may regulate inflammatory mediators. Antimicrobial studies show effectiveness against selective bacterial and fungal strains, suggesting its applications in topical formulations and natural preservatives.

The starch and mucilage hold promise as natural excipients in pharmaceutical technology, suitable for controlled-release systems, bioadhesive gels, and biodegradable films. Their biocompatibility and low toxicity further support their use in wound dressings, transdermal patches, and oral drug delivery systems. Overall, *Xanthosoma sagittifolium* presents valuable phytochemical constituents combined with multifunctional pharmacological properties, highlighting its potential in natural-product-based therapeutics and excipient development.

Keywords: *Xanthosomonas saggitifolium,* Starch properties, Gelatinization, Pasting behavior, Thermal stability.

PIET-APSECON-66

Recent Advances in Hair Care and Bioactive-Based Treatments

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ABSTRACT

The hair care industry has witnessed significant growth due to increasing consumer awareness regarding personal grooming and hair health. From just cleaning, the emphasis has drastically changed to repair, tensile strength, oxidative damage reduction, and growth stimulation. Shorter, newer techniques have emerged to make hair become more manageable, smooth, and shiny naturally. For various hair kinds, such as dry, dry-damaged, greasy, coloured, and grey hair, specialized grooming solutions have been developed to cleanse, calm, and condition the hair. Other products, like hair dyes, are designed to change the structure or colour of the hair shaft. The 'lift' of the hair shaft can be changed by hair sprays and waxes/gels.

Dermatologists are experts at treating scalp disorders and hair problems more successfully depending on hair type and ethnic variety by combining their understanding of cosmetic resources with their knowledge of hair care products, how to use them, and reduce any potential side effects. With increasing awareness around hair health and chemical ingredients, consumers are becoming more cautious about the products they use. Electron microscopy revealed that the cuticles on hairs treated with hair treatments were less likely to peel and come off than those on hairs not treated with hair treatments. In order to properly care for their hair, people should therefore educate themselves as much as possible about hair cosmetics. The general public should be able to quickly obtain reliable information from hair cosmetic companies but the aesthetic uses of more recent cosmetic treatments are still a mystery.

Keywords: Shampoo, Conditioner, Hair Styling Product, Hair types.

PIET-APSECON-67

Development And Validation Of Spectrophotometry Method For Determination Of Celecoxib In Capsule Formulation

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ABSTRACT

Celecoxib is a NSAIDs or nonsteroidal anti-inflammatory drug pre-owned in the therapy of knee pain and body inflammation, correlated with inflammatory disorders, and assorted other rheumatoid arthritis. The drug manifest absorption maxima at 253nm. A new uncomplicated, precise, diplomatic, highly certain and economical ultraviolet spectrophotometric (UV) method for the expandation of celecoxib drug in mass or bulk and its pharmaceutical expression or formulation (capsules) has been expended. The absorbance sample of celecoxib in a combination of methanol and 0.1 N sodium hydroxide (1 : 1 v/v) were expended or set on at 253 nm. Beer's law is bow to above concentration range of 1-13 µg/ml with correlation coefficient r^2>0.998. The conclusions have been verified mathematically and by recovery studies. The results of analysis were handled statistically. The conclusion of calculation for the procedure has been verified mathematically and by recovery study. An uncomplicated, specific, precise, cheap, and eco-friendly spectroscopy analytical procedure has been confirmed. This procedure appear good linearity in the scale of 1 to 13 µg/ml for celecoxib. This analyticall method was verified or validated for LOD, LOQ, accuracy, interday, intraday, accuracy studies, and stability as per the ICHguidelines, and the validated results were well within the allowable range. Method was flourishing employed for the expendation of celecoxib drug in the existence of the expression or formulation, and analytically compared between the suggested procedures. Terefore, the suggested methods can be employed for routine quality control(QC) studies.

Keywords: Celecoxib, UV Spectrophotometry, Analytical method, Spectrophotometry analysis, COX-2 inhibitors.

PIET-APSECON-68

Cosmetic Potential Of Hibiscus Rosa-Sinensis (China Rose) In Skin And Hair Care

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ABSTRACT

Hibiscus rosa-sinensis, commonly known as China Rose, is a tropical flowering plant valued not only for its ornamental application but also for its remarkable cosmetic potential. The plant contains different phytoconstituents such as anthocyanins, flavonoids, saponins, polysaccharides, vitamins and organic acids, which contribute to its therapeutic and cosmetics application. These bioactive components support antioxidant defense, promote hydration, and exhibit soothing and antimicrobial actions on the skin. Due to these properties, China Rose extracts are incorporated into various personal care formulations including facial gels, anti-aging creams, cleansers, and shampoos.

For skin care, the extract helps in maintaining moisture balance, improving texture, and enhancing elasticity by encouraging collagen production. Its gentle exfoliating action helps remove dead skin layers, making the skin appear smooth and glowing while reducing dark spots and acne-related stains. In hair care, the natural mucilage present in the plant conditions the hair, adds softness and shine, and helps control frizz. It is also traditionally known to nourish hair follicles, reduce hair breakage and support healthy hair growth.

China Rose offers a safe, environmentally friendly alternative to synthetic cosmetic ingredients, meeting consumer preferences for herbal, clean-label beauty products. Overall, Hibiscus rosa- sinensis is a multipurpose botanical ingredient with strong potential for the development of effective and sustainable cosmetic formulations. Continued research and standardization of extracts could further enhance its commercial applicability in the cosmetic industry with safe and effective treatment.

Keywords: Herbal cosmetics, China Rose, Hibiscus rosa-sinensis, antioxidant, skin hydration, hair care.

PIET-APSECON-69

Marine Bioactive Compounds: Innovations in the Treatment of Psoriasis

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Abstract

The various marine bioactive compounds are used in the treatment of psoriasis, it is a chronic skin disorder characterized by rapid skin cell proliferation and inflammation. Recent devclopments in research has shown various bioactive substances derived from marine organisms, such as algae, sponges, and mollusks, that exhibits unique therapeutic properties. Marine bioactive compounds, including fucoidans, phycocyanins, and peptides, are known for their anti-inflammatory, antioxidant, and immunomodulatory effects. These compounds have shown the ability to modulate important inflammatory pathways associated with psoriasis by influencing the cytokine production and reducing keratinocyte hyperproliferation. Scientific studies have shown that these bioactive substances can significantly enhance the symptoms of psoriasis, including scaling, redness, and itching. Their natural origin biactive compounds can be a alternative for patients seeking lower side effects associated with conventional therapies.

In conclusion, compounds found in marine organisms offer a new and positive direction for treating psoriasis. They give us novel ways to manage the disease by using the huge variety of life found in the marine ecosystem. More research is still required to understand exactly how marine bioactive compounds shows their potential and to develop safe, long-lasting treatments for people suffering with chronic disease.

Keywords: Marine bioactive compounds, psoriasis, immunomodulatory effects, chronic inflammation, novel therapies.

PIET-APSECON-70

Transferosome-Based Nanocarriers: A Novel Approach for Effective Management of Diabetic Retinopathy

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ABSTRACT

Transferosome-based drug delivery represents an emerging and highly effective platform designed to enhance the bioavailability, tissue penetration, and therapeutic efficacy of diverse pharmacological agents. These ultra-deformable lipid vesicles, composed of phospholipids and edge activators, can pass through biological barriers such as skin, ocular tissues, and mucosa by squeezing through narrow pores without structural disruption. This property makes transferosomes particularly valuable in ocular drug delivery, enabling targeted transport to posterior eye segments an important advancement for the treatment of diabetic retinopathy (DR).

Diabetic retinopathy, a major microvascular complication of diabetes and a leading cause of global blindness, poses significant therapeutic challenges. Conventional approaches like laser photocoagulation and intravitreal injections are limited by invasiveness, poor patient compliance, and brief drug retention. Transferosome-based formulations provide a promising non-invasive alternative by enabling sustained and site-specific delivery of bioactives such as curcumin. Due to its antioxidant, anti-inflammatory, and anti-angiogenic properties, curcumin is a potent therapeutic candidate, though its poor aqueous solubility restricts clinical translation. Transferosomal encapsulation markedly enhances its solubility, stability, permeability, and retinal bioavailability, yielding encouraging outcomes in preclinical diabetic models.

Keywords: Transferosome,Transdermal, Phospholipid, Permation, Curcumin

PIET-APSECON-71

Phytoconstituent Activity Prediction via PASS for Next-Generation Psoriasis Interventions

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Abstract

Psoriasis is a chronic inflammatory dermatosis characterized by immune dysregulation, leading to accelerated keratinocyte proliferation and the development of thick, erythematous, scaly plaques primarily affecting the scalp, elbows, knees, and lower back. These lesions cause itching, pain, and a considerable decline in quality of life. Plaque psoriasis represents the predominant clinical form, accounting for nearly 80–90% of cases. Although the Th17/IL-23 axis plays a pivotal role in disease pathogenesis, variations in disease progression and therapeutic response highlight the need for more personalized and targeted interventions.

Natural products have recently attracted attention for their potent anti-inflammatory and immunomodulatory properties in psoriasis management. Phytoconstituents such as curcumin, quercetin, and naringin exhibit favorable modulation of key inflammatory mediators. Computational pharmacology approaches using PASS software were employed to predict the bioactivities of plant-derived compounds including quercetin, curcumin, kaempferol, stigmasterol, taraxerol, aloesin, emodin, and mukulol against psoriasis-associated molecular targets such as TNF-α, antioxidant enzymes, lipoxygenase, cytochrome P450, and Janus kinase (JAK). This integrated computational and pharmacological exploration underscores the therapeutic potential of these phytoconstituents in psoriasis, providing a foundation for developing more effective and mechanism-oriented treatment strategies.

Keywords: Psoriasis, Curcumin, Quercetin, Inflammation, PASS analysis

PIET-APSECON-72

Molecular Mechanisms Underlying the Antitumor Effects of Rutin in Breast Cancer

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Abstract

Natural substances are gaining more attention in prevention and treatment of breast cancer due to adverse effects associated with conventional chemotherapeutic agents. These have potential in modulating oxidative stress, inflammation, autophagy, and apoptosis that leads to the cytotoxic effects of these substances. The antioxidant properties of naturally occurring agents contribute to their cancer preventive ability and lower toxicity compared to synthesized anticancer drugs. Among all natural products, Ruin (quercetin-3-O-rutinoside), a naturally occurring flavonol glycoside found in various fruits, vegetables such as buckwheat, apples, olives, teas, citrus, stone *fruits*, asparagus etc., has shown potential in breast cancer. It exerts potent anticancer activity against breast cancer through multiple cellular and molecular mechanisms. It inhibits cell proliferation, induces apoptosis, and arrests the cell cycle by modulating key signaling pathways such as PI3K/Akt/mTOR, MAPK/ERK, and NF-κB. It also suppresses metastasis and angiogenesis by down regulating matrix metalloproteinase and vascular endothelial growth factor. Its strong antioxidant and anti-inflammatory properties further contribute for reducing tumor progression and oxidative stress within the tumor microenvironment. Collectively, current evidence highlights Rutin as a promising natural compound for breast cancer therapy.

Key words: Cytotoxic effect, Rutin, Breast cancer, Natural product**,** Flavonol Glycoside

PIET-APSECON-73

Phytochemistry and Therapeutic Uses of Orbanche ramosa: Bridging Tradition and Science

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ABSTRACT

Orobanche ramosa (branched broomrape) is a destructive holoparasitic weed that poses a major challenge to global agriculture, especially in high-value crops such as tomato, tobacco, legumes, and sunflower. Since it lacks chlorophyll, the parasite relies entirely on host plants for water, minerals, and organic nutrients, making it exceptionally difficult to suppress once established. This comprehensive review highlights the biology, life cycle, host-parasite interactions, and current management strategies associated with **O. ramosa**, with emphasis on its impact on crop productivity and food security.

Seed germination in **O. ramosa** is initiated only when host roots release specific chemical cues—primarily strigolactones—ensuring that germination occurs in close proximity to a suitable host. Following germination, the developing seedling forms a haustorium, which penetrates host root tissues and connects directly to the vascular system. This intimate parasitic interface drains essential nutrients, disrupts normal physiological functions, and severely reduces crop vigor and yield. The weed's extensive soil seed bank, capable of surviving for many years, further complicates eradication efforts and contributes to recurrent infestations.

Multiple management approaches have been explored, including cultural methods, herbicide applications, soil solarization, biological control agents, and the development of resistant crop cultivars. However, no single strategy has proved universally effective. Integrated pest management (IPM), combining preventive, chemical, biological, and genetic tools, currently offers the most sustainable and practical solution.

Advancing research on host–parasite molecular signaling, enhancing resistant varieties, and promoting farmer awareness will be essential to mitigating the long-term agricultural threat posed by **Orobanche ramosa**.

Keywords: Orobanche ramosa, parasitic weed, strigolactones, haustorium, host–parasite interaction, IPM, resistant varieties, agricultural productivity, seed bank.

PIET-APSECON-74

Diabetes Mellitus: Pathophysiology, Challenges and Current Clinical Insights

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Abstract

Diabetes mellitus (DM) remains one of the most prevalent chronic metabolic disorders worldwide, with cases continuing to rise sharply in 2025 due to increasing obesity, sedentary behaviour, and changing dietary patterns. Characterized primarily by persistent hyperglycemia, diabetes results from impaired insulin secretion, defective insulin action, or a combination of both. The pathophysiology of Type 1 diabetes involves autoimmune destruction of pancreatic β-cells leading to absolute insulin deficiency, whereas Type 2 diabetes is driven by a progressive decline in β-cell function and insulin resistance in muscle, liver, and adipose tissues. These abnormalities trigger metabolic disturbances including dysregulated glucose uptake, increased hepatic glucose output, lipotoxicity, oxidative stress, and chronic low-grade inflammation.

Current evidence from 2024–2025 highlights a growing concern regarding early-onset Type 2 diabetes among young adults and adolescents, particularly in South Asian populations, where genetic predisposition and lifestyle factors interact strongly. Advancements in therapeutics, such as GLP-1 receptor agonists, SGLT2 inhibitors, and dual GIP/GLP-1 agonists, have shown substantial benefits, including improved glycemic control, weight reduction, cardiovascular protection, and renal risk reduction. Continuous glucose monitoring (CGM) and advanced predictive tools have enhanced early detection and personalized treatment strategies.

Despite these advances, challenges remain—especially in ensuring access to modern therapies, controlling rising complications such as diabetic nephropathy and neuropathy, and increasing patient awareness. A deeper understanding of diabetes pathophysiology continues to guide prevention, early diagnosis, and innovative treatment approaches.

Keywords: Diabetes Mellitus, insulin resistance, β-cell dysfunction, hyperglycemia, inflammation

PIET-APSECON-75

In-Silico Identification of Therapeutic Candidates Targeting the PI3K/AKT/mTOR Pathway for Personalized Breast Cancer Treatment

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Abstract

Breast cancer remains a major global health challenge, largely due to its molecular heterogeneity and the variable therapeutic response observed across patients. Among the diverse signaling cascades implicated in tumor development, the **PI3K/AKT/mTOR pathway** plays a critical role in regulating cell growth, metabolism, proliferation, and survival. Dysregulation of this pathway through mechanisms such as **PIK3CA mutations, PTEN loss, or overexpression of upstream receptors like HER2 and EGFR** are frequently observed in aggressive breast cancer subtypes. Such alterations promote uncontrolled cellular growth, resistance to apoptosis, and reduced sensitivity to conventional chemotherapy and hormonal therapies, contributing to poor clinical outcomes.

Various studies have evaluated the potential therapeutic compounds targeting the PI3K (such as Alpelisib)/ AKT (such as Capivasertib)/ mTOR (such as Temsirolimus) pathway using *in-silico* computational approaches. Protein–ligand docking, pathway enrichment analysis, and molecular interaction profiling were employed to screen candidate molecules capable of effectively inhibiting key nodes within the pathway. By simulating drug–target interactions, this approach allows prediction of compound efficacy, specificity, and potential off-target effects prior to in-vitro or in-vivo testing.

The findings highlighted promising inhibitors such as Alpelisib, Capivasertib, Temsirolimus, etc. targeting PI3K, AKT, and mTOR respectively that demonstrate strong binding affinity and therapeutic potential. Such pathway-focused analysis enables the development of **personalized treatment regimens**, offering targeted therapy with improved effectiveness and reduced toxicity. The reports support the integration of computational drug discovery into clinical research pipelines and reinforce the PI3K/AKT/mTOR axis as a valuable therapeutic target in breast cancer management.

Keywords: Breast cancer, *in-silico*, **PI3K/AKT/mTOR pathway,** therapeutic potential, inhibitors.

PIET-APSECON-76

The Therapeutic Potential of Microbial Polysaccharides: Exploring Nanoformulation Strategies

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Abstract:

Microbial-derived polysaccharides are a dynamic family of natural biopolymers with extraordinary structural diversity and multifunctional biological properties. Bacteria, fungi, algae, and yeast produce these macromolecules, which have tremendous therapeutic potential in wound healing, immunomodulation, antibacterial effectiveness, and enhanced drug delivery applications. The incorporation of nanotechnology has increased their biological utility through the development of nanoformulations such as nanoparticles, nanogels, and nanocomposites, which can improve bioavailability, targeted distribution, and therapeutic performance. In view of the growing environmental and health concerns about synthetic polymers, notably the widespread presence of plastic-derived toxins, there is a rapid shift toward sustainable biopolymeric alternatives. Microbial and plant-derived polysaccharides are becoming more well recognized for their biocompatibility, tunable physicochemical qualities, and broad industrial use in the pharmaceutical, food, and biomedical industries.This review focuses on the structural versatility, functional importance, and translational potential of these polysaccharides as next-generation materials that potentially replace traditional synthetic polymers.

Keywords: polysaccharides, nanoformulations, nanocomposites, microbial

PIET-APSECON-77

Non-Alcoholic Fatty Liver Disease: Pathophysiology, Progression and Emerging Therapeutic insights

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Abstract:

Non-alcoholic fatty liver disease (NAFLD) has become one of the most common chronic liver disorders globally, closely linked with rising rates of obesity, insulin resistance, and sedentary lifestyles. Characterized by abnormal triglyceride accumulation in hepatocytes without significant alcohol intake, NAFLD spans a spectrum from simple steatosis to non- alcoholic steatohepatitis (NASH), progressive fibrosis, cirrhosis, and hepatocellular carcinoma. Understanding its pathophysiology is essential for developing effective prevention and treatment strategies.

The "multiple-hit hypothesis" explains NAFLD progression through interactions between insulin resistance, oxidative stress, lipid peroxidation, mitochondrial dysfunction, dysbiosis of gut microbiota, and pro-inflammatory cytokine release. These mechanisms collectively promote hepatocellular injury and fibrosis, increasing risks of liver-related complications and cardiovascular disease.

Recent clinical evidence from 2024–2025 highlights the significant impact of emerging pharmacotherapies. GLP-1 receptor agonists and dual GIP/GLP-1 agonists, such as semaglutide and tirzepatide, have demonstrated substantial reductions in liver fat, improved insulin sensitivity, decreased inflammation, and in many patients, histologic resolution of NASH. Novel agents like resmetirom, targeting hepatic lipid metabolism, have shown meaningful improvements in fibrosis in late-stage trials. While drugs such as

obeticholic acid have presented mixed results and safety concerns, the overall research landscape suggests that pharmacotherapy combined with lifestyle modification can play a crucial role in slowing or reversing NAFLD progression.

Keywords: NAFLD, steatosis, pathophysiology, insulin resistance, oxidative stress, NASH, hepatic fibrosis.

PIET-APSECON-78

Empowering Pharmacists for an AI-Integrated Future

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ABSTRACT

Artificial intelligence (AI) is rapidly transforming healthcare, creating new opportunities for pharmacists to expand their roles and contribute to technology-driven patient care. To leverage AI effectively, the pharmacy workforce must build digital competencies, adopt innovative thinking, and strengthen leadership capacity. This poster highlights the emerging responsibilities of pharmacists in AI-integrated healthcare settings and presents strategies for workforce upskilling, practice innovation, and interdisciplinary collaboration. Using case examples and practical insights, the work emphasizes how pharmacists can act as change leaders, support safe AI implementation, and enhance clinical outcomes. The aim is to guide pharmacy professionals in adapting to technological advancements and thriving in an AI-enabled future.

Keywords:AI-Integrated Healthcare, Digital Health, Interdisciplinary Collaboration, Healthcare Technology,

PIET-APSECON-79

A brief introduction to Pharmacovigilance (PV)

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Abstract

Pharmacovigilance is the science and activities related to understanding, monitoring, detection of adverse drug effects (ADRs) of medicines in humans. This research data has been generated from patient reported data through online ADR forms, electronic health records (EHR), yellow card schemes and biomedical clinical trials. This data will be used for improvement of community health through the use of AI (Artificial intelligence). National Pharmacovigilance program is divided into various zonal, regional and peripheral zones in India, regulated by National Pharmacovigilance Advisory Committee based at Central Drugs Standard Control Organisation (CDSCO). The main objective of these reporting zones is to report ADRs at global level. Currently, Pharmacovigilance Program of India (PVPI) is working with National coordination centre (NCC) for reporting ADRs to Indian Pharmacoepia Commission (IPC), Ghaziabad, UP. Some major challenges of Pharmacovigilance (PV) in India are lack of awareness, shortage of PV inspections, less resources to use new software programs like AI (Artificial intelligence) and Robotics. But Good Pharmacovigilance Practice (GPP) holds the key for future prospects for better clinical research, patient safety and regulatory compliance.

Keywords: Pharmacovigilance (PV), adverse drug effects (ADRs), clinical research

PIET-APSECON-80

The Impact of Real-World Evidence (RWE) on Regulatory Decision-Making

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Abstract

Real-world evidence (RWE) is becoming increasingly important in the global pharmaceutical landscape, especially for supporting regulatory decisions related to the safety and effectiveness of medicines. Traditionally, randomized clinical trials (RCTs) have been considered the gold standard for generating reliable evidence. However, RCTs may not always reflect how medicines perform in everyday clinical settings. As a result, regulatory agencies around the world are showing growing interest in integrating RWE-derived from real-world data (RWD) such as electronic health records, patient registries, and insurance claims-into the drug development and approval process. This study reviews the current global regulatory environment for the use of RWE. It identifies three key elements necessary for its effective application: the presence of regulatory frameworks, guidance on data quality and standards, and clear study-method guidelines. While many countries have begun to develop frameworks and publish guidance documents, the level of acceptance and implementation varies widely. Some nations, such as the United States and several European and Asian countries, have made significant progress, whereas others are still developing foundational structures. Gaps remain in the form of limited harmonization, lack of standardized methodologies, and variation in regulatory expectations. The review highlights opportunities for improvement through international collaboration, shared best practices, and enhanced infrastructure for RWD collection and analysis. Strengthening these areas could accelerate the adoption of RWE in regulatory submissions and support more efficient decision-making. Overall, the findings emphasize that global cooperation and alignment of regulatory approaches are essential to fully realize the potential of RWE in improving public health outcomes and ensuring timely access to effective therapies.

Keywords: Real-world evidence (RWE), Global pharmaceutical landscape, Randomized clinical trials (RCTs), International collaboration

PIET-APSECON-81

An Overview of Plant-Derived Alkaloids and Their Potential Use in Disease Treatment

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Abstract

Alkaloids are significant secondary metabolites released from plants that have both traditional and current medicinal uses due to their powerful pharmacological activity. Their significance in treating complicated diseases, including neurological disorders and cancer, has been brought to light by recent studies. In

neurodegenerative disorders like Alzheimer's, Parkinson's, Huntington's, epilepsy, and schizophrenia, neurones gradually die out. Despite the potential for negative effects, many current treatments just alleviate symptoms. New research indicates that alkaloids originating from plants may offer safer options due to their multi- mechanism action. Isoquinoline, indole, piperidine, pyridine, aporphine, β-carboline, and vinca alkaloids are all included in this group of alkaloids. Inhibition of α-synuclein aggregation, antioxidant action, MAO inhibition, anti-amyloid actions, cholinesterase inhibition, and receptor modulation are some of their activities that aid in

slowing down the progression of disease. Another major therapeutic role that alkaloids play is in cancer therapy. The structural variety of these molecules makes them promising candidates for the development of novel anticancer medications. Recent investigations have demonstrated that some newly discovered alkaloids, including reflexin A, chaetocochin J, neopapillarine, coclaurine, and neferine, have cytotoxic andantiproliferative properties. Ongoing research is aimed at enhancing the transport of plant alkaloids to cancer cells while minimising their impact on healthy tissues, despite the fact that some of these compounds have disadvantages such as poor solubility or bioavailability. Due to their diverse biological activities and promise of safer, multi-target therapeutic alternatives, alkaloids produced from plants continue to play an important role in disease treatment. Better medicines for neurological diseases, cancer, and other serious illnesses may be on the horizon thanks to their ongoing research in pharmacognosy and phytochemistry.

Keywords: Alkaloids, Alzheimer disease, Proliferative, Cytotoxic

PIET-APSECON-82

Utilisation of nanoparticles for intranasal treatment

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Abstract

Their medication delivery techniques have the potential to completely transform the way treatment is provided. Drug transmission from the nostrils to the central nervous system through the intranasal pathway is a single of the most effective techniques of targeted distribution. Curing central nervous system difficulties, such as neurodegenerative diseases, is possible through this technique. Designed for intranasal delivery, these nanoparticles of lipids contain carvedilol. Being a beta-agonist and inhibitor, carvedilol undergoes significant metabolic in its first pass, reducing its systemically bioavailability compared to its unbound state. Enhanced bioavailability of carvedilol by intranasal nanotechnology can be advantageous for CNS treatment. Neuronal polymer nanoparticles delivery to the mind was recently investigated. Utilizing dual emulsion, we were able to create nanoparticles loaded with frovatriptan succinate, which enhanced the trapping of this hydrophilic medication. A separate study looked at the efficacy of airborne diagnosing and protamine in enhancing brain function and systemically circulation. Conscious rabbits showed a surge in the systemic absorption of olanzapine after intranasal administration of chitosan nanoparticles, suggesting that the drug was transferred from the nasal cavity to their mind. Although the nose-to-brain system is physically and biologically unique, there are significant challenges to drug administration via this route. Biological nanoparticle medicine delivery is the result of substantial investigation into nanoparticle-route relations. Although the medical benefits of enhanced drug delivery methods were discussed in this section, there are still many unanswered problems regarding the transport of medication mechanisms, protection, and travel paths.

Keywords- Brain targeting, polymers, frovatriptan, carvedilol, protamine, olanzapine

PIET-APSECON-83

Cancer Treatment and Bio-Regeneration using a Cutting-Edge Drug Transport Nanotechnology

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Abstract:

A typical part of cancer therapy regimens is surgical excision of the tumour. Tumour development is inhibited by chemo and radiation. The handling of outcomes are enhanced by a variety of means. Therapeutic radiation, medication, and surgical procedures all work to limit the spread of cancer cells. The standard of life is diminished by numerous therapies due to their hazardous or major adverse reactions. Nanotechnology is employed in the realm of cancer therapies and drugs. Drug delivery methods that use nanotechnology serve multiple uses. They encompass a wide range of features, such as improved placement, extended circulatory period, managed systemic release, in vivo imaging, and combined drug delivery. Physical obstacles cannot stop the delivery of medications into cells by organic nanosystems that react to stimuli. Cells with cancer produce a highly acidic tumours microenvironment (TME) as a result of their glucose consumption. Drug release from nano-systems is enhanced in tumour settings with an acidic pH. The process by which cancer is treated is always changing. Some more recent methods of chemotherapy include tumour stem cell treatment, the transfer of genes, magnetically drug administration, intracellular medication administration, and ultrasonic drug administration. With few side effects, these medicines specifically kill tumour cells. In order to enhance projections, this overview delves into nano-systems and new techniques of administering chemotherapy drugs. Drug absorption, delivery, or transport advances could be at the heart of these techniques.

Keywords: Chemotherapeutics, cancer stem cell therapy, triggered release, gene delivery, magnetic drug targeting, ultrasound-mediated drug delivery, intracellular drug targeting

PIET-APSECON-84

The Journey of Creating New Medicines: From Lab to Patient

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Abstract

Drug discovery and development is the process of finding new medicines and making sure they are safe and effective for people to use. It starts with scientists learning about diseases and looking for targets in the body, like proteins, that a drug could affect. Researchers then search for chemical compounds that might help. These compounds are tested to find the ones that work best and are least likely to cause harm. Next, the best compounds are studied in the lab and on animals to check for safety and possible side effects. If these tests go well, the drugs are tested on humans through several stages called clinical trials. In these trials, scientists see if the drug works and if it's safe for different groups of people. Before a new can be sold, it must be reviewed and approved by health authorities. Even after approval, the drug is monitored for long-term effects to keep patients safe. New technology is helping scientists find and develop better drugs more quickly, but it still takes many years and a lot of effort to make sure new medicines are safe and helpful.

Keywords: Drug discovery, safety, clinical trials, new medicines, and testing.

PIET-APSECON-85

Quality Control and Quality Assurance

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Abstract:

Quality Control (QC) and Quality Assurance (QA) are integral components of the pharmaceutical quality system, ensuring that every product released to the market is safe, effective, and consistent. QA focuses on establishing a comprehensive framework of policies, procedures, and documentation that governs all stages of drug development and manufacturing. It ensures compliance with Good Manufacturing Practices (GMP), regulatory guidelines, and standard operating procedures (SOPs). QC, on the other hand, involves systematic testing, verification, and analytical evaluation of raw materials, in-process samples, and finished products. Through validated analytical methods, QC confirms that products meet predefined specifications related to identity, purity, potency, sterility, and stability. The interdependence of QA and QC is crucial for maintaining product integrity. QA ensures that each activity is planned, controlled, and documented, while QC provides the empirical data required to verify quality. Together, they support risk management, deviation handling, root-cause analysis, and continuous improvement initiatives. Modern pharmaceutical industries increasingly adopt advanced quality systems such as Quality by Design (QbD), automation, and real-time release testing to enhance reliability and reduce variability. Digital tools, including electronic batch records and integrated quality management systems, further strengthen traceability and compliance. Effective QA and QC not only ensure regulatory approval but also build patient trust by guaranteeing the safety and reliability of medicines. As the industry evolves, the harmonization of global quality standards and adoption of cutting-edge analytical technologies continue to enhance the robustness of pharmaceutical quality systems.

Keywords: Quality Assurance; Quality Control; GMP; Analytical Testing; Pharmaceutical Quality System

PIET-APSECON-86

Role of Digital Empathy and Digital Resilience on Child Socialization: Annoying AI

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Abstract

In today's digital world, the child socialization now extends into cyberspace. As we are in a stage of digital playground, we must identify both the opportunities and the pitfalls. As the technology can be a powerful tool for education, creativity, and connection. However, it can also expose the children to risks such as cyberbullying, internet addiction, and the pressures of social media. As the family members were central part of socialization in the past years. Nowadays, digital technology has arisen as an important equivalent effect on children's standards, behaviours, and emotional development. Families progressively use technology in daily life, and children's interaction and development are shaped by their double role as a foundation of both opportunities and challenges accessible by cyberspace. The current concept is important in child development as the traditional method of communication shifts to online platforms. Digital empathy and digital resilience both form competencies that shape healthy child socialization in an era where home and cyberspace intersect. In current article we will investigates the role of digital empathy and digital resilience in mediating the relationship between family environment and technology use, with the socialization of children in today's society. A sample of 200 children will be collected with an age range of 07-18 years from urban and rural area from Haryana. For significance of data statistics will be applied

.

Key words: Empathy, Digital, Resilience, Socialization, Cyberspace

PIET-APSECON-87

The Future of Health Care: Exploring AI and Robotics in Medicine

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ABSTRACT

Advancements in artificial intelligence and robotics are revolutionizing the healthcare landscape, offering transformative potential in diagnostics, treatment, and patient care. These technologies are enhancing precision, improving efficiency, and reducing human error, making them indispensable tools for modern medicine. AI-driven algorithms support clinicians in interpreting complex medical data, including imaging, pathology, and genomics, with enhanced accuracy and efficiency. Machine-learning models further advance predictive analytics by identifying disease patterns, forecasting patient deterioration, and optimizing treatment pathways. These data-driven systems contribute significantly to precision medicine, allowing interventions to be tailored to individual patient profiles. Robotics complements these innovations by enhancing both clinical and operational workflows. Surgical robots offer high precision, reduced invasiveness, and quicker recovery times, particularly in procedures requiring delicate maneuvers. Rehabilitation robots and assistive devices support physical therapy, improving mobility and patient engagement. Additionally, autonomous service robots help streamline hospital logistics through automated delivery, disinfection, and monitoring tasks, reducing the burden on healthcare personnel. The integration of AI, ML, and robotics also strengthens remote healthcare delivery. Intelligent virtual assistants, tele-robotic systems, and AI-supported telemedicine platforms enhance access to care, particularly in underserved regions. Despite these advantages, challenges such as data privacy, algorithmic bias, interoperability, and the need for rigorous regulatory frameworks remain critical considerations. Overall, the combined application of these technologies is reshaping healthcare by improving diagnostic accuracy, procedural safety, and care efficiency, marking a significant step toward a more responsive and patient-centered healthcare ecosystem.

Keywords: Artificial intelligence, Machine learning, Robotics, Healthcare innovation, Precision medicine

PIET-APSECON-88

Phytochemistry and Pharmacological Application of Capparis Decidua

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Abstract

Capparis Decidua, commonly known as kair is belonging to family Capparidaceae ,gives a phytochemical profile that recognises its importance in pharmaceutical research.In the traditional system of medicine,the bark has been shown to be useful in the treatment of cough, asthma and inflammation;roots used in fever and buds in the treatment of boils In unani, leaves activity as appetizer,helps in cardiac troubles fruit used in biliousness.The plant is reported to contain phytochemical including alkaloids, terpenoids, glycosides and

some fatty acids.In Unani,leaves activity as appetizer, helps in cardiac troubles, used in biliousness;alveolaris and pyorrhea; Root bark is used as anthelmintic and purgative.The plant have significant pharmacological activities like hypercholesterolemia, anti-inflammatory and analgesic, antidiabetic, antimicrobial, antiplaque, antihypertensive, antihelmetic and purgative activities.The review analyses phytochemical and Pharmacological potential of medicinal plant(kair).

Keywords: Capparis Decidua, traditional system of medicine, Alkaloids,Phytoconstituents and Pharmacological activity

PIET-APSECON-89

Role of pharmacovigilance in ensuring post-marketing drug safety

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Abstract

Pharmacovigilance plays a critical role in safeguarding public health by ensuring the continued safety and effectiveness of medicines after they enter the market. While clinical trials provide essential information on a drug's efficacy and short-term safety, they are limited by controlled conditions, relatively small sample sizes, and restricted patient diversity. Once a medication is widely used in real-world settings, previously unrecognized adverse effects may emerge. Pharmacovigilance bridges this gap by systematically collecting, evaluating, and monitoring reports of suspected adverse drug reactions from healthcare professionals, patients, and pharmaceutical companies.

Through continuous surveillance, pharmacovigilance programs help identify rare, delayed, or population-specific side effects that may not have been evident during pre-market testing. These insights support timely regulatory actions such as updating product labels, issuing safety warnings, restricting use, or, in severe cases, withdrawing a drug from the market. In addition, pharmacovigilance contributes to guiding clinicians in making informed treatment decisions, promoting rational drug use, and improving patient outcomes.

Modern pharmacovigilance increasingly incorporates advanced data analysis methods, including electronic health records, digital reporting systems, and artificial intelligence, allowing for faster detection of safety signals. Public involvement has also grown, empowering patients to report their experiences and enhancing the overall safety net.

In essence, pharmacovigilance is a dynamic and essential component of the healthcare system. It ensures that the benefits of medicines continue to outweigh their risks throughout their lifecycle, reinforcing trust in therapeutic products and ultimately protecting population health.

Keywords|: Pharmacovigilance,restricted patient diversity,pre-market testing,digital reporting system and therapeutic products.

PIET-APSECON-90

AI-Driven Drug Design and Development

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ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative force in modern pharmaceutical research, significantly accelerating and refining the drug design and development process. Traditional drug discovery is often slow, costly, and prone to high failure rates, requiring extensive experimentation and long development timelines. AI-driven approaches address these challenges by integrating advanced algorithms, machine learning techniques, and large-scale biomedical data to improve efficiency and precision at every stage of drug development. In the early discovery phase, AI assists in identifying and validating promising drug targets by analyzing complex datasets derived from genomics, proteomics, and disease biology. Machine learning models enable rapid virtual screening and hit identification by predicting the binding affinity and biological activity of millions of compounds without extensive laboratory testing. Additionally, deep learning and generative models facilitate de novo drug design, creating novel, optimized molecules with desirable pharmacological properties. AI also plays a critical role in preclinical and clinical development by predicting ADMET (Absorption, Distribution, Metabolism, Excretion, and Toxicity) profiles, thereby reducing drug failure due to safety concerns. In clinical trials, AI supports patient selection, dose optimization, and real-time monitoring, leading to more efficient and targeted study designs. Another promising application is AI-driven drug repurposing, which identifies new therapeutic uses for existing drugs, significantly shortening development timelines and reducing costs. Despite its immense potential, challenges such as data quality, algorithmic bias, regulatory acceptance, and integration with experimental workflows remain. Overall, AI-driven drug design represents a major advancement in pharmaceutical innovation, offering faster, more cost-effective, and more precise solutions for developing next-generation therapeutics.

Keywords: Artificial Intelligence (AI), Target Identification, De Novo Drug Design, ADMET Prediction, Machine learning models

PIET-APSECON-91

Emerging Trends In Artificial Intelligence For Sustainable Healthcare Systems

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Abstract:

Artificial Intelligence (AI) is becoming an essential component of modern healthcare systems by improving the accuracy, efficiency, and accessibility of medical services. AI technologies, including machine learning algorithms, natural language processing, and computer vision, support healthcare professionals in diagnosing diseases, predicting health risks, and planning appropriate treatments. These systems are capable of analyzing large volumes of medical data such as patient records, imaging reports, and laboratory results at high speed, enabling faster and more reliable clinical decisions. AI also plays a significant role in medical imaging by assisting in the detection of abnormalities such as tumors, fractures, and infections, which enhances diagnostic precision. In addition, AI-powered tools are increasingly used in personalized medicine to design treatment plans based on individual patient characteristics, leading to better outcomes and reduced side effects. Virtual health assistants and chatbots further improve patient engagement by providing health information, medication reminders, and appointment scheduling support. Moreover, AI contributes to hospital management by optimizing resource allocation, improving workflow efficiency, and reducing operational costs. Despite its advantages, challenges such as data privacy concerns, ethical issues, and the need for skilled professionals remain major barriers to its widespread adoption. Overall, AI has the potential to transform healthcare delivery by promoting early diagnosis, enhancing treatment quality, and improving patient satisfaction when integrated responsibly and effectively.

Keywords: Artificial Intelligence, Healthcare innovation, AI trends, Health tech, Medical Imaging

PIET-APSECON-92

Hinokitiol For Management Of Diabetes Mellitus

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Abstract

Hinokitiol (β-thujaplicin), a naturally occurring tropolone derivative present in Chamaecyparis and Thujopsis species, has surfaced as a potentially bioactive chemical that has possible therapeutic significance in the treatment of diabetes mellitus. As diabetes rises worldwide, natural compounds that target several metabolic pathways are in demand. Hinokitiol demonstrates potent antioxidant, anti-inflammatory, and metal-chelating capabilities, positioning it as a versatile candidate for addressing metabolic dysfunctions generated by hyperglycaemia. Preclinical studies indicate that hinokitiol improves insulin sensitivity by modulating essential molecular pathways, including AMPK activation, which promotes glucose absorption and diminishes hepatic gluconeogenesis. Moreover, hinokitiol mitigates chronic inflammation and oxidative stress—two critical factors in the initiation and advancement of insulin resistance and pancreatic β-cell impairment.

Hinokitiol demonstrates protective benefits in pancreatic β-cells by alleviating oxidative damage generated by high glucose, maintaining cell viability, and enhancing insulin production. New research reveals that hinokitiol improves lipid metabolism, adipose inflammation, and gut microbiota composition, which improves glycaemic management.

Beyond glucose management, hinokitiol may avoid diabetes complications. It prevents chronic hyperglycaemia-related endothelial dysfunction, neuronal damage, and renal fibrosis with its vasoprotective, neuroprotective, and renoprotective characteristics.

Although present findings are encouraging, the majority of data stem from in vitro and animal studies, underscoring the necessity for controlled clinical trials to validate safety, efficacy, appropriate dose, and long-term therapeutic advantages in people. Hinokitiol is a promising natural option for the development of supplemental or adjunct medicines in diabetes control, owing to its extensive biological activity.

Keywords: Hinokitiol, Diabetes Mellitus, AMPK Pathway, Oxidative Stress, Insulin Sensitivity

PIET-APSECON-93

Glycerosomes: A Next-Generation Nanocarrier for Enhanced Sun Protection and Photoprotection

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Abstract:

Glycerosomes are robust vesicular nanocarrier system with great potential for photoprotection and sun protection. Glycerosomes are structurally identical to liposomes but supplemented with high quantities of glycerol, thus have better membrane flexibility, skin penetration, and biocompatibility, allowing for effective topical distribution of UV-protective agents. Because of its extremely pliable bilayer, UV filters, antioxidants, and herbal photoprotective substances, they are retained longer in the stratum corneum and epidermis. Glycerosomes enhance the sun protection factor (SPF) by encouraging deeper penetration, continuous release and lowers the irritation that synthetic sunscreen actives frequently cause. Furthermore, during UV exposure, glycerol's humectant properties help with hydration, barrier restoration, and calming effects. According to recent studies, glycerosomes offer a multimodal approach to skin protection by reducing UV-induced oxidative stress, inflammation, collagen breakdown, and photo aging. Additionally, glycerosome loaded formulations efficiently transport therapeutic and antioxidant compounds and exhibits strong resistance against UV-induced oxidative stress, inflammation, DNA damage, collagen degradation, hyperpigmentation, and photoaging. Their biocompatibility, transparency, and non-greasy texture contribute to improved elegance and customer compliance. All things considered, glycerosome-based sunscreen formulations present a viable, secure, and user-friendly alternative to next-generation nanocosmeceuticals for UV protection

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Keywords: Glycerosomes, Sun protection, Photoprotection, Skin permeation, Antioxidants

PIET-APSECON-94

Phytosomes: A Promising Platform for Enhanced Cancer Therapeutics

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Abstract:

Cancer contributes to one of the major worldwide health concerns, demanding continuous research for novel therapeutic approaches. The limited efficacy and severe adverse effects of conventional treatment strategies has driven demand in plant-based anticancer drugs. Despite the fact that many phytochemicals have great therapeutic potential but due to its poor solubility, instability, rapid metabolism, and low bioavailability frequently impede their clinical utility. Phytosomes have emerged as a novel strategy offering a unique approach by forming stable complexes between phytoconstituents and phospholipids. This configuration improves pharmacokinetic characteristics, increases membrane permeability, and makes it possible for phytochemicals to be delivered to tumor tissues more effectively. By encouraging improved stability and sustained release, phytosomes assist sustain therapeutic concentrations of phytochemicals for extended periods of time while reducing undesirable side effects. In addition to supporting increased selectivity toward cancer cells, the enhanced transport of bioactive substances via phytosomes lowers the risk of systemic toxicity. Phytosomes are an advantageous tool for the development of supportive and targeted cancer therapies due to their biocompatibility and capacity to improve the pharmacological effect of natural compounds. Phytosomes can enhance antiproliferative and pro-apoptotic responses while reducing toxicity to healthy tissues by increasing bioavailability, stabilizing active components, and enabling targeted interaction with cancer-specific molecular pathways. These attributes collectively make phytosomes a significant delivery system for development of safer, more effacious, and clinically applicable treatment approaches in cancer.

Keywords: Phytosomes, Cancer therapy, Targeted Drug Delivery, Anticancer activity, Bioavailability enhancement

PIET-APSECON-95

Transethosomes: An Emerging Nanocarrier Based Method for the Effective Improvement of *Acne vulgaris*

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Abstract:

Acne vulgaris is a chronic inflammatory condition in which pilosebaceous units – hair follicles, sebaceous gland and arrector pili muscle are blocked and inflamed which results in comedones, papules, pustules, nodules and cysts can develop. It is mainly characterised by inflammation which is brought on by Cutibacterium acnes colonization, hyperkeratinization, and hypersecretion of sebum. Conventional acne treatments have drawbacks - poor skin penetration, local irritation, antimicrobial resistance, and inadequate medication delivery to the deeper layers of the skin, despite the variety of therapeutic alternatives available. One of the most promising nanocarrier-based delivery systems to get beyond the drawbacks of traditional acne treatments is transethosomes. Phospholipids, ethanol, and surfactants combine to generate ultra-deformable, flexible carriers in these vesicular systems that may effectively cross the stratum corneum barrier. Because of their deformability, bioactive chemicals can be delivered deeper into the pilosebaceous units, the main location of acne pathogenesis, through the skin's small intercellular channels. Small vesicular size, entrapment effectiveness, improved skin penetration and outstanding biocompatibility makes it easier for them to pass through the skin barrier. These characteristics help with focused localization, controlled release, and enhanced medication stability. Because of these advantageous characteristics, transethosomes are regarded as a very successful and novel approach to the treatment of acne, providing better therapeutic results and less side effects than conventional topical preparations.

Keywords: Acne vulgaris, Ursolic acid, Transethosomes, Skin permeation, Nanocarrier

PIET-APSECON-96

Unravelling the Therapeutic Potential of *Spirulina fusiformis* in Diabetic Peripheral Neuropathy

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Abstract

Spirulina fusiformis is a spiral-shaped cyanobacterium recognized for its strong antioxidant, anti-inflammatory, immunomodulatory, and neuroprotective properties. This study investigated the phytochemical profile, antioxidant activity, and neuroprotective potential of its aqueous (AQE) and hydroethanolic (HEE) extracts. Both extracts were prepared by maceration and evaluated through phytochemical screening, DPPH assay, GC–MS metabolic profiling, and MTT-based cytoprotection studies in RSC96 Schwann cells exposed to hyperglycemic stress.

Phytochemical analysis confirmed the presence of alkaloids, terpenoids, flavonoids, glycosides, saponins, phenols, proteins, and amino acids. The hydroethanolic extract exhibited nearly double the DPPH radical scavenging capacity of the aqueous extract, highlighting its stronger antioxidant activity. GC–MS identified 64 metabolites across both extracts, including oxoproline, niacin, putrescine, acubine, N-acetyl-L-glutamic acid, leucine, several fatty acids, and glutamic acid—compounds linked to neuroprotection and glucose regulation. In vitro studies further demonstrated enhanced Schwann cell viability at lower concentrations of both extracts, indicating significant cytoprotective effects under hyperglycemic conditions.

Overall, *Spirulina fusiformis* contains a rich spectrum of bioactive molecules and shows noteworthy antioxidant and neuroprotective activity, with the hydroethanolic extract offering superior efficacy. These findings support its potential as a nutraceutical for mitigating diabetes-induced hyperglycemic neurotoxicity.

Keyword: Spirulina fusiformis, Antioxidant activity, Anti-inflammatory properties, MTT cytoprotection assay, Nutraceutical potential

PIET-APSECON-97

AI framework for precise Orthopox virus detection and the diagnosis of Monkeypox infection

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Abstract

Early and accurate identification of Orthopoxvirus infections is critical due to their clinical similarity to other pox-like viral diseases. This study presents an advanced artificial intelligence–based framework for reliable Orthopoxvirus detection using skin lesion images. The developed model integrates ResNet-50–Zero Component Analysis (ZCA) feature extraction to reduce redundancy and enhance lesion-specific representations through ZCA-whitening. Principal Component Analysis (PCA) is employed for feature fusion, enabling more compact and informative representations. For classification, a Modified XGBoost algorithm optimized with a statistical loss function is introduced to reduce overfitting and strengthen generalizability. Using a publicly available dataset comprising monkeypox (MPX), smallpox, chickenpox, and other viral lesions, the model achieved 97.41% accuracy, 97% recall, and 98% precision, significantly surpassing existing deep learning and ensemble methods. These results highlight the effectiveness of artificial intelligence in Orthopoxvirus detection and its promising role as a robust decision-support tool for clinical and epidemiological applications. The Indian Pharmacopoeia Commission (IPC) plays a pivotal role in enhancing the country's diagnostic readiness. By ensuring the quality, regulatory compliance, and reliability of diagnostic tools used across India, IPC strengthens national health systems. Through rigorous, evidence-based evaluations and by encouraging the adoption of modern technologies, IPC also supports the seamless integration of dependable AI-based MPX diagnostic solutions into the public health framework.

Keywords: Orthopoxvirus; Artificial Intelligence; Lesions; Early Detection; Public Health

PIET-APSECON-98

Healing Nerves Naturally: Herbal Approach to Diabetic Neuropathy

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Abstract

Diabetic neuropathy is among the most prevalent chronic complications of type 1 and 2 diabetes mellitus. It is a chronic, progressive nerve disorder caused by long-standing hyperglycemia, leading to damage of peripheral, autonomic, or focal nerves, resulting in sensory loss, pain, or motor dysfunction and is a primary cause of foot ulcers and lower limb amputations in diabetic patients. The pathogenesis of diabetic neuropathy is multifunctional resulting in oxidative stress, mitochondrial dysfunction, inflammation, and microvascular damage. Hyperglycemia, dyslipidemia, and installing resistance activate various metabolic pathways. Different types of pathways are Polyol pathway, AGE pathway, Protein kinase pathway, Hexosamine pathway, Inflammatory pathway, ROS pathway. Even though there are many therapies and drugs available-in the market to treat diabetic neuropathy, but the drawbacks aspects of these drugs, like inadequate pharmacokinetics, cost and drug resistance make a shift necessary from these chemical treatments towards the herbal drugs as medication. For this treatment herbal drugs like *Ocimum sanctum* (Tulsi), *Curcuma longa* (Turmeric), *Withania somnifera* (Ashwagandha), *Ginkgo biloba* (Maidenhair tree), *Tinospora cordifolia* (Giloy), *Panax ginseng* (Ginseng), *Allium sativum* (Garlic), and *Cinnamomum verum* (Cinnamon) act as boons for diabetic neuropathy by reducing oxidative stress, improving nerve blood flow, regenerating neurons, decreasing inflammation, and improving glycemic control.

Keywords: Polyol pathway, Diabetic neuropathy, Hyperglycaemia, Herbals, Hexosamine pathway, Schwann cells

PIET-APSECON-99

Chronotherapy in Modern Pharmacy Practice: Enhancing Medication Safety and Efficacy at the Bedside

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Abstract

Chronotherapy is the strategic timing of medication administration according to the body's circadian rhythms-has emerged as a vital component of precision therapeutics. As physiological processes such as hormone secretion, enzymatic activity, and receptor responsiveness fluctuate over the 24-hour cycle, these rhythms significantly influence drug absorption, metabolism, distribution, and pharmacodynamic response. Modern pharmacy practice is uniquely positioned to translate this chronopharmacological knowledge into clinical benefit. By guiding optimal dosing schedules, monitoring circadian-dependent disease patterns, and educating patients on time-sensitive therapies, pharmacists play a critical role in improving medication safety and therapeutic efficacy at the bedside. Integrating chronotherapy into routine care not only enhances treatment outcomes for conditions such as hypertension, asthma, cancer, and metabolic disorders, but also minimizes adverse effects and promotes individualized care. As healthcare increasingly embraces personalized medicine, chronotherapy represents a transformative approach that empowers pharmacists to optimize drug therapy and advance patient-centered outcomes.

Keywords: Chronotherapy, Circadian Rhythms, Pharmacy Practice, Medication Safety, Therapeutic Efficacy.

PIET-APSECON-100

Integrating Nanotechnology with Terminalia arjuna : Therapy for the Management of Coronary Artery Disease

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Abstract

Aim:
Coronary artery diseases including angina pectoris and myocardial infarction, pose significant global health challenges. This study aims to explore the cardioprotective role of *Terminalia arjuna* (T. arjuna) and highlight the advancements in nanotechnology-based drug delivery systems that enhance its therapeutic potential.

Methods:
A comprehensive review of pharmacological studies was undertaken to evaluate the phytoconstituents of *T. arjuna* and their cardioprotective mechanisms. The focus was placed on bioactive compounds such as tannins, alkaloids, flavonoids (quercitin), ferulic acid, and anthraquinones and their role in hypolipidemic, antioxidant and anti-ischemic activities. In addition, recent literature on green nanotechnology approaches, including nanoparticle encapsulation, liposomal formulations and polymeric carriers, was analysed for their ability to improve extract stability and bioavailability.

Results:
Extracts of *T. arjuna* demonstrated significant cardioprotective effects by reducing oxidative stress, modulating lipid profiles, and preventing ischemic damage. Encapsulation of *T. arjuna* in nanocarriers enhanced solubility, stability, targeted delivery and sustained release of active phytoconstituents. Studies reported improved therapeutic efficacy and reduced dosing frequency when nanotechnology-based systems were employed.

Conclusion:
Terminalia arjuna holds strong promise as a natural cardioprotective agent. Integration with nanotechnology-based delivery platforms significantly enhances its bioavailability and clinical potential. Future translational research and clinical studies are warranted to establish *T. arjuna*loaded nanocarriers as an effective adjunct therapy for cardiovascular diseases.

Keywords: *Terminalia arjuna*, cardioprotection, phytoconstituents, cardiovascular disease, nanotechnology drug delivery.

PIET-APSECON-101

Role Of Ai In Drug Repurposing

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Abstract:

Artificial intelligence (AI) has rapidly transformed the landscape of drug repurposing, offering unprecedented speed and precision in identifying new therapeutic uses for existing drugs—an advancement especially valuable for rare diseases and neglected tropical diseases (NTDs). Traditional repurposing approaches rely heavily on manual literature curation, serendipity, or isolated experimental screening, which are time-consuming and limited in scope. AI-driven models overcome these challenges by integrating diverse datasets, including genomics, transcriptomics, chemical structures, protein–drug interactions, and clinical records. Machine learning algorithms, deep neural networks, and knowledge-graph platforms can uncover hidden drug–disease relationships, predict mechanistic overlap, and prioritise candidates with high therapeutic potential. For ultra-rare and genetically complex disorders, AI supports precision repurposing by matching disease-specific molecular signatures with drug-induced signatures from resources like LINCS/CMap. Similarly, in NTDs, AI accelerates the search for compounds that target parasite biology or modulate host pathways critical for infection control.

AI also enhances success rates by reducing false leads and shrinking the experimental search space. Recent advances in high-content phenotypic screening, guided by AI-based hit prediction, enable rapid validation in patient-derived models. Although challenges remain—such as data inconsistency, limited patient samples, and translational gaps—AI is reshaping drug repurposing into a more systematic, efficient, and scalable strategy. Its continued integration promises faster therapeutic discovery, improved global health impact, and equitable access to treatments for underserved populations.

Keywords: Artificial intelligence (AI); Drug repurposing; Rare diseases; Neglected tropical diseases (NTDs); Computational drug discovery; Multi-omics integration; Genomics and transcriptomics; Connectivity Map (CMap); LINCS database; Phenotypic screening; Target prediction; Global health.

PIET-APSECON-102

Artificial Intelligence in Pharmacovigilance – From Signal Detection to Safer Medicine

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Abstract:-

Artificial intelligence (AI) is reshaping pharmacovigilance (PV) by enabling faster, broader, and more sensitive detection of adverse drug events (ADEs) across multiple data sources. Leveraging natural language processing (NLP), machine learning (ML), and knowledge-graph methods, AI systems can automatically extract safety signals from unstructured text (clinical notes, spontaneous reports, social media) and structured real-world data (EHRs, claims), reducing manual curation burden and accelerating signal triage. AI-driven pipelines combine feature engineering, representation learning, and probabilistic ranking to prioritize candidate signals for expert review, improving early identification of rare or unexpected drug safety issues that traditional methods might miss. Recent scoping and narrative reviews report promising gains in sensitivity and throughput, particularly when AI is applied to integrated structured and unstructured datasets and validated with targeted phenotypic screening or chart review. However, real-world deployment faces barriers: dataset fragmentation and bias, variable labelling quality, limited explainability of complex models, and regulatory and privacy constraints. To be clinically useful and acceptable to regulators, AI in PV must be validated with transparent performance metrics, calibrated to reduce false positives, and embedded within human-in-the-loop workflows that preserve expert oversight. With appropriate governance, explainability, and data governance, AI offers a scalable, cost-effective means to augment traditional PV systems — enabling earlier detection, more precise risk stratification, and improved patient safety globally.

Keywords: Pharmacovigilance, AI in Pharmacovigilance, Natural language processing, Electronic Health Records, Adverse drug events, Drug safety.

PIET-APSECON-103

Title: Enhancing the Therapeutic Potential of Neuroprotective Compounds Through Intranasal Co-Delivery with Vitamin B6: A Synergistic Approach for Epilepsy Management

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Abstract: Epilepsy is a chronic neurological disorder characterized by recurrent seizures and progressive neuronal vulnerability driven by oxidative stress, neuroinflammation, excitotoxicity, and impaired GABAergic transmission. Recent insights suggest that these limitations can be significantly overcome when such compounds are **co-delivered with Vitamin B6**, an essential cofactor involved in γ-aminobutyric acid (GABA) synthesis and neuronal metabolic regulation. This review explores the concept that the **therapeutic potential of a neuroprotective compound can be markedly enhanced through intranasal co-delivery with Vitamin B6**, resulting in a synergistic, multi-targeted approach to seizure management. Intranasal delivery offers a non-invasive, efficient route that bypasses hepatic first-pass metabolism and facilitates direct nose-to-brain transport, thereby improving the central bioavailability of both agents. Vitamin B6 augments inhibitory neurotransmission by supporting optimal GABA synthesis, while the accompanying neuroprotective compound attenuates oxidative damage, suppresses neuroinflammation, modulates mitochondrial function, and reduces neuronal hyperexcitability. Together, these complementary mechanisms broaden the therapeutic scope and create a more robust neuroprotective environment within the brain. The review synthesizes current mechanistic evidence, preclinical findings, and emerging pharmacological insights supporting this co-delivery strategy. Overall, the intranasal co-administration of Vitamin B6 with a neuroprotective compound represents a promising and innovative therapeutic approach that holds the potential to enhance seizure control, protect against long-term neuronal damage, and improve clinical outcomes for individuals living with epilepsy.

Keywords: Vitamin B6, Synergistic therapy, Intranasal delivery, Epilepsy, Brain targeting

PIET-APSECON-104

Double Network Hydrogels: A Promising Biomaterial Advancement in Oncology

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Abstract

Cancer is a complex, multifactorial disease characterized by the uncontrolled proliferation of abnormal cells that fail to regulate replication and resist normal growth signals. Globally, it accounts for approximately 19 million new cases and 10 million deaths annually, ranking as the second leading cause of mortality. Its etiology spans genetic inheritance, lifestyle factors, chronic exposure to hazardous chemicals, and oncogenic viral infections. Conventional therapeutic modalities—including surgery, radiotherapy, and chemotherapy—remain the clinical mainstay but are limited by systemic toxicity and collateral damage to healthy proliferating cells. Chemotherapy, for instance, induces peripheral neuropathy, cognitive impairment, and alopecia, while radiotherapy exposes non-target tissues to ionizing radiation.

Recent advances in biomaterials have introduced **double network (DN) hydrogels** as a promising alternative in oncological treatment. These hydrogels exhibit unique physicochemical properties, including high mechanical strength and adsorption capacity, derived from their crosslinked dual-network architecture. These hydrogels can quickly induce cancer cells to exhibit stem-like traits reflecting their potential to influence recurrence-driving cancer stem cells pathways. Their ability to provide **controlled, sustained, and localized drug release** minimizes systemic exposure and reduces adverse effects. DN hydrogels can be injected directly into tumor sites, encapsulating anticancer agents for gradual in situ release, thereby avoiding widespread cytotoxicity and mitigating side effects such as nausea, hair loss, and neurocognitive decline.

This emerging therapeutic platform represents a **breakthrough in oncology**, offering a biocompatible, site-specific, and mechanically robust drug delivery system. By overcoming the limitations of conventional radiotherapy and chemotherapy, DN hydrogels hold significant potential to transform cancer treatment paradigms, enhancing efficacy while preserving patient quality of life.

Keyword: Cancer, Conventional therapies, Surgery, Double network (DN) hydrogels, Oncology therapeutic innovation

PIET-APSECON-105

Generative AI Models for De-Novo Drug Design and Molecular Innovation

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Abstract:

Generative artificial intelligence (AI) is rapidly transforming de-novo drug design and molecular innovation by enabling the efficient creation of novel chemical structures with desirable pharmacological and physicochemical attributes. Using advanced deep learning frameworks such as variational autoencoders (VAEs), generative adversarial networks (GANs), normalizing flow models, and transformer-driven molecular language models these systems can capture intricate structure property relationships embedded in large chemical datasets. As a result, generative AI accelerates the exploration of chemical space and can propose candidate molecules optimized for multiple objectives, including binding affinity, ADMET behavior, and practical synthetic accessibility. One of the major strengths of generative AI is its ability to incorporate structural biology insights, particularly 3D protein ligand interaction data, into an iterative design workflow. Through reinforcement learning and structure-based scoring strategies, these models enhance hit discovery, lead optimization, and scaffold diversification while significantly reducing the time and cost associated with experimental screening. Generative models also support inverse design, where desired molecular properties guide the automated generation of compatible chemical structures. Additional capabilities such as docking-informed generation, retrosynthesis prediction, and multimodal modeling that integrates chemical, biological, and omics information further broaden their applicability across diverse therapeutic domains. Despite these advances, several challenges persist, including maintaining chemical realism, improving the interpretability of model outputs, mitigating dataset biases, and validating AI-generated compounds through rigorous in-vitro and in-vivo experimentation. Ethical and regulatory issues also need careful consideration as AI-designed molecules move toward clinical evaluation. Overall, generative AI offers a groundbreaking pathway for molecular discovery, promising faster, more efficient, and more innovative drug development.

Keywords: Generative AI, De-novo drug design, Molecular innovation, Deep learning, Drug discovery

PIET-APSECON-106

"The Role of Artificial Intelligence in Modern Pharmacy Practice"

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Abstract

By improving productivity, precision, and patient-centered care, computational intelligence (AI) is revolutionizing the pharmaceutical industry. Artificial intelligence, deep learning, NLP, and statistical analysis are some of the artificial intelligence-powered technologies that are currently supporting a wide range of pharmaceutical activities. Through the analysis of complicated biological data, AI shortens the time and money needed to discover new therapeutic compounds in the drug discovery process. Predicting pharmacological responses, optimizing dosage, and identifying possible side effects all contribute to better experimental and clinical studies design.

By automating quality monitoring, defect detection, and production uniformity, AI improves pharmaceutical manufacturing's accuracy. Smart dispensing systems, clinical decision-support systems, and tools for pharmaceutical treatment management are all ways in which artificial intelligence is improving the pharmacy profession and helping pharmacists provide better, safer care to their patients. The use of chatbots, virtual assistants, and mobile health technologies powered by artificial intelligence can greatly enhance patient counselling and adherence. Treatments can be customized according to an individual's genetics and clinical characteristics through personalized medicine, which is aided by AI algorithms. Artificial intelligence also improves pharmacovigilance by sifting through massive datasets for mentions of adverse medication reactions. Many obstacles persist, including concerns about data privacy, ethical issues, expensive deployment, and a lack of trained personnel, despite the many benefits. When it comes to the future of pharmacy, artificial intelligence will be crucial in bringing innovation, patient safety, and better health outcomes together.

Keyword: Artificial Intelligence, Drug Discovery, Pharmacovigilance, Chatbots

PIET-APSECON-107

Role of AI and machine learning in health care

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Abstract:

AI, machine learning, and robotics are transforming healthcare research by allowing for advanced diagnoses, tailored medication, and better patient outcomes through tasks such as medical image analysis, drug development, and robotic surgery. These technologies aid in the analysis of complicated data, the automation of repetitive operations, and the provision of more accurate and efficient treatment; yet, they also raise concerns about data privacy, bias, and ethical implementation. The development of personalized medicine, a paradigm that customizes medical care to each patient's unique features, has been accelerated by the use of AI in healthcare.

Artificial intelligence (AI) advances nanosystem in healthcare (HEA) by maximizing their design, execution, and clinical use, particularly in diagnostics, drug administration, and personalized medical care.

Target Identification: AI algorithms examine extensive biological data sets (such as genomics, proteomics, and medical records) to discover new disease targets and forecast which targets are most likely to respond to a new medication.

Drug repurposing identifies new therapeutic uses for the existing drugs originally developed for different indications, aiming at capitalizing on the established safety and efficacy profiles of known drugs. AI-driven modeling and computational approaches allow for the rapid evaluation of large compound libraries and the identification of potential drug candidates without extensive laboratory work, thereby significantly reducing the time and financial investment required in the initial stages of drug development.

AI-driven tools enhance the prediction accuracy of absorption, distribution, metabolism, and excretion profiles, identify transporter interactions, and even simulate metabolic pathways. Additionally, modern formulation technologies, such as three-dimensional printing, lipid-based nano-carriers, and biodegradable delivery systems, are increasingly being integrated with AI-powered design platforms to personalize and optimize drug delivery.

Keywords: Medical image analysis, drug development, robotic surgery, personalized medicine, drug administration, genomics, proteomics, drug repurposing.

PIET-APSECON-108

Emerging Technologies for the Detection and Standardization of Cannabidiol in CBD oil

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Abstract

The global cannabidiol (CBD) oil industry is experiencing exponential growth, driven by its therapeutic potential in pain management, anxiety, and inflammation. However, this expansion has also led to increased scrutiny regarding product quality, safety, and regulatory compliance. Accurate detection and standardization of CBD content are essential, particularly as many commercial products suffer from label inaccuracies, contamination, and inconsistencies. Conventional separation methodologies such as ultra-performance liquid chromatography (UPLC) and gas-phase chromatography coupled with mass spectrometry (GC-MS) persist as benchmark methodologies owing to their exceptional detection capabilities and selectivity. Approaches including plasmon-enhanced Raman spectrometry (PERS) and short-wavelength infrared (SWIR) spectrometry hold particular potential for preserving sample integrity during instantaneous examination. Furthermore, computational approaches like artificial neural networks (ANNs) and pattern recognition algorithms are being incorporated into analytical systems to augment information processing and outcome forecasting accuracy. Blockchain technologies and in-line process monitoring further support traceability and product integrity. This review provides a comprehensive evaluation of both conventional and novel detection technologies, comparing their applicability, performance metrics, and standardization potential in the evolving CBD market landscape.

Keywords: Cannabidiol detection, CBD oil standardization, emerging technologies, chromatographic methods, spectroscopic sensors.

PIET-APSECON-109

Traditional Medicine To The Modern Era Of Synthetic Pharmaceuticals

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Abstract

Traditional medicine is a "Holistic" on "Herbal" therapy. It is based integrating emotional, mental and experience of indigenous people from different culture. The traditional medicine (Chinese, Ayurveda, Herbal etc) that we achieved in last decades and which is adapted by who (world Health organization) Assembly Certain herbal remedies which one misuse and cause harm . The Examination of better design research is the safety concern for traditional medicine maximums 80% of population of Asian and African countries depend on traditional system for their primary health care. There are alot of medicinal plant which contain antioxidant activity. The pharmacological result and toxicology of various herbal product on the market have not been thoroughly tested. Researches across a variety of disciplines have taken private data public domain using synthetic data. Synthic medicine are that medicine which was man-made Chemical compound which is design to mimic with biological process in the body. These medicines are used to prevent or treat various diseases .It have high potency and specificity which have quality and purity but potency for side effect and interactions of synthetic medicine

Keywords: WHO, Holistic, Herbal, Toxicology and pharmacology

PIET-APSECON-110

Curriculum of regulatory affairs in pharmacy

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Abstract

The quality of pharmaceutical product which ensure the safety, efficacy and purity of pharmaceutical product is control by regulatory affairs and it have a crucial role . The new product or change to existing product have been approved by regulatory affairs and GMP (Good Manufacturing Practices are ensure by regulatory affairs . It ensure the public health safe and effective pharmaceutical product . Legal aspect of pharmaceutical including liability and intellectual property . Agencies such as CDSCO, FDA, EMA and WHO are coordinate with regulatory professionals which is supported to prepare review and submit document . The discipline also cover the regulation of medicinal device, vaccines and cosmetics . It cover the entire drug cycle which include pre-clinical testing , labelling , export-import regulation . The course of regulatory affairs in India The course of regulatory affairs in India have hugs amount of college and university. A regulatory affair professional play a very important part in coordinating scientific undertaking keep in touch with international legislation guidelines and customer practices, monitor the progress of a registration submission. Managing review audit report and regulatory customer inspection . Respond to the quarries as they arise and answer that registration granted without delay

.

Keywords: GMP, CDSCO, FDA, EMA, WHO

PIET-APSECON-111

Phytopharmaceuticals: Role of Herbal Drugs in Disease Management":

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Abstract

Phytopharmaceuticals have emerged as a significant component of contemporary therapeutic strategies, bridging traditional herbal medicine and modern evidence-based pharmacotherapy.With a growing global emphasis on safer, more sustainable, and biologically compatible treatments, herbal drugs have demonstrated promising potential in the management of a wide spectrum of diseases. These plant-derived bioactive compounds exhibit multifaceted pharmacological activities—including anti-inflammatory, antioxidant, immunomodulatory, antimicrobial, antidiabetic, and anticancer effects—thereby offering holistic and targeted therapeutic benefits. Advances in analytical chemistry, nanotechnology, and biotechnology have refined phytoconstituent isolation, standardization, and formulation, enabling higher efficacy, improved stability, and enhanced bioavailability compared to conventional crude extracts. Recent research has elucidated the mechanisms by which phytopharmaceuticals modulate molecular pathways involved in oxidative stress, chronic inflammation, metabolic dysregulation, and cellular proliferation. Additionally, integration with modern delivery platforms such as nanoparticles, liposomes, phytosomes, and sustained-release systems has further improved therapeutic outcomes. Herbal drugs are increasingly being incorporated into complementary and integrative medicine frameworks, particularly in chronic disease management, where long-term safety and reduced adverse effects are essential. Despite these advances, challenges persist in the areas of regulatory harmonization, standardization, quality control, and large-scale clinical validation. Addressing these limitations is crucial for ensuring consistent efficacy and global acceptance of phytopharmaceutical products innovation.

Keywords: Herbal, Anti inflammatory, phytosomes, Bioavalibality, Nanoparticles .

PIET-APSECON-112

Enhancing Beauty: The Role of Aesthetic Products in the Modern Era":

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Abstract

The modern beauty landscape has undergone a profound transformation driven by scientific innovation, consumer awareness, and the integration of dermatological insights into cosmetic development. Aesthetic products—encompassing skincare formulations, cosmeceuticals, hair care, and minimally invasive aesthetic enhancements—play a pivotal role in promoting skin health, restoring youthful appearance, and improving overall well-being. With advancements in biotechnology, nanotechnology, and ingredient engineering, contemporary aesthetic products now offer targeted therapeutic benefits that extend beyond surface-level beautification.

Active ingredients such as peptides, retinoids, antioxidants, botanical extracts, hyaluronic acid, and ceramides are increasingly being incorporated into formulations to address concerns related to aging, pigmentation, acne, dehydration, and environmental damage. Nanocarriers and controlled-release systems have further enhanced the penetration and bioavailability of these actives, ensuring sustained efficacy with improved safety profiles. Moreover, the global shift toward personalized beauty has led to the rise of AI-driven skin analysis, customized regimens, and data-backed product recommendations, enabling consumer-specific solutions.

Simultaneously, the demand for clean, sustainable, and ethically sourced ingredients reflects growing consumer expectations for transparency and environmental consciousness. Aesthetic products also contribute significantly to psychological well-being by enhancing self-confidence, self-perception, and social interaction.

Despite these advances, challenges persist regarding regulatory oversight, standardization of claims, and long-term clinical validation of cosmeceutical efficacy. Nonetheless, aesthetic products continue to redefine contemporary beauty standards by merging scientific rigor with consumer-centric innovation. Their evolving role highlights a future where beauty, health, and technology converge to support holistic dermatological care and enhanced quality of life.

Keywords: Cosmetic, Biotechnology, Dermatological, Aesthetic, Nanotechnology

PIET-APSECON-113

Global Harmonization In Advanced Therapeutics: Balancing Innovation, Safety, And Access

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ABSTRACT

Introduction: Advanced Therapy Medicinal Products (ATMPs),which include gene therapies, somatic cell therapies, and tissue-engineered products, area new paradigm for treating previously intractable 10 diseases. Their regenerative and personalized approach makes them ,unlike conventional treatments, require changing regulatory systems to adjust to their intricacies.

Areas covered: This review gives a comprehensive critique of international regulatory programs that include the FDA's RMAT designation,EMA'sPRIMEprogram,andJapan'sSakigakeprogramintendedto bring ATMPs to patients faster while ensuring patient safety. It also considers innovation-led strategies like adaptive licensing, rolling reviews, and real-world evidence (RWE) decision-making for pre-market authorization and post-market monitoring. In addition, it discusses problems like regulatory divergence, intricate manufacturing standards, price constraints, and the transformative role of digital technologies such as artificial intelligence and blockchain in traceability and regulatory compliance. Patient-centric models andearlyaccessschemesarealsoextensivelydebatedaspartandparcelofthefutureofregulatoryscience.

Expert opinion/commentary : To achieve the maximum potential of ATMPs across the world, regulatory systems need to be harmonized and responsive, involving real-time data analysis, flexible approval processes, and improved stakeholder cooperation. New technologies, coupled with more patient engagement and global convergence efforts, are crucial for providing equal access to effective and safe advanced therapies.

Keywords: Regenerative medicine; patient; treatment; blockchain; RMAT; drug approval

PIET-APSECON-114

ROLE OF AI, MACHINE LEARNING AND ROBOTICS IN HEALTHCARE

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ABSTRACT

Rapid advancements in artificial intelligence (AI), machine learning (ML), and robotics are reshaping modern healthcare by enhancing the accuracy, efficiency, and personalization of medical services. These technologies enable systems to replicate cognitive functions, support clinical decision-making, and automate complex tasks across diagnostics, treatment, and pharmaceutical operations. AI-driven tools, paired with data-rich platforms such as the Internet of Medical Things (IoMT) and cloud-based analytics, facilitate improved disease detection, precise monitoring, and real-time interpretation of biomedical signals. In pharmaceutical and clinical settings, ML algorithms support dose optimization, error identification, and genetic data interpretation, contributing to reduced mortality and overall improvement in patient outcomes.

Simultaneously, intelligent robotic systems have become essential in minimally invasive surgeries, hospital logistics, and routine clinical functions, demonstrating notable gains in precision, safety, and workflow organization. These innovations align with the evolving paradigm of predictive, preventive, personalized, participatory, and precision-based (P5) medicine. However, despite their transformative potential, challenges remain—particularly relating to cost, workforce skill requirements, ethical considerations, and the difficulty of integrating such technologies into resource-limited settings, including rural healthcare infrastructures.

Overall, the convergence of AI, ML, robotics, and IoMT is paving the way for next-generation healthcare systems capable of advanced diagnostics, personalized therapies, enhanced patient monitoring, and accelerated biomedical research. Continued efforts toward scalability, accessibility, and responsible implementation will be critical to realizing their full impact across global and underserved populations.

Keywords: Artificial Intelligence, Machine Learning, Robotics in Healthcare, Internet of Medical Things (IoMT), Precision Medicine.

PIET-APSECON-115

Ethical, Regulatory and Transparency Challenges in AI-Driven Drug Development

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Abstract

The integration of artificial intelligence (AI) into drug development offers unprecedented opportunities to accelerate discovery, improve predictive accuracy, and optimize clinical and manufacturing processes. However, this rapid advancement is accompanied by significant ethical, regulatory, and transparency challenges that must be addressed to ensure responsible and trustworthy deployment. Ethically, AI systems rely heavily on large, sensitive biomedical datasets, raising concerns about patient privacy, data ownership, and informed consent. Bias in training datasets can result in inequitable outcomes, including misclassification of underrepresented populations and unequal access to emerging therapies. Ensuring fairness, accountability, and protection of patient rights is therefore essential.

Regulatory challenges arise from the complexity and dynamic nature of AI models. Many AI algorithms function as opaque "black boxes," complicating validation, reproducibility, and safety assessment. Current regulatory frameworks—designed for static, interpretable models—struggle to accommodate adaptive, continuously learning systems. Key regulatory concerns include algorithm drift, model update governance, data integrity verification, and establishing standardized evaluation metrics for AI performance. The absence of harmonized international guidelines further complicates approval processes and global implementation.

Transparency remains a critical foundation for regulatory acceptance and public trust. Limited interpretability, inadequate documentation of datasets, insufficient model explainability, and proprietary restrictions hinder clear understanding of how AI-driven decisions are made. Enhancing model transparency through explainable AI techniques, robust reporting standards, and open communication between developers, regulators, and end users is imperative.

Collectively, these ethical, regulatory, and transparency issues underscore the need for comprehensive governance frameworks to ensure safe, equitable, and trustworthy integration of AI into modern drug development.

Keywords: Artificial intelligence; Drug development; Ethical challenges; Regulatory challenges; Transparency; Explainable AI; Data privacy; Bias; Machine learning; Pharmaceutical industry

PIET-APSECON-116

The Role of Pharmacovigilance in Detecting and Managing Adverse Drug Reactions

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Abstract

Pharmacovigilance is essential for maintaining the safety of medications by overseeing, identifying, and addressing adverse drug reactions (ADRs). This poster offers a summary of pharmacovigilance frameworks, innovations in ADR detection techniques, and the advantages of a robust pharmacovigilance strategy. As new drug treatments emerge, the need for thorough ADR monitoring has become increasingly vital, directly affecting patient safety and healthcare results. Recent developments, including real-time signal detection, artificial intelligence, and international pharmacovigilance databases, have greatly enhanced the effectiveness of ADR management. Pharmacovigilance is instrumental in guaranteeing the safety of pharmaceuticals through organized identification, evaluation, comprehension, and prevention of adverse drug reactions (ADRs). This poster highlights contemporary techniques, recent breakthroughs, and the profound influence of pharmacovigilance frameworks on today's healthcare landscape, underlining its significance for patient safety and pharmacology.

Keywords: Adverse Drug Reaction, Pharmacovigilance, Monitoring, Safety Management.

PIET-APSECON-117

AI-Based Drug Loaded Phytosomes

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Abstract

AI has emerged as a viable technique for the development of innovative therapeutics in drug delivery systems. The application of artificial intelligence in novel medication delivery systems has the potential to change the area of medicine. Artificial intelligence (AI) can be used to optimize drug delivery systems in a variety of ways, including anticipating drug behaviour in the body, predicting medication interactions, and selecting effective and efficient finished products. Phytosome is a novel emerging technique applied to phytopharmaceuticals that contain phytoconstituents of herbal extract surrounded and bound by lipids. We used AI for optimization of formulation of drug delivery systems, to enhance drug efficacy and reduce toxicity. It has been used to optimize the formulation of drug-delivery systems. Different computational methods were used to design optimal shapes and sizes for nanoparticle binding and drug release. Selection of the optimal treatment strategies is time-consuming, expensive, unpredictable, and not consistently effective. Using Artificial Intelligence (AI) based algorithms it was possible to manage these crucial issues. Integration of AI approaches can bridge this gap, using pattern analysis and classification algorithms for improved diagnostic and therapeutic accuracy.

Keywords: Drug delivery system, Artificial intelligence (AI), Phytosome, Nanoparticles

PIET-APSECON-118

Formulation, In Vitro And In Vivo Evaluation Of Temperature Sensitive Ophthalmic Gel Of An Anti-Glaucoma Drug

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ABSTRACT

In recent years, in situ gelling systems have gained significant attention as an effective approach for ophthalmic drug delivery. The present study focuses on the formulation and evaluation of an in situ gel for the treatment of glaucoma, aimed at enhancing ocular residence time and improving drug bioavailability. The formulations were developed using temperature-sensitive polymer Pluronic F-127 in combination with viscosity-enhancing agent HPMC K4M at varying concentrations. The prepared gels were assessed for parameters including appearance, pH, clarity, gelation capacity, gelation temperature, rheological behavior, drug content, and in vitro drug release. Additionally, ex vivo permeation, microbial testing, in vivo ocular irritancy, and stability studies were conducted on the optimized formulation. Among the tested formulations, BT-4 showed the most favorable characteristics, exhibiting rapid sol-to-gel transition near body temperature, optimal viscosity, and sustained drug release. The optimized gel was found to be non-irritating, clear, and stable over a three-month period. The study concludes that Bimatoprost-loaded in situ gel demonstrates strong potential as a novel ophthalmic drug delivery system for managing glaucoma by effectively controlling intraocular pressure and improving bioavailability.

Keywords: In situ gel, Bimatoprost, Glaucoma, Pluronic F-127, HPMC K4M, Ocular drug delivery

PIET-APSECON-119

Artificial Intelligence In Biomedical Engineering And Its Influence On Healthcare Structure: Current And Future Prospects

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Abstract

Artificial intelligence (AI) is an advancing field within computer science that integrates data science and computational technologies to create intelligent systems capable of analyzing large and complex datasets with remarkable speed and accuracy. Its rapid growth and adaptability have made it indispensable in various sectors, particularly in healthcare. This review provides an overview of AI, its operational principles, and its transformative impact on biomedical engineering. By leveraging machine learning, computer vision, and neural networks, AI systems are revolutionizing medical research, diagnostics, and patient care. In biomedical engineering, AI-driven innovations such as biosensors and smart diagnostic tools enable continuous health monitoring, early detection of physiological abnormalities, and personalized treatment planning. These technologies are reshaping modern medicine by allowing non-invasive, real-time assessment of patient health parameters. Moreover, AI applications in medical imaging, predictive modeling, and biomarker analysis are contributing to more accurate and efficient clinical decision-making. Despite ongoing challenges, including ethical considerations and data privacy concerns, the integration of AI into healthcare continues to accelerate. The increasing use of AI-powered systems promises a future where diagnostics are more precise, medical devices more intelligent, and healthcare delivery more efficient and accessible.

Keywords: Artificial intelligence, biomedical engineering, diagnostics, biosensors, machine learning, medical imaging, biomarker analysis, healthcare innovation.

PIET-APSECON-120

3d Printed Bioengineered Scaffold Containing Chitosan, Alginate, And Barijeh-Loaded Niosomes Enabled Efficient Antibiofilm Activity And Wound Healing

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Abstract

In this work, we introduced a new biocompatible wound-healing scaffold by encapsulating Barijeh (Bar), a plant-derived antibacterial agent, inside niosomes (Nio). The Nio-Bar system was blended into a chitosan (CS) and alginate (AL) hydrogel and then fabricated into a three-dimensional structure using 3D printing, resulting in the **Nio-Bar@CS-AL** scaffold. The scaffold demonstrated controlled degradation, reaching approximately 68% (w/w) over a 14-day period.

Nio-Bar@CS-AL exhibited strong antibacterial performance, achieving more than a 5-log reduction of *Pseudomonas aeruginosa* and *Staphylococcus aureus*, significantly outperforming the CS-AL scaffold alone. It also reduced biofilm formation by 74%–80% for both pathogens. Importantly, it showed no cytotoxic effects on human fibroblast (HFF) cells, confirming its suitability for wound applications.

In an in vivo murine wound model, the scaffold promoted over 90% wound closure within 10 days. Enhanced tissue repair was further supported by a twofold increase in TGF-β expression and a near-normal reduction in IL-6 levels, indicating lowered inflammation. Histopathological evaluation revealed substantially greater collagen deposition in treated wounds compared to the control group, highlighting improved tissue regeneration.

Overall, these findings demonstrate that the **Nio-Bar@CS-AL scaffold** offers a promising and multifaceted approach for managing wound infections and promoting effective healing.

Keywords : Wound dressing3D printing Antibacterial and antibiofilmIn vitro study

PIET-APSECON-121

AI-BASED ECG INTERPRETATION FOR ARRHYTHMIA DETECTION

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Abstract

Electrocardiography (ECG), improved by artificial intelligence (AI), has become a potential technique for the precise diagnosis and treatment of cardiovascular disorders. The conventional ECG is a frequently used, inexpensive, and easily accessible test that offers important information about the physiological and anatomical state of the heart. However, the ECG can be interpreted differently by humans depending on the interpreter's level of training and experience, which could make diagnosis more difficult. Using AI, especially deep learning convolutional neural networks (CNNs), to look at single, continuous, and intermittent ECG leads that has led to fully automated AI models that can interpret the ECG like a human, possibly more accurately and consistently. The use of AI in ECG analysis has several benefits, including the quick and precise detection of problems like arrhythmias, silent cardiac illnesses, and left ventricular failure. It has the potential to help doctors with interpretation, diagnosis, risk assessment, and illness management. Aside from that, AI-enhanced ECGs have been demonstrated to boost the identification of heart failure and other cardiovascular disorders, particularly in emergency department settings, allowing for quicker and more precise treatment options. The use of AI in cardiology, however, has several limitations and obstacles, despite its potential. The lack of robustness in models when applied to disparate populations frequently hinders their practical applicability. In summary, AI-enhanced electrocardiography has enormous potential to improve the management of cardiovascular illness by delivering precise and timely diagnostic insights, aiding clinicians, and enhancing patient outcomes. Further study and development are required to fully realize AI's promise for improving cardiology practices and patient care as technology continues to advance.

Keywords: Artificial intelligence Electrocardiography, Diagnosis Cardiovascular disease

PIET-APSECON-122

Chemometric-Driven Standardization: A Modern Approach to Ensure Quality of Herbal Formulations

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Abstract

Ensuring the quality, safety, and efficacy of herbal formulations remains a major challenge due to their complex phytochemical composition and natural variability. Traditional standardization techniques often rely on limited marker compounds and may fail to capture the full chemical diversity of herbal matrices. Chemometrics—an advanced analytical approach combining mathematics, statistics, and computational tools—has emerged as a modern and powerful strategy for holistic standardization of herbal formulations. By enabling multivariate data analysis, chemometric techniques provide deeper insights into chemical fingerprints, batch-to-batch consistency, and correlations between phytochemical patterns and therapeutic activity.

This poster highlights the application of chemometric-driven methods such as Principal Component Analysis (PCA), Partial Least Squares (PLS), Hierarchical Cluster Analysis (HCA), and multivariate regression models in the standardization of herbal products. Chromatographic and spectroscopic data obtained from HPLC, GC-MS, FTIR, and UV–Vis were processed using chemometric algorithms to generate comprehensive chemical profiles. Key parameters such as component variability, outlier detection, quality classification, and predictive modeling were systematically evaluated.

Results demonstrate that chemometric analysis enhances discrimination between authentic and adulterated samples, improves quantification accuracy, and supports robust quality control strategies. The integration of chemometrics with modern analytical platforms enables rapid, reliable, and reproducible standardization, ultimately ensuring product consistency and consumer safety.

Overall, chemometric-driven standardization represents a transformative approach in modern herbal drug research. It offers a scientific, data-driven framework to overcome the limitations of traditional methods and paves the way for globally acceptable quality assurance in herbal formulations.

Keywords: Chemometrics, Herbal Standardization, Multivariate Analysis, PCA, PLS, Quality Control, Chemical Fingerprinting, Herbal Formulations.

PIET-APSECON-123

Interferon-Driven CXCL9–CXCR3 Pathway as a Biomarker and Therapeutic Target in Breast Cancer

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Abstract

Breast cancer remains one of the most prevalent and life-threatening malignancies among women worldwide, characterized by marked molecular heterogeneity and variable clinical outcomes. Despite major progress in targeted therapies and immunomodulatory approaches, many patients particularly those with aggressive subtypes such as triple-negative breast cancer (TNBC) continue to face limited treatment options and poor prognosis. This has intensified efforts to understand the molecular pathways that govern tumor progression, immune interactions, and therapeutic responsiveness.

Among these pathways, the CXCL9–CXCR3 chemokine axis has emerged as a critical regulator of breast cancer biology. CXCL9, an interferon-γ–induced chemokine, mediates the recruitment of CXCR3-expressing immune effector cells, especially $CD8^+$ cytotoxic T lymphocytes and Th1-polarized $CD4^+$ cells, thereby fostering an immune-inflamed tumor microenvironment. Such immunogenic tumors often demonstrate enhanced antitumor immunity, reduced tumor burden, and improved clinical outcomes. Notably, elevated CXCL9 expression correlates with increased tumor-infiltrating lymphocytes and heightened sensitivity to immune checkpoint inhibitors, positioning this axis as a promising predictive biomarker for immunotherapy, particularly in TNBC.

Paradoxically, CXCR3 is also expressed on breast cancer cells, where its activation by CXCL9 can promote migration, invasion, epithelial–mesenchymal transition, and metastatic dissemination. This dual, context-dependent behavior highlights the complex biology of the CXCL9–CXCR3 axis and underscores the importance of cell-type specificity in therapeutic targeting. Emerging strategies aim to enhance CXCL9-mediated immune activation while selectively inhibiting CXCR3 signaling on tumor cells.

Overall, the CXCL9–CXCR3 axis represents a pivotal pathway at the intersection of tumor immunity and cancer cell behavior, offering significant diagnostic, prognostic, and therapeutic potential in advancing precision-guided breast cancer treatment.

Keywords: Breast Cancer, CXCL9–CXCR3 axis, TNBC, Immunity.

PIET-APSECON-124

Drug Discovery And Development

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Abstract:

Developing a new medicine is a long, complicated, and costly journey. On average, it can take 10–15 years and over two billion dollars before a drug finally reaches patients. The process begins with drug discovery, where scientists identify and study disease targets, search for promising chemical "hits," and refine them into potential lead compounds. Once a strong candidate is found, the drug development phase begins. This includes improving its chemical properties, testing its safety in animals, conducting clinical trials in humans, and navigating strict regulatory approvals. Today, the pharmaceutical industry faces major challenges—high research costs, patent expirations, environmental concerns, and increasingly demanding regulations. These pressures have slowed productivity, creating an urgent need for smarter, faster, and more affordable ways to find new treatments. Modern tools like ultra-high-throughput screening and artificial intelligence are helping, but they have not completely transformed the process. As a result, scientists are exploring alternative strategies such as drug repurposing, which may offer cheaper and quicker paths to new therapies. This review highlights the key steps in early drug discovery and development, discusses the difficulties faced by the industry, and emphasizes the importance of innovation and collaboration among academia, industry, and government. By better understanding these challenges, researchers can design studies that more effectively support the translation of laboratory findings into real medicines that benefit patients.

Keywords: Drug Discovery, Patent, Development, Medicine.

PIET-APSECON-125

Importance of Pharmacovigilance In Pharmaceutical Industry

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Abstract

Pharmacovigilance (PV) is the science and set of activities dedicated to the detection, assessment, understanding, and prevention of adverse drug reactions (ADRs) and other drug-related problems. As the global use of medicines continues to rise, ensuring their safety has become a critical component of public health systems. PV plays a key role in monitoring the risk–benefit profile of pharmaceutical products throughout their lifecycle, from clinical trials to post-marketing surveillance. Despite its progress, pharmacovigilance faces challenges such as underreporting, variable data quality, and limited awareness among healthcare providers and patients. Strengthening reporting culture, integrating digital technologies, and enhancing global collaboration are essential to improving drug safety systems.In conclusion, pharmacovigilance is vital for safeguarding public health by continuously evaluating medication safety and minimizing risks associated with drug therapy. A robust pharmacovigilance framework not only protects patients but also supports evidence-based decision-making, leading to safer therapeutic outcomes worldwide.

Keyword: Pharmacovigilance (PV), Public health systems, Post-marketing surveillance, Digital technology integration, Safer therapeutic outcomes

PIET-APSECON-126

Drug Discovery And Development

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Abstract

Drug discovery and development is a long, meticulous journey that transforms scientific ideas into real medicines that can improve or even save lives. The process begins with understanding a disease at its core—researchers study what causes it, which molecules are involved, and where a new medicine might make a difference. Once a target is identified, thousands of potential compounds are explored to see which ones show even the slightest promise. Modern tools such as computer-based simulations, AI predictions, and high-throughput screening help scientists quickly filter out weak candidates and focus on the most hopeful ones.When a potential drug looks promising, it moves into the preclinical stage. Here, its safety, behavior inside the body, and potential toxicity are carefully studied using laboratory models. Only a handful of compounds make it past this stage and enter clinical trials, where the real test begins. Clinical development happens in phases: the first phase checks if the drug is safe for humans, the second tests whether it actually works for the intended disease, and the third gathers more large-scale evidence to confirm benefits and uncover any side effects. If a drug successfully passes all these hurdles—which many do not—it is submitted for regulatory approval. Experts then review all data to ensure the drug is both effective and safe for public use.Even after approval, the journey continues. Post-marketing studies monitor how the drug performs in everyday settings and track rare or long-term effects. Although the entire process can take years and requires immense resources, continuous advancements in technology, genomics, and personalized medicine are helping make drug development faster, more precise, and more hopeful for patients worldwide.

Keywords: Post-marketing, Drug Discovery, drug development, Research

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Neuroprotective methodologies in treatment of Multiple Sclerosis: Current status of Clinical and Pre-clinical findings

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Abstract

MS idiopathic and autoimmune associated motor neuron disorder that attacks myelinated neurons in specific brain regions of young people (20-40 years), especially females; characterized by oligodendrocytes destruction causes demyelination, neuroinflammation, mitochondrial abnormalities, oxidative stress and neurotransmitter deficits associated with motor and cognitive dysfunctions, vertigo and muscle weakness. Limited intervention of pharmacologically active compounds like interferon-β, mitoxantrone, fingolimod and monoclonal antibodies used clinically are majorly associated with adverse drug reactions. Pre-clinically, gliotoxin ethidium bromide stereotaxically mimics the behavioral and biochemical alterations present in MS rats associated with downregulation of adenyl cyclase/cAMP/CREB activation further responsible for varieties of neuropathogenic factors. In spite of considerable investigate into neuroprotection, treatment choices are still constrained to strong care and organization of complications. As of now accessible drugs give symptomatic alleviation but don't end development of illness. In this way, the advancement of unused helpful techniques remains neglected restorative requires. Disappointment of current steady treatment may be due to their activity at as it were one of numerous neurotransmitters included or their failure to up direct signaling flag bearers detailed to have vital part in neuronal sensitivity, neurotransmitter biosynthesis and discharge, neuronal development and separation, synaptic versatility and cognitive working. Therefore, current review strictly focused on exploration of various clinical and pre-clinical features available for MS to understand the pathogenic mechanisms as well as introduce various pharmacological interventions associated with upregulation of intracellular adenyl cyclase/cAMP/CREB activation.

Keywords: MS, oligodendrocytes, demyelination, mitochondrial dysfunctioning, gliotoxin, adenyl cyclase, CREB activation