Souvenir Cum Scientific Abstract

International Conference on Health Science and Technology

IM-HST Summit 2025

INDO-MALAYSIAN - HEALTH SCIENCE & TECHNOLOGY SUMMIT 2025

Organized by
P.R.S Educational Trust
in collaboration with
School of Pharmaceutical Education and Research, Jamia Hamdard
and
Sir Jeffrey Cheah Sunway Medical School, Faculty of Medical and Life Sciences, Sunway University, Malaysia
Venue:
Constitution Club of India, New Delhi

ISBN: 978-3-96492-589-3

Weser Books

R.V. NORTHLAND INSTITUTE
PHARMACY

(ISO 9001:2015 certified)
Approved and affiliated by Pharmacy Council of India,
AICTE New Delhi, Dr. APJ AKTU and BTE Lucknow.

"Igniting young minds through holistic approach and outcome based education"

COURSES OFFERED

- D. PHARM. (Diploma in Pharmacy) 2 Years
- B. PHARM. (Bachelor in Pharmacy) 4 Years
- M.PHARM. (Pharmaceutics) 2 Years
- M.PHARM. (Pharmacology) 2 Years

R.V. Northland Institute, Dadri (G.B. Nagar) U.P.
Mob.: 9311511093, 9311204570, 9810981348
Web: www.rvnorthlandinstitute.com
E-mail: infodrvnorthlandinstitute.com,
rvnorthlandinstitute204@gmail.com

BIOTENIC PHARMA

Delivering Solutions to Accelerate Research

Biotenic Pharma Private Limited is a dynamic and fully integrated Contract Research Organization (CRO) committed to providing comprehensive research and development (R&D) solutions to scientific and research organizations worldwide.

- **ISO 9001-2015 Accreditation from International Standard Organization for Biological and Chemical Testing**
- **IBSC Registered - Institutional Biosafety Committee (IBSC), a regulatory body under the Department of Biotechnology in India, which oversees research involving genetically engineered organisms (GMOs) and ensures compliance with biosafety guidelines**

RCGM Secretariat
Department of Biotechnology
Ministry of Science and Technology

BTP Preclinical Research Laboratory Verticals:

In-vitro & In-vivo Research Capabilities

Pharmacology Department - Mechanistic studies, efficacy screening
Pharmacokinetics - ADME profiling, drug metabolism studies
Genetic Toxicology - Mutagenicity, chromosomal aberration tests
Microbiology - Antimicrobial testing, biofilm studies
Pharmacokinetics - In vivo ADME, bioavailability, tissue distribution
Safety & Toxicology Department - Cytotoxicity, genotoxicity, organ-specific toxicity, Acute, sub-chronic, chronic toxicity studies

Email: pmc@biotenicpharma.in |bd@biotenicpharma.in
Contact: +91 9205248686, 9220748686, 9675216639

Prof. (Dr.) Mohammad Afshar Alam
Vice Chancellor, Jamia Hamdard, New Delhi

MESSAGE

It gives me immense pleasure to extend my warm greetings to all participants, delegates, speakers, and organizers of the International Conference on *"Health Science and Technology"*. This prestigious event brings together leading academicians, researchers, industry experts and students from across the globe to exchange knowledge, showcase innovations and deliberate on advancements that are shaping the future of healthcare and technology.

Health science and technology today stand at the forefront of transformative change. The convergence of medical research, digital technologies, and innovative practices holds the potential to address some of the most pressing global health challenges. I am delighted to see this platform fostering interdisciplinary dialogue, promoting collaboration, and encouraging the dissemination of groundbreaking ideas that will contribute significantly to society.

The publication of this abstract book reflects the collective intellect and dedication of all contributors. It is not only a compilation of scientific ideas but also a testament to the spirit of innovation and inquiry that drives progress in healthcare and technology.

I extend my heartfelt appreciation to the organizing committee for their relentless efforts in making this conference a grand success. I also congratulate all contributors whose valuable research finds place in this volume. I am confident that the deliberations and outcomes of this conference will inspire further research, collaborations, and innovations for a healthier future.

With warm regards,

Prof. (Dr.) Mohammad Afshar Alam
Vice Chancellor, Jamia Hamdard
Chief Patron

Prof. (Dr.) Uma Bhandari
Dean, SPER, Jamia Hamdard, New Delhi

MESSAGE

It is indeed a distinct honor and privilege to convey my warm greetings to all participants, delegates, and distinguished guests attending the International Conference on "*Health Science and Technology"*, scheduled on 4th & 5th, October 2025 at the Constitution Club of India, New Delhi. This prestigious gathering serves as a remarkable platform where academicians, researchers, industry experts, and budding scholars converge to exchange knowledge, present their research findings, and explore emerging trends in the dynamic fields of health sciences and technology.

In today's rapidly evolving landscape, the confluence of cutting-edge medical research with innovative technological solutions is reshaping the way healthcare is delivered across the globe. From improving diagnostic precision and treatment efficacy to enhancing patient care and accessibility, the integration of health science and technology holds immense promise for addressing some of the most pressing healthcare challenges of our time. Such Conferences play a pivotal role in fostering dialogue, encouraging knowledge sharing, and nurturing collaborations that can lead to practical and transformative solutions for society.

Over the course of these two days, I am confident that the diverse sessions, presentations, and discussions will provide an intellectually stimulating environment. The research contributions and deliberations shared here are expected to not only deepen our understanding of contemporary health innovations but also ignite new ideas that may shape the future of healthcare research and practice. Such exchanges of perspectives across multiple disciplines are vital in creating innovative pathways that can significantly impact patient outcomes, healthcare policies, and global health strategies.

I would like to extend my heartfelt appreciation to the organizing committee, supporting institutions, and all individuals whose unwavering dedication and meticulous efforts have made this conference possible. Your commitment to advancing knowledge and facilitating collaboration within the scientific and healthcare communities is truly commendable.

It is my sincere aspiration that this conference will provide all participants with a rewarding and enriching experience that inspire curiosity, strengthen professional networks, and foster meaningful collaborations. May the deliberations over these two days pave the way for innovative research, actionable insights, and impactful solutions that contribute to the advancement of health science and technology, ultimately benefitting society at large.

With warm regards,

Prof. (Dr.) Uma Bhandari
Patron

Prof. (Dr.) M. Shahar Yar
Jamia Hamdard, New Delhi

MESSAGE

I am honored to extend a cordial welcome to all delegates, researchers, academicians and distinguished guests joining us for the Two-Day International Conference on ''*Health Science and Technology*''. This gathering represents a significant opportunity to bring together minds from diverse disciplines to share knowledge, explore innovative ideas, and engage in meaningful discussions in the ever-evolving domain of health sciences and technology.

Conferences like this serve as a vital platform for presenting cutting-edge research, highlighting novel approaches, and fostering interdisciplinary collaborations that have the potential to shape the future of healthcare. The contributions of each participant is a testament to the dedication, creativity, and scientific rigor prevalent in the fields of Pharmaceutical sciences, Medical technology, and healthcare innovation. Your efforts not only showcase the depth and breadth of ongoing research but also inspire dialogue that can lead to transformative solutions for some of today's emerging healthcare challenges.

I would like to express my heartfelt gratitude to all the researchers and contributors for their invaluable participation. Your work reflects the dynamic nature of health science research and emphasizes the importance of collaboration across disciplines to address complex medical and technological issues. The diversity of ideas presented at this conference underscores the richness of scientific inquiry and the potential for meaningful impact on society.

It is my hope that this conference will go beyond being a platform for presentations and serve as a forum for interactive learning, constructive discussions, and professional networking. May it stimulate curiosity, encourage knowledge sharing, and ignite innovative initiatives that contribute to advancements in both science and healthcare delivery. The exchange of ideas and experiences here is expected to foster collaborations that transcend institutional and geographical boundaries, paving the way for future breakthroughs and practical applications.

I extend my best wishes for the success of the conference and hope that every participant finds the sessions both intellectually enriching and inspiring. May this gathering spark new perspectives, nurture professional relationships, and motivate actions that drive progress in health sciences and technology. Your active engagement and enthusiasm are the cornerstone of a truly impactful conference experience, and I am confident that the discussions over these two days will be both productive and enlightening.

Welcome once again, and I look forward to the meaningful interactions, innovative ideas, and collaborative spirit that will define this conference.

Best regards,

Prof. (Dr.) M. Shahar Yar
Chairperson

Prof. (Dr.) Vetriselvan Subramaniyan
Deputy Dean (Internationalisation), Department of Biomedical Sciences, Sir Jeffrey Cheah Sunway Medical School, Faculty of Medical and Life Sciences, Sunway University, Malaysia

MESSAGE

It is with greatest pleasure that I extend a heartfelt welcome to all attendees joining us for the Two-Day International Conference on "*Health Science and Technology*", to be held on 4th & 5th October, 2025 at the Constitution Club of India, New Delhi. This event stands as a remarkable convergence of minds, bringing together scholars, researchers, industry professionals, and innovators who are shaping the future of health science and technological advancement.

The field of health science and technology is evolving at an unprecedented pace, and conferences like this serve as a vital platform for the exchange of ideas, dissemination of knowledge, and exploration of novel solutions to complex healthcare challenges. Over these two days, participants will have the opportunity to engage in thought-provoking discussions, share cutting-edge research, and explore collaborative opportunities that transcend geographical boundaries. The insights and experiences exchanged here will not only enhance scientific understanding but also foster innovation and inspire new directions in research and application.

I take this opportunity to commend the organizing committee for their unwavering commitment and meticulous efforts in curating a program that brings together a diverse spectrum of experts and participants from around the world. Their dedication ensures that the conference will be both intellectually stimulating and practically relevant, providing an environment conducive to learning, networking, and collaboration.

Such gatherings are crucial in bridging the gap between research and real-world application, offering a unique space where ideas can be challenged, refined, and transformed into impactful solutions for contemporary healthcare needs. I am confident that the interactions, presentations, and deliberations over these two days will be enriching, providing both inspiration and actionable insights for all attendees.

As we embark on this exciting journey of exploration and discovery, I encourage each participant to actively engage, share their expertise, and embrace the collaborative spirit that defines this conference. It is my sincere hope that this event will leave you with new knowledge, meaningful connections, and renewed motivation to advance the frontiers of health science and technology.

I extend my best wishes to all participants for a productive, enlightening, and successful conference. May the discussions and interactions over these two days contribute significantly to both personal growth and the collective advancement of healthcare and technological innovation.

Best regards,

Prof. (Dr.) Vetriselvan Subramaniyan
Co-chairperson

Dr. Akhil Sharma
Director, PRS Educational Trust

MESSAGE

I am delighted to warmly welcome all distinguished delegates, researchers, and professionals who are joining us for the International Conference on "*Health Science and Technology* 2025", scheduled to take place on the 4th & 5th October, at the Constitution Club of India, New Delhi. This gathering represents a remarkable convergence of minds and expertise, bringing together pioneers, innovators, and thought leaders from across the spectrum of health sciences and technological advancements.

The conference aims to provide an enriching platform where participants can present their pioneering research, exchange valuable insights, and engage in meaningful dialogue. It serves as a dynamic space for fostering interdisciplinary collaborations, exploring cutting-edge innovations, and envisioning practical solutions to the pressing challenges in healthcare. The collection of abstracts compiled in this book exemplifies the ingenuity, perseverance, and scholarly rigor of our contributors, reflecting the vibrant intellectual energy that defines this event.

We anticipate that the ideas shared, discussions sparked, and connections established during these two days will not only enhance scientific understanding but also pave the way for tangible advancements in healthcare practices, policy, and technology. Conferences of this nature play a critical role in bridging the gap between research and application, enabling knowledge transfer that can ultimately impact patient care, public health strategies, and technological innovation.

I wish to convey my deepest gratitude to the organizing committee, speakers, and all participants whose tireless efforts and unwavering commitment have made this event possible. Your dedication to advancing the frontiers of health science and technology is truly commendable. It is your active engagement, curiosity, and collaboration that will transform this gathering into an inspiring and productive experience for everyone involved.

As we embark on these two days of intellectual exchange, I hope this conference stimulates thought-provoking discussions, nurtures professional relationships, and encourages collaborative initiatives that extend far beyond this event. May it serve as a catalyst for continued innovation, knowledge dissemination, and progress in the ever-evolving field of health science and technology. I extend my best wishes to all attendees for a stimulating and rewarding conference experience.

Best regards,

Dr. Akhil Sharma
Director
PRS Educational Trust

SCIENTIFIC ABSTRACT INDEX

Table of Contents

	AKANKSHA SAYANA, MEGHA GIRI, DR. SWATI	
IM-HST/2025/019	**DEEP EUTECTIC SOLVENT-MEDIATED EXTRACTION OF ELEPHANT FOOT YAM STARCH AND ITS MODIFICATION FOR ENHANCED PROPERTIES** DINESH L. BAWANKAR	19
IM-HST/2025/020	**DEVELOPMENT AND OPTIMIZATION OF NANOENGINEERED BEZAFIBRATE-LOADED CALCIUM NANOPARTICLES** SHIKHA YADAV, NEELAM DATT	20
IM-HST/2025/021	**COMPARATIVE PHYTOCHEMICAL CHARACTERIZATION OF ARGYREIA NERVOSA AND PARTHENIUM HYSTEROPHORUS: ETHNOPHARMACOLOGICAL PROMISE VERSUS ECOLOGICAL RISK** SMITA KHARE, DR SONAKSHI ANTAL, DR. KAPIL KHATRI	21
IM-HST/2025/022	**SYNTHESIS OF FURAN-FUSED IMIDAZOPYRIDINE DERIVATIVES TOWARDS IDENTIFICATION OF POTENTIAL ANTIBACTERIAL AGENTS** SANDESH S. SARJERAO	22
IM-HST/2025/023	**NANOMEDICINES IN METABOLIC DISORDERS: EXPLORING INNOVATIVE NANOTECHNOLOGY-BASED APPROACHES FOR THE DIAGNOSIS AND TREATMENT OF METABOLIC DISEASES** SAUMYA DUBEY, HARENDER GEHLAUT, DR. SHAWETA SHARMA	23
IM-HST/2025/024	**MOLECULAR DOCKING STUDIES OF SOME AURONE DERIVATIVES AS ANTI-MALARIAL AGENTS** PIYUSHI MISHRA	24
IM-HST/2025/025	**IMPORTANCE OF ARTIFICIAL INTELLIGENCE IN THE DRUG DISCOVERY OF NATURAL PRODUCTS** ANKITA PRIYADARSHINI SAHOO, G S CHAKRABORTHY	25
IM-HST/2025/026	**NANOMEDICINE: AN EMERGING TOOL IN HEALING CHRONIC WOUNDS AND ITS OPPORTUNITIES** ARSH CHANANA, DR RAVINDRA PAL SINGH	26
IM-HST/2025/027	**PHYTOCHEMICAL-DRIVEN NANO MEDICINE: A GREEN REVOLUTION IN DIABETES THERAPY** DEEPANSH KUMAR	27

IM-HST/2025/028	**EMERGING ROLE OF FLAVONOIDS IN THE MANAGEMENT OF ULCERATIVE COLITIS** MEGHA GIRI, AKANKSHA SAYANA, DR. SWATI	28
IM-HST/2025/029	**IN-VIVO ACTIVITY OF MANNOSE COATED NITAZOXANIDE NANOSPHERES FOR LIVER FIBROSIS** SHEKHAR SINGH, KM KULSOOM BANO	29
IM-HST/2025/030	**FORMULATION AND EVALUATION OF EXTENDED-RELEASE BILAYER TABLETS CONTAINING EMPAGLIFLOZIN AND METFORMIN HYDROCHLORIDE FOR DIABETES MELLITUS MANAGEMENT** KRISHNA DEORE, MOHAMMAD ISMAIL MOUZAM	30
IM-HST/2025/031	**NOVEL MICRO-EMULSION-BASED SYNTHESIS OF SILVER NANOPARTICLES USING CITRUS BERGAMIA ESSENTIAL OIL FOR BREAST CANCER** POOJA SANTOSH MURKUTE	31
IM-HST/2025/032	**POLYHERBAL FORMULATION FOR ENHANCED WOUND HEALING** PREETI SHARMA, SATISH SARDANA, MONIKA SACHDEVA	32
IM-HST/2025/033	**QUANTITATIVE STRUCTURE-ACTIVITY RELATIONSHIP (QSAR) STUDIES OF SOME THIOSEMICARBAZONE DERIVATIVES AS ANTI-MALARIAL AGENTS** PRIYANKA SINGH	33
IM-HST/2025/034	**STABILITY INDICATING RP-HPLC ASSAY METHOD DEVELOPMENT AND VALIDATION FOR THE SIMULTANEOUS ESTIMATION OF ESOMEPRAZOLE AND METHOTREXATE** RASHMI DORAI, DR. ANURAG MISHRA	34
IM-HST/2025/035	**ETHNOPHARMACOLOGY, PHYTOCHEMISTRY, PHARMACOLOGICAL INSIGHTS OF ANGELICA GLAUCA EDGEW. FROM THE WESTERN HIMALAYA** SOMESH THAPLIYAL	35
IM-HST/2025/036	**EFFECT OF DIFFERENT DRYING APPROACHES ON THE YIELD AND VOLATILE CONSTITUENTS OF EUCALYPTUS CITRIODORA OIL** DEEKSHA TOKAS, DR. PRIYANKA ROHATGI	36

IM-HST/2025/001

Development of an RP-HPLC Method For Simultaneous Estimation of Remogliflozin, Metformin, and Teneligliptin in Tablet Formulation

Shah Dhwani*, Shah Hirak, Vegad Kunjal

Parul College of Pharmacy and Research, Bhopal, Ahmedabad, India

Corresponding Author: Shahdhwani57@gmail.com

Abstract

Introduction: A cost-effective and reliable RP-HPLC method was developed and validated for the simultaneous estimation of Remogliflozin, Metformin and Teneligliptin in Pharmaceutical dosage form.

Method: ECO-C18 5µ column used with a mobile phase consisting of Phosphate Buffer pH 3.5: ACN (Acetonitrile) 40:60 v/v, analysis was conducted at 222 nm with a flow rate of 1.0 mL/min.

Result: The validation method followed ICH guidelines, demonstrating linearity with LOQ values of 4.79 µg/ml for Remogliflozin, 24.85 µg/ml for Metformin and 0.56 µg/ml for Teneligliptin. LOD values were determined as 1.43 µg/mL for Remogliflozin, 7.53 µg/ml for Metformin and 0.17 µg/mL for Teneligliptin, with correlation coefficients of 0.99 for all compounds. %Recovery ranged from 99.73 % to 100.86% for Remogliflozin, 98.59 % to 100.90 % for Metformin and 100.11 to 100.89% for Teneligliptin, while relative standard deviation values for repeatability, interday precision, and intraday precision were all below 2%.

Conclusion: The proposed method exhibited specificity, sensitivity, precision, accuracy, and robustness, making it suitable for routine analysis.

Keywords: Validation, Remogliflozin, Metformin, Teneligliptin.

IM-HST/2025/002

Modulatory effect of Alantolactone on Ischemic preconditioning-mediated cardioprotection in diseased rats

Arun Kumar Tiwari [1]*, Pushpraj S Gupta [1], Mahesh Prasad [2]

[1]Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, 211007, Uttar Pradesh, India

[2]Kamla Nehru Institute of Management and Technology, Sultanpur, 228119, Uttar Pradesh, India

Corresponding Author: aruntiwari.knimt@gmail.com

Abstract

Objective: This study investigate role of alantolactone (AL) in enhancing the cardioprotective effects of ischemic preconditioning (IPC) in hyperlipidaemic (HL) rat hearts by inhibiting the mitochondrial permeability transition pore (MPTP). In HL hearts, IPC's effectiveness was reduced compared to normal rat hearts. AL alone did not reduce infarct size in HL rats subjected to ischemia-reperfusion (IR) injury. However, adding atractyloside (Atr) during reperfusion nullified IPC's reduction of infarct size in AL-treated HL hearts, indicating compromised effectiveness in hyperlipidemia influenced by Atr.

Methods: The study involve 9 groups each consistings of six rats, to investigate mosulatory effect of Alantolactone on Ischemic Preconditioning (IPC) in diseased rats: Myocardial injury biomarkers CK-MB and LDH. Oxidative stress, Mitochondrial function, integrity and other parameters are evaluated for each group.
Result: IPC mitigated decreases in endogenous antioxidants (GSH, SOD, catalase) in normal hearts post-IR injury but not in diseased hearts. AL restored antioxidant levels in HL hearts; however, Atr negated this benefit. Histopathological analysis showed IPC reduced inflammation and myonecrosis in normal hearts, with AL enhancing these benefits in HL hearts. Atr nullified these improvements.AL facilitated IPC-induced attenuation of PI3K expression in HL hearts.

Conclusion: These findings emphasize the importance of understanding the cardioprotective effect of IPC modulated by Alantolactone in diseased rats by inhibiting the Mitochondrial permeability transition pore (MPTP).

Keyword: Alantolactone, Ischemic preconditioning (IPC), Mitochondrial permeability transition pore (MPTP).

IM-HST/2025/003

Nano formulations as emerging Therapeutics for Drug-Resistant Tuberculosis

Avinash Verma, Shaweta Sharma*

School of Medical and Allied Sciences, Galgotias University, Greater Noida, Uttar Pradesh, India

Corresponding Author: shawetasharma@galgotiasuniversity.edu.in

Abstract

The profound burden of drug-resistant tuberculosis (DR-TB), particularly multidrug-resistant (MDR-TB) and extensively drug-resistant (XDR-TB) strains, continues to force investigation of novel therapeutic approaches above and beyond conventional antibiotics. Nano formulations have been identified as a breakthrough in TB management, allowing targeted drug delivery, enhanced bioavailability, and less systemic toxicity. These latest advancements include polymeric nanoparticles, mesoporous silica nanoparticles, and metal-based nanocarriers such as manganese dioxide and silver nanoparticles with amplified intracellular drug release potentiating macrophage targeting. Despite presenting the use of functionalized nanoparticles such as polydopamine-based systems and mannose-decorated carriers, which increased particle uptake by alveolar macrophages, leading to an improved drug concentration at the infected site with Mycobacterium tuberculosis. Co-delivery of multiple drugs within a single nano-platform (e.g., D-cycloserine with levofloxacin or moxifloxacin) mitigates the problem related to non-compliance and provides synergistic activity against resistant TB strains. In addition, inhalable nanoformulations provide better patient compliance and improved pulmonary deposition. Several nanoformulations have immunotherapeutic benefits by activating immune signalling pathways like cGAS-STING in addition to their direct antimicrobial action. Scalability, biocompatibility, regulatory barriers, and long-term safety evaluation are some of the difficulties that clinical translation must overcome. However, the increasing amount of in vitro and in vivo data suggests that nanomedicine is a viable approach for the upcoming generation of DR-TB treatments. Recent nano formulations for drug-resistant TB include polymeric nanoparticles, mesoporous silica nanoparticles, metal-based nanocarriers, lipid-based nanocarriers, inhalable nano formulations, and immunomodulatory nano systems. These nanocarriers enhance drug release, target macrophages, and provide dual antimicrobial effects. They also enhance lung bioavailability and host immunity.

Keywords: Drug-resistant tuberculosis, MDR-TB, XDR-TB, nano formulations, polymeric nanoparticles, mesoporous silica, lipid nanocarriers, metal nanoparticles, inhalable nanomedicine, macrophage targeting, immunotherapy, co-delivery systems.

IM-HST/2025/004

Wheatgrass (Triticum Aestivum Linn): A Review of Its Traditional Uses Along with Phytochemistry and Pharmacology in Skin Cancer Prevention

Devendra Singh*

IIMT College of Medical Sciences, IIMT University, Meerut

Corresponding author: 21221580phdscholars@iimtindia.net

Abstract

Common wheat, Triticum aestivum, yields juvenile grass which is a member of the Poaceae (Gramineae) family. Herbal medicines are comprised of and contain a high quantity of minerals, vitamins, and amino acids. Chlorophyll, which is high quantity in wheatgrass, is sometimes known as "Verdant blood" since it shares a structural resemblance to haemoglobin. As a result, it increases the amount of oxygen delivered to the tissues. Wheatgrass is helpful in healing dangerously sick cancer patients and in curing minor ailments. Wheat grass is known to lower blood cholesterol and in this regard is helpful for sick people and for healthy people. It is then recommended for the general population. It is useful as a detoxifier in cancer, thalassaemia, anaemia, metabolic syndrome and other in constricted blood flow diseases as it facilitates the generation of healthy cells. Finally, the primary finding of the research is that the unpleasant smell and aroma of fresh juice made from wheatgrass is overcome if wheatgrass juice is added to other juices which significantly enhances their nutritional value.

Keywords: Wheatgrass (Triticum aestivum), cancer prevention, liquid green meat, chlorophyll, hemoglobin, detoxifier, diabetes.

IM-HST/2025/005

Design, Synthesis and Biological Evaluation of Novel Imidazo[1,2-A] Pyridine Derivatives as Potential Anti-Alzheimer Agents

Shah Hirak*, Patel Ashish, Ishan Panchal

Parul College of Pharmacy and Research, Parul University, Ahmedabad, India

Corresponding Author: hirakshah285@gmail.com

Abstract

Introduction: Alzheimer's disease (AD) is a neurodegenerative disorder characterized by a progressive decline in memory and cognition. The main cause of neurodegeneration is considered to be the accumulation of amyloid-β. BACE1 is rational target in Alzheimer's disease (AD) drug development due to its role in amyloidogenic cleavage of APP in generating Aβ.

Methods: We designed a series of compound containing imidazo[1,2-a]pyridine moiety as inhibition of BACE1. The compound **IMP 1-14** were synthesized by using different amine attached to imidazo[1,2-a]pyridine moiety. Molecular docking exposed with protein (PDB: 4ACU) that the nitrogen atom of imidazo[1,2-a]pyridine was given π-π stacking with Tyr71 and Val69 and amide linker hydrogen was involved in hydrogen bound interactions with Asp228 and Asp32 of BACE1 active site.

Results: Based on the docking results, the retrieved molecules were synthesized for BACE1 inhibitor and characterized by IR, ^{1}H NMR ^{13}C NMR and Mass spectroscopic techniques. Evaluating the BACE1 inhibitory effects of the synthesized compounds revealed that introducing a imidazo[1,2-a]pyridine moiety resulted in a significant improvement in its BACE1 inhibitory potential.

Conclusion: In this study, compound **IMP-7** and **IMP-11** was the most potent against BACE1 with an IC_{50} value of **3.12 (±0.71)** and **4.41 (±0.91)** respectively, which was concomitant with results of *in silico* docking study.

Keywords
Alzheimer's Disease, BACE1, Imidazo[1,2-a]pyridine moiety, Molecular Docking.

AQbD-Guided UHPLC Method for Everolimus Residue Quantification in Cleaning Validation: A Sustainable Approach

Jagdish Gohel*, Rajendra Kotadiya

Department of Pharmaceutical Quality Assurance, Ramanbhai Patel College of Pharmacy, Charotar University of Science and Technology, Changa, Anand, Gujarat, India.

Corresponding Author: 22drfph001@charusat.edu.in

Abstract

This study presents the development and validation of a novel reverse-phase ultra-high-performance liquid chromatography (UHPLC) method for quantifying everolimus residues on manufacturing equipment surfaces as part of cleaning validation. Everolimus is an anti-cancer drug that has received approval in more than 70 countries for a range of uses, including cancer therapy, treatment of kidney cysts, seizure management, and prevention of organ transplant rejection. It acts as an mTOR kinase inhibitor and can be administered either alone or in combination with other treatments. The optimization process utilized a central composite design after conducting a comprehensive risk assessment. The method involved an Acquity UPLC BEH C18 column (50 mm × 2.1 mm; 1.7 µm) and a mobile phase consisting of Acetonitrile and Water in a 65:35% (v/v) ratio. Key performance parameters such as specificity, precision, accuracy, and linearity were evaluated across a concentration range of 0.4 to 3.0 µg/mL, with limits of detection (LOD) and quantification (LOQ) established at 0.100 µg/mL and 0.392 µg/mL, respectively. Findings showed that the optimized UHPLC method successfully assessed the removal of Everolimus residues, achieving a retention time of 1.57 minutes, alongside high specificity and precision (with % RSD values well within acceptable ranges) and accuracy (with % recovery close to 100%). The method also demonstrated excellent linearity across the tested concentration spectrum. In summary, the UHPLC method developed in this study is effective for detecting Everolimus residues on cleaned manufacturing equipment, meeting regulatory standards while being environmentally conscious due to the limited use of toxic solvents in the mobile phase.

Keywords: AQbD, cleaning validation, green score, residue quantification, UHPLC.

Evaluation of Hemisdesmus Indicus on Bone Remodeling

Kunjal L. Vegad*[1], Dhwani A. Shah[1], Niranjan S. Kanaki[2]

Parul College of Pharmacy and Research, Gujarat, India
K. B. Institute of Pharmaceutical Education & Research Centre, Gandhinagar, Gujarat, India

Corresponding author: kunjalvegad11@gmail.com

Abstract

In osteoporosis, bone mineral density is highly compromised, which may lead to fracture with minimal or no trauma to the bone. In *Ayurveda,* many herbs are mentioned for the treatment of bone fractures. *Hemidesmus indicus* (HI), also known as anantmul (*Asclepiadaceae*), is used in *Ayurveda* for bone-related disorders. Several *in vivo* studies have been performed to evaluate the anti-osteoporotic activity of anantmul. However, the exact mechanism of this action has not been elucidated.

The present work aimed to investigate the effect of anantmul root on various aspects of bone remodeling by *in vitro* cell-based assays.

Aqueous and ethanolic extracts of HI were subjected to various cell-based assays to assess their effects on osteoblast proliferation (MTT assay), osteoblast differentiation (ALP assay), anti-osteoclastic activity (TRAP assay) and bone matrix mineralization (Alizarin Red S staining). All assays were performed in triplicate and the mean and standard error of the mean of replicate values were considered.

Data were analyzed by one-way ANOVA using GraphPad Prism software. Aqueous and ethanolic extracts of HI significantly increase osteoblast proliferation and differentiation. Aqueous extracts of HI showed significant anti-osteoclastic activity.

Keywords: Osteoporosis, Hemidesmus indicus, *in-vitro* cell-based assays, osteoblast, osteoclast.

Assessment Of Atorvastatin and Sinapic Acid Pharmacodynamic and Pharmacokinetic Interaction in Rats

Meesa Madhavi[1]* and Yellu Narsimha Reddy[2]

*[1]Vaagdevi College of Pharmacy, Ramnagar, Hanumakonda, Telangana,506001

[2]College of Pharmaceutical Sciences, Kakatiya University, Hanumakonda, Telangana, 506001

Corresponding author: haritha.madhavi@gmail.com

Abstract

Aim: The present study aimed to evaluate the pharmacodynamic and pharmacokinetic interaction between atorvastatin, a widely used lipid-lowering agent, and sinapic acid, a naturally occurring phenolic compound in rats.

Materials and Methods: Male Wistar rats were divided in to different groups (n=6 each) for a Pharmacodynamic and Pharmacokinetic study. Treatment was given for 7 days in both studies. Pharmacodynamic assessment was carried out by measuring serum lipid profile (total cholesterol, triglycerides, LDL, and HDL) and Pharmacokinetic interaction was studied following a single and multiple oral doses of atorvastatin with or without sinapic acid, plasma samples collected at specific intervals up to 24 hours. Drug concentrations were quantified using HPLC, and pharmacokinetic parameters (Cmax, Tmax, AUC, t½, and clearance) were calculated.

Results: Co-administration of sinapic acid with atorvastatin significantly enhanced atorvastatin's lipid-lowering effect, with greater reduction in serum cholesterol and LDL compared to atorvastatin alone. Pharmacokinetic analysis revealed increased Cmax and AUC of atorvastatin with delayed clearance when co-administered with sinapic acid, indicating a potential drug–nutrient interaction.

Keywords: HPLC, Atorvastatin, Sinapic acid, AUC.

IM-HST/2025/009

Amelioration of gastric ulcers using a hydro-alcoholic extract of Triphala in indomethacin-induced Wistar rats

Mohd Vaseem[1], Prof. (Dr.) Manju Sharma[1], Prof. (Dr.) Vidhu Aeri[2]

[1]Department of Pharmacology, School of Pharmaceutical Education and Research, Jamia Hamdard, New Delhi.

[2]Department of Pharmacognosy and Phytochemistry, School of Pharmaceutical Education and Research, Jamia Hamdard, New Delhi.

Corresponding author: msharma@jamiahamdard.ac.in

Abstract

Introduction: Triphala is a widely prescribed herbal drug in the Indian traditional system of medicine. It is rich of antioxidants and possesses diverse beneficial properties. It is used to treat many diseases such as anaemia, jaundice, constipation, asthma, fever, chronic ulcer, and various gastrointestinal disorders. This study aimed to investigate the ulcer ameliorative effect of hydro-alcoholic extract of Triphala in indomethacin-induced gastric ulcer in Wistar rats.

Methods: Gastric ulcer was induced by indomethacin (10 mg/kg b wt, po) in Wistar rats. Triphala extract (1000 mg/kg b wt, po) or vehicle (1 ml/kg/day po of 1% CMC) was given to the rats for 15 days by oral gavage (n=6). The ulcer ameliorative effect of Triphala extract was compared with standard drug ranitidine (50 mg/kg b wt, po for 15 days). The ulcer index was calculated. Gastric histopathology and biochemical parameters like mucus, lipid peroxide, glutathione (GSH), catalase (CAT), and superoxide dismutase (SOD) were determined.

Results: Treatment with Triphala extract significantly decreased the levels of ulcer index and lipid peroxide in the treated rats. The extract also significantly elevated the levels of mucus, GSH, CAT and SOD. These findings were well matched with the results of histopathological studies.

Conclusion: Triphala extract possesses ulcer ameliorative effect in gastric ulcer through strengthening the gastric mucosa, restoring the free radical scavenging enzymes and reducing the lipid peroxide production.

Keywords: Antioxidant enzymes; gastric ulcer; Triphala; ulcer index.

A Review paper on Breast Cancer Risk Factors and Urbanization's impact on rising cases

Prerana Sanjay Nikam

Jigyasa University

Corresponding author: preranasnikam@gmail.com

Abstract

Breast Cancer is the leading cause of cancer related morbidity and mortality among women globally. This review paper showcasing panoramic analysis of the heterogeneous perspective of Breast Cancer, the prevalent risk factors which are contributing to its occurrence & urbanization impact of rising cases in younger women of metropolitan cities. Through immense scrutiny of recent literature, various modifiable & non modifiable risk factors have been identified, including genetic predisposition like BRCA mutation, lifestyles, hormonal therapies, reproductive pattern changes. Age, gender, Hereditary and environmental factors further enrich to the burden of BC etiology. Moreover, this review portrays the impact of urbanization like stressful life, consumption of junk food; disturb sleep, Tobacco & alcohol consumption, disparities in cancer care due to socioeconomically impact and limited physical activities. Regular screening and awareness about the disease is essential to minimize the prevalence of disease. In conclusion, this review accentuated the importance of risk factors in the development of Breast Cancer and emphasizes the crucial role of lifestyles and preventive measures. The cumulative knowledge of this review is aim to contribute to profound spectrum of Breast Cancer and hope towards future researches and preventive arbitrations.

Keywords: BC, Risk factors, metropolitan cities, women health, Cancer, epidemiology.

IM-HST/2025/011

Preclinical Evidences for Potential of Agmatine in Treatment of Polycystic Ovarian Syndrome in Rats

Sakshi S. Nalkande*, Manish M. Aglawe, Brijesh G. Taksande, Milind J. Umekar

Shrimati Kishoritai Bhoyar College of Pharmacy, New Kamptee, Nagpur, Maharashtra, 441 002, India

Corresponding author: sakshinalkande66@gmail.com

Abstract

PCOS is multifactorial disorder marked by reproductive, endocrine, and metabolic abnormalities. The present study investigated the therapeutic efficacy and underlying pharmacological mechanisms of agmatine in PCOS rats. Neonatal female rats were administered monosodium L-glutamate (MSG) subcutaneously at a dose of 4 g/kg from PND 2 to PND 10 to induce PCOS. MSG used as food additive and serves as neurotoxin which shows significant lesions, nearly 90%, in hypothalamic ARC and neighbouring areas result in dysregulated GnRH. Following the establishment of the PCOS phenotype, rats were treated with varying doses (20–80 mg/kg, i.p.) of the agmatine for two weeks. MSG-induced PCOS was characterized by delayed onset of puberty, irregular estrous cyclicity, increased body weight, disrupted serum sex hormone levels that is elevated LH, AMH and testosterone, and histological evidence of cystic ovarian morphology. The treatment with the agmatine significantly ameliorated these pathophysiological alterations. Specifically, it restored estrous cyclicity and normalized hormonal profiles, including reductions in LH, AMH, testosterone, and lipid levels, alongside an increase in FSH and estradiol concentrations. Histopathological analyses revealed substantial restoration of follicular development and reduction in cyst formation within the ovaries. Furthermore, the agmatine effectively improved behavioral abnormalities commonly associated with PCOS. These findings suggest that the agmatine exerts significant therapeutic effects in MSG-induced PCOS by restoring endocrine balance, improving metabolic parameters, and enhancing ovarian morphology and function.

Keywords: polycystic ovarian syndrome, monosodium L-glutamate, agmatine, neurotoxin, follicles.

Formulation Of Vitamin C Phytosomes: A Strategy to Improve Entrapment and Release

Sonali R. Patil[1]* & Santosh S. Chhajed[2]

[1]* Research Scholar, Department of Pharmaceutical Chemistry, MET's Institute of Pharmacy, Bhujbal Knowledge City, Adgaon, Nashik (MH). (Affiliated to SPPU)

[2]Associate Professor, Department of Pharmaceutical Chemistry, MET's Institute of Pharmacy, Bhujbal Knowledge City, Adgaon, Nashik (MH). (Affiliated to SPPU)

Corresponding Author: patilsonalisp21@gmail.com

Abstract

The current study attempted to develop and examine vitamin C-loaded phytosomes. H-SPC was employed to encapsulate hydrophilic agent, vitamin C using thin film hydration method via rotary evaporator to maximize its bioavailability. Five formulations (F1-F5) with distinct stoichiometric ratio were developed and evaluated for parameters such as physical properties, pH compatibility, entrapment effectiveness, drug loading, *in-vitro* drug release, antioxidant free radical scavenging activity, and particle behavior in the phytosomes system. Formulation F2, with drug lipid ratio of 1:1.5, emerged as promising batch by exhibiting favorable physical appearance with compatible pH of 5.0, highest entrapment efficiency (87.2%) and drug loading capacity (91.8%). The *in-vitro* drug diffusion studies demonstrated maximum cumulative drug release (91.5% at 60 minutes), confirming improved penetration through dialysis membrane compared to free vitamin C. F2 also revealed strong radical scavenging potential via DPPH antioxidant activity. Additionally, this formulation batch indicated valuable colloidal properties comprising of favorable particle size of 293.8 nm, with zeta potential of –32.6 mV and PDI of 0.268, confirming formation of a homogenous and stable formulation. Further SEM examination verified spherical particle, while the effective encapsulation and conversion of vitamin C from crystalline to amorphous form was verified by DSC and XRD studies. From overall finding of the study, F2 can be considered as valuable candidate for transdermal and topical applications of vitamin C with improved stability, penetration, and bioavailability.

Keywords: Vitamin C, phytosomes, encapsulation, penetration, antioxidant.

IM-HST/2025/013

Formulation and Evaluation of Herbal-Based Cosmetic Powder for Pre-Hair-Removal Treatment

Suman R. Borsadiya[1]*, Dharmik M. Mehta[2]

[1]School of Pharmacy, RK University-Rajkot-360002, Gujarat, India,

[2]School of Pharmaceutical Sciences, Atmiya University, Rajkot-360005, Gujarat,

Corresponding author: sumanborsadiya0802@gmail.com

Abstract

Introduction: Hair removal procedures are commonly associated with pain, irritation, and risk of infection. While advanced techniques like laser and electrolysis exist, they are costly, time-consuming, and may cause long-term side effects. The present study focused on developing a herbal pre-care dusting powder to reduce discomfort during hair removal.

Methods: The formulation incorporated Arnica montana and menthol as herbal anesthetic agents, kaolin as an adsorbent, and a blend of talc and rice powder as flow enhancers. Preformulation studies, including micromeritic and flow property evaluations, were carried out for individual ingredients. Trial batches were first prepared using different ratios of talc and rice powder to identify suitable glidants. Based on the outcomes, experimental batches were formulated and evaluated for flow behaviour, water absorptivity, and particle size.

Results: Among the experimental batches, the optimized formulation exhibited desirable properties with an angle of repose of 28°, water absorptivity of 75%, and particle size of 42.75 µm, confirming its suitability as a pre-treatment dusting powder.

Conclusion: The developed herbal powder demonstrated excellent pharmaceutical performance and holds promise as a safe, effective, and natural pre-treatment to minimize pain and irritation during hair removal procedures.

Keywords: Pre-hair removal treatment, Herbal formulation, Dusting powder, Analgesic activity, Arnica montana.

IM-HST/2025/014

IoT-Based Pill Organizer: A Technological Intervention Approach

Anjali J. Patadiya[1*], Dharmik M. Mehta[2]

[1]School of Pharmacy, RK University-Rajkot-360002, Gujarat, India

[2]School of Pharmaceutical Sciences, Atmiya University, Rajkot-360005, Gujarat, India,

Corresponding author: sonianjali0211@gmail.com

Abstract

Background: Medication adherence is a critical challenge in healthcare, particularly among the elderly who face memory-related issues and difficulty in following medication schedules. Missed or delayed doses can compromise patient outcomes and increase healthcare costs. Traditional pill organisers, whether manual or digital, are often limited by user errors, restricted functionality, and poor integration with healthcare systems.

Objectives: This study aimed to design and validate an IoT-based digital pill organiser to enhance medication adherence through automated dispensing, real-time monitoring, and personalised reminders.

Methods: The system incorporated a motor-driven dispensing unit, LED indicators, auditory reminders, and sensors to detect medicine retrieval. A user-friendly software interface enabled patients to set customised dosage schedules and receive timely alerts. Validation was carried out using once-daily, twice-daily, and thrice-daily regimens. Each medication event (e.g., Monday 8 AM dose) was executed and monitored for accuracy according to the prescribed time schedule.

Results: The IoT-based organiser successfully executed all scheduled medication events with 100% accuracy. Hardware and software integration functioned seamlessly, ensuring precise dispensing, reliable dose detection, and effective notification delivery.

Conclusion: The designed IoT-enabled pill organiser was validated as an accurate and efficient tool for medication management. It provides a practical and user-friendly solution that supports timely adherence, enhances patient safety, and contributes to improved healthcare outcomes**.**

Keywords: Medicine regimen, IoT, pill reminder, dispenser, medication adherence.

IM-HST/2025/015

A Study on Knowledge About Medical Device Adverse Events Among Medical Practitioners and Community Pharmacists

Divya Raj*

JJT University, Rajasthan

Corresponding author: divyadominicpaul@gmail.com

Abstract

Medical devices encompass instruments, apparatus, implants, machines, or related articles used for diagnosis, treatment, or disease prevention. However, their use can sometimes result in unintended or harmful effects, known as Medical Device Adverse Events (MDAEs). To enhance patient safety and device quality, global initiatives have been introduced. In India, the Materiovigilance Program of India (MvPI) was launched in 2015 by the Drug Controller General of India at the Indian Pharmacopoeia Commission (IPC), Ghaziabad. MvPI serves as a structured system for identifying, collecting, reporting, and analysing adverse events related to medical devices. This study aimed to assess the awareness and knowledge of materiovigilance among healthcare stakeholders, specifically doctors and pharmacists in Ernakulam city. A validated questionnaire-based survey was conducted among 150 randomly selected participants, with 100 fully completed responses analysed (50 doctors and 50 pharmacists). Results indicated that only 34% of doctors and 38% of pharmacists were aware of the MvPI. The primary reason for underreporting of MDAEs was a lack of knowledge and awareness about the program. To address this gap, it is recommended that IPC conduct regular workshops and seminars to educate healthcare professionals on the importance of materiovigilance and encourage proactive reporting of device-related adverse events to ensure patient safety.

Keywords: Medical Device Adverse Events (MDAEs), Materiovigilance, healthcare professionals.

IM-HST/2025/016

Bridging Tradition, Quality, and In Silico Approaches in Exploring the Wound Healing Potential of Indian Medicinal Plants

Aakash Kumar Jaiswal*, Dr. Varsha Raj

Kharvel Subharti College of Pharmacy, Swami Vivekanand Subharti University, Meerut.

Corresponding author: akj03241994@gmail.com

Abstract

The wound healing potential of Indian medicinal plants reflects a remarkable convergence of traditional wisdom, quality assurance, and modern pharmacological validation. Plants such as Curcuma longa (curcumin), Aloe vera (acemannan, glucomannan), Centella asiatica (asiaticoside, madecassoside), Azadirachta indica (nimbidin, azadirachtin), Ocimum sanctum (eugenol, ursolic acid), Momordica charantia (charantin, polypeptide-p), Nyctanthes arbor-tristis (nyctanthin, flavonoids), Lawsonia inermis (lawsone), Calendula officinalis (triterpenoids, flavonoids), Ficus benghalensis (tannins, flavonoids), and Tridax procumbens (alkaloids, flavonoids) have been widely documented for wound management. Their bioactive constituents exert diverse pharmacological actions, including antioxidant, antimicrobial, anti-inflammatory, collagen-promoting, angiogenic, and epithelialization-enhancing effects, which have been confirmed in in vitro scratch assays and in vivo excision/incision wound models. The quality aspects of these plants—encompassing botanical authentication, phytochemical standardization, and chromatographic fingerprinting—are critical for ensuring safety, consistency, and therapeutic reproducibility of herbal formulations. Beyond conventional methods, in silico approaches such as molecular docking, virtual screening, and ADMET predictions now provide advanced insights into phytoconstituent interactions with wound healing targets like growth factors, cytokines, and collagen-modulating enzymes, thereby accelerating the identification of novel drug leads and reducing experimental costs. Bridging ethnopharmacological knowledge with modern quality control, pharmacological validation, and computational studies highlights the immense potential of Indian medicinal plants to yield affordable, effective, and sustainable wound healing agents for global healthcare.

Keywords: Indian medicinal plants, wound healing, bioactive compounds, quality aspects, in silico studies, therapeutic potential.

IM-HST/2025/017

Integrative Pharmacognostic and Phytochemical Profiling of *Grewia Flavescens Juss*

G.N. Pramodini

Professor & HOD, Department of Pharmacognosy, Nehru College of Pharmacy, Pampady, Kerala

Corresponding author: pramodini0606@gmail.com

Abstract

This study focuses on the pharmacognostic evaluation of *Grewia flavescens Juss,* which is known as donkey's berry, a traditionally valued medicinal plant known for its diverse therapeutic properties. Traditionally, it is used for its antioxidant, anti-inflammatory, and antimicrobial properties. The study enables comprehensive pharmacognostic analysis, including macroscopic and microscopic examinations, and physicochemical parameters were carried out on various parts of the plant, particularly the leaves, and physicochemical constants such as ash values, moisture content, and extractive values were determined to establish quality control parameters. The findings provide essential pharmacognostic standards for *Grewia flavescens Juss*.

Keywords: Pharmacognostic, Physicochemical, *Grewia flavescens Juss.*

IM-HST/2025/018

Essential Oil-Based Nano Formulations: A Novel Frostbite Therapy

Akanksha Sayana*, Megha Giri, Dr. Swati

School of Pharmaceutical Science and Technology, Sardar Bhagwan Singh University, Balawala, Dehradun, Uttarakhand 248001

Corresponding author: akritisayana8493@gmail.com

Abstract

Frostbite is a severe cold-induced injury which is serious medical concern in high altitudes and battlefield regions. This occurs when our body is exposed to cold, causing constriction of blood vessels reducing blood flow to the body. Current treatments are largely symptomatic and are insufficient in preventing long-term complications such as necrosis, tissue loss, and disability. This highlights the urgent need for novel therapeutic strategies that target both the pathophysiology and progression of frostbite injury. Essential oils having anti-inflammatory, antioxidant, antimicrobial, and vasodilatory activity have potential to be used in frostbite management. Essential oil-based nano formulations including liposomes, polymeric nanoparticles, nanocarriers can be the solution to the problems including stability, volatility, bioavailability and also enhance penetration. A formulation comprising different combination of essential oils including rosemary, curcumin etc was also developed and its activity was assessed and found effective in the treatment of frostbite wound These essential oil-based formulations can provide targeted delivery and adapt to the frostbite microenvironment. By integrating the mechanistic potential of essential oils with the precision of nanotechnology, these novel formulations may not only accelerate healing process but also reduce oxidative stress, restore microcirculation, and prevent secondary infections.

Keywords: Frostbite, nano formulations, essential oils, antioxidants.

IM-HST/2025/019

Deep Eutectic Solvent-Mediated Extraction of Elephant Foot Yam Starch and Its Modification for Enhanced Properties

Dinesh L. Bawankar

Datta Meghe Institute of Higher Education and Research DMIHER (DU) Sawangi Meghe Wardha - 442001

Corresponding author: dinesh.bawankar@gmail.com

Abstract

Elephant foot yam (Amorphophallus paeoniifolius) is a rich but underutilized source of starch with potential applications in food, pharmaceutical, and industrial sectors. In the present study, starch was isolated from elephant foot yam corms using an environmentally friendly deep eutectic solvent (DES) system, offering a green alternative to conventional chemical extraction methods. The extracted starch was subjected to detailed identification and characterization to evaluate its physicochemical, structural, and functional properties.

To enhance its functional versatility, the native starch was chemically modified through carboxymethylation, aiming to improve solubility, swelling power, and potential application in controlled release formulations. Comparative analysis between native and carboxymethylated starch highlighted significant improvements in water-binding capacity, paste clarity, and stability, suggesting its suitability for diverse industrial applications.

The study emphasizes the potential of elephant foot yam starch as a sustainable raw material. The combination of green extraction using DES and functional modification by carboxymethylation not only improves the value of this underutilized starch but also contributes to eco-friendly processing approaches indicate that elephant foot yam starch, in its modified form, could serve as an important biopolymer for food, pharmaceutical, and biodegradable material applications.

Keywords: Elephant foot yam starch, Deep eutectic solvent, Carboxymethylation, starch modification, Functional properties.

IM-HST/2025/020

Development and Optimization of Nanoengineered Bezafibrate-Loaded Calcium Nanoparticles

Shikha Yadav, Neelam Datt*

Babu Banarasi Das Northern India Institute of Technology, Sector-II, Dr. Akhilesh Das Nagar, Ayodhya Road, Lucknow, Uttar Pradesh 226028, India.

Corresponding author: neelamdatt@bbdniit.ac.in

Abstract

Introduction

Bezafibrate is a fibrate or fibric acid derivative, classified as BCS class II, with poor water solubility and high permeability. It is used to decrease cholesterol and lipid levels in the blood. Bezafibrate increases high-density lipoproteins (HDL), which help lower the risk of heart attacks, atherosclerosis, and angina. Although it is available in solid dose form for cardiovascular conditions, its effectiveness is limited.

Material and Methods

This study aimed to develop and evaluate a novel bezafibrate-loaded calcium nanoparticle (BZ-CNP) system to improve its therapeutic efficacy. Bezafibrate-loaded calcium nanoparticles (BZ-CNPs) were synthesized using a chemical precipitation method, utilizing sodium hydroxide as a precursor, calcium nitrite, and sodium laurel sulphate as key components. The optimization process was carried out using Box-Behnken Design (BBD) with the help of the Design Expert 12 software. A total of fifteen experimental batches, including three center points, were prepared to examine the effects of these variables on the nanoparticle characteristics. The optimized batches were characterized for particle size, zeta potential, entrapment efficiency, SEM, FTIR, DSC, and drug release.

Results

The optimized BZ-CNPs displayed a particle size of 242.1 nm, a polydispersity index (PDI) of 0.302, and a zeta potential of −32.7 mV, indicating a stable nanoscale dispersion. The entrapment efficiency was 87.2%, demonstrating effective drug loading. SEM images showed the spherical shape and particle size of the calcium nanoparticles, while DSC images demonstrated the stability of the drug and nanoparticles.

Conclusion

The developed bezafibrate-loaded calcium nanoparticles could be an effective nanocarrier system for targeted delivery.

Keywords: Nanoengineered, Bezafibrate-Loaded Calcium Nanoparticles**,** high-density.

Comparative Phytochemical Characterization of *Argyreia nervosa* and *Parthenium hysterophorus*: Ethnopharmacological Promise versus Ecological Risk

Smita Khare[*1], Dr Sonakshi Antal[1], Dr. Kapil Khatri[2]

[*1]SRM Modinagar College of Pharmacy, Faculty of Medicine & Health Sciences, SRM Institute of Science and Technology, NCR Campus, Delhi-Meerut Road, Modinagar, Ghaziabad, 201204, Uttar Pradesh, India

[2]Ravi Shankar College of Pharmacy, Bhanpur Bypass Road, Near Peoples Dental College, Bhopal -462010, Madhya Pradesh, India.

Corresponding author: sk1494@srmist.edu.in

Abstract

Argyreia nervosa (Convolvulaceae) and *Parthenium hysterophorus* (Asteraceae) are medicinally and ecologically significant plants, respectively, with contrasting ethnopharmacological profiles. *A. nervosa* is widely recognized for its therapeutic potential in traditional medicine, while *P. hysterophorus* is regarded as an invasive weed with documented toxicological concerns, though recent studies suggest possible pharmacological activities. This study undertakes a comparative phytochemical evaluation of both species to investigate the qualitative and quantitative distribution of bioactive constituents. Standard phytochemical screening methods were employed to detect major classes of secondary metabolites, including alkaloids, flavonoids, tannins, saponins, phenolics, and glycosides. Preliminary results indicate that *A. nervosa* is rich in alkaloids, flavonoids, and phenolic compounds that correlate with its reported antioxidant and therapeutic properties. In contrast, *P. hysterophorus* exhibits significant levels of sesquiterpene lactones, phenolics, and saponins, which may account for both its allelopathic and potential pharmacological activities. The comparative analysis highlights the phytochemical diversity between the two species, providing insights into their distinct biological roles, including therapeutic versus invasive properties, and offering a basis for further pharmacological, toxicological, and molecular investigations. This study highlights the importance of systematic phytochemical evaluation in exploring the dual potential of plants as sources of novel drugs and as ecological threats.

Keywords: Argyreia nervosa, Parthenium hysterophorus, ethnomedicine, phytochemical evaluation, ethnopharmacology, invasive weed, toxicology.

Synthesis of Furan-Fused Imidazopyridine Derivatives towards Identification of Potential Antibacterial Agents

Sandesh S. Sarjerao*

Shri Vaishnav Institute of Pharmacy, Shri Vaishnav Vidyapeeth Vishwavidyalaya (SVVV), Indore- 453111, M.P, India

Corresponding author: sandeshsarjerao312@gmail.com

Abstract

The alarming rise of multidrug-resistant bacterial strains has created a pressing need for new antibacterial agents with distinct structural frameworks. In this context, heterocyclic scaffolds, particularly imidazopyridines and their fused analogues, have emerged as promising candidates due to their diverse pharmacological potential. This work focuses on the design and synthesis of furan-fused imidazopyridine derivatives through annulation reactions involving α-carbonyl sulfoxonium ylides and arylidene-imidazopyridinone precursors. A series of structurally diverse fused heterocycles was synthesized and fully characterized by spectroscopic (^{1}H, ^{13}C NMR, IR) and spectrometric (HRMS) techniques. The strategic introduction of quinolone and other bioactive substituents aimed to enhance antibacterial activity. The synthetic approach offers efficient access to novel frameworks with good yields, demonstrating the utility of sulfoxonium ylides in constructing complex heterocyclic systems. The synthesized molecules are intended for biological evaluation as potential antibacterial agents against resistant pathogens.

Keywords: Arylidene-imidazopyridine, sulfoxonium ylide, annulation, multidrug resistance, SAR studies.

Nanomedicines in Metabolic Disorders: Exploring Innovative Nanotechnology-based approaches for the diagnosis and Treatment of metabolic diseases

Saumya Dubey, Harender Gehlaut, Shaweta Sharma*

Department Of Pharmacy, School of Medical and Allied Science, Galgotias University

Corresponding author: shawetasharma@galgotiasuniversity.edu.in

Abstract

Nanomedicines represent a transformative approach for the diagnosis and treatment of metabolic disorders, leveraging the unique physicochemical properties of nanotechnology-based systems to address the complex pathophysiology of diseases such as diabetes, obesity, and dyslipidemia. Metabolic disorders disrupt biochemical processes, impair energy balance, and contribute to chronic diseases and complications. Advanced nanomaterials—including polymeric nanoparticles, liposomes, nanostructured lipid carriers, and nucleic acid nanoparticles not only enhance drug bioavailability and stability but also enable precise, targeted delivery to affected tissues, thereby minimizing off-target effects and improving therapeutic outcomes.

Recent innovations center on the development of glucose-responsive nanocarriers, supramolecular vesicles, and hybrid nanogels for adaptive and sustained drug release, as well as the utilization of nanoparticles in gene therapy to modulate insulin production and metabolic pathways. These systems offer significant advantages, including the ability to protect genetic material, regulate gene expression, and facilitate oral delivery of therapeutics, improving patient compliance and reducing the need for invasive treatments. Furthermore, nanotechnology aids in early disease detection through sensitive nanosensors and enhances real-time monitoring, paving the way for personalized medicine approaches.

Despite promising preclinical results, clinical translation faces challenges related to manufacturing, safety, and regulatory approval, underscoring the need for further studies to optimize efficacy and biocompatibility. Nevertheless, the integration of nanomedicines into metabolic disorder management holds immense potential to revolutionize therapy, offering safer, more effective, and patient-friendly solutions for millions worldwide.

Keywords: Nanomedicines, metabolic disorder, recent innovation, Nanotechnology, innovative nanosystem.

Molecular Docking Studies of Some Aurone Derivatives as Anti-Malarial Agents

Piyushi Mishra*

Ujjain Institute of Pharmaceutical Sciences, Gram- Chandesra, Dewas Road, Ujjain-456010, M.P., India

Corresponding author: piyushimishra1522@gmail.com

Abstract

Malaria continues to pose a severe threat to world health. Antimalarial research so far has only examined inhibitors that work on single targets; multitargeting antimalarials are greatly wanted in order to address the issue of drug resistance. Many researchers were interested in aurones (AU) and their nitrogen analogs as a result. In this research, thirty aurone derivatives were subjected to molecular docking on cytochrome bc1 (PDB code: 3CX5, resolution 1.90 Å) and *P. falciparum* Lactate Dehydrogenase enzyme (PDB code:1LDG, resolution 1.74 Å) using Autodock software 4.2.6. Docked confirmation of ligands was analyzed for their binding interactions using 2D & 3D visualizations by Protein Plus software. The compounds AU-6, 8, 10, 18, and 24 demonstrated good docking inside the binding sites of the *Pf* LDH target, with binding energies ranging from -10.33 to -7.42 kcal/mol, according to the docking data. While π-π interactions were identified with Met30A and Gly99A, Analysis on the cytochrome bc1 site displayed hydrogen bond interactions with His345A, Met455A, whereas hydrophobic interactions were seen with Lys349A, having a dock score ranging from -6.23 to -5.41kcal/mol.

Keywords: Malaria, Plasmodium falciparum, Drug resistance, Aurones, Molecular docking.

Importance of Artificial Intelligence in the Drug Discovery of Natural Products

Ankita Priyadarshini Sahoo*, G S Chakraborthy

Parul Institute of Pharmacy and Research, Parul University, Vadodara, Gujarat- 391760

Corresponding author: sahooankitapriyadarshini@gmail.com

Abstract

Natural products (NPs) are a recognised source for new therapeutics due to their bioactivities, which are naturally optimized over evolutionary time, their structural diversity and unique chemical features that make them special scaffolds for engaging protein drug targets. The pharmaceutical industry has turned its attention away from NP discovery despite its significance in medicine due to the difficulties in identifying, characterizing, and creating novel compounds. Recent developments in artificial intelligence (AI), accelerated by high-performance computing, widely available software, and reasonably priced education, are reviving this discipline by offering innovative solutions to these problems. Specifically, natural language processing (NLP) and machine learning (ML) have become effective methods to speed up NP-based drug development. AI has demonstrated significant potential in genome and metabolome mining, predicting biosynthetic gene clusters and connecting genetic information to chemical structures, and sophisticated algorithms help with target prediction, bioactivity evaluation, and structural characterization of natural compounds, reducing the need for time-consuming experimental screening. Advancements in neural networks, including deep learning, increase NP discovery by boosting biosynthesis, creating new routes and enabling compound reuse. Additionally, AI improves the identification and structural elucidation of unknown metabolites from difficult raw datasets like nuclear magnetic resonance and mass spectrometry, strengthening analytical workflows. However, creating and selecting large-scale, high-quality datasets to train reliable models continues to present difficulties. To increase the accuracy of AI-driven predictions, problems including algorithmic bias, overfitting, and repeatability need to be properly addressed. All things considered, incorporating AI into NP research presents revolutionary chances to elucidate new therapeutic candidates, stimulate combinatorial design, and eventually accelerate the creation of next-generation therapeutics.

Keywords: Natural products, artificial intelligence, machine learning, drug discovery.

Nanomedicine: An Emerging Tool in Healing Chronic Wounds and Its Opportunities

Arsh Chanana*, Dr Ravindra Pal Singh

Department of Pharmaceutics, NIMS Institute of Pharmacy, NIMS University Rajasthan Jaipur

Corresponding author: arshchanana806@gmail.com

Abstract

Chronic wounds generally take a lot of time to recover, which becomes a cause of worry for the patient and also becomes difficult to manage them. Chronic wound affects the minds of millions of people worldwide which resulting in a high mortality rate. Nanomedicine has emerged as a promising tool in addressing the issue of chronic wounds. Nanomedicine in chronic wound healing holds the potential to revolutionize wound care by offering various personalized treatments and improving patient outcomes. Advanced wound dressings and nanofibres scaffolds promote tissue regeneration and which also accelerates wound closure. Nanomedicine is also able to provoke the various cellular and molecular mechanisms that are involved in the wound microenvironment. Showing the anti-inflammatory, antibacterial, and angiogenetic effects. Gene therapy and various inflammation modulation using this emerging tool of nanotechnology show promising results in managing various chronic wounds. Nanomedicine offers innovative approaches to address these challenges. Nanomedicine also plays a crucial role in tissue engineering, which can also be used for chronic wound treatment. Nanotechnology which has enabled the various developments of the advanced wound dressings and has improved various properties. Nanomedicine also uses antimicrobial nanomaterials, such as silver nanoparticles, to combat various infections in chronic wounds. The main aim of the review is to provide a concise overview of nanomedicine as a recent tool in healing chronic wounds and also its various opportunities for curing of chronic wounds.

Keywords: Nanomedicine, angiogenesis, chronic wounds, wound healing.

Phytochemical-Driven Nano Medicine: A Green Revolution in Diabetes Therapy

Deepansh Kumar*

[1]School of Pharmaceutical Science and Technology, Sardar Bhagwan Singh University,

Balawala, Dehradun, Uttarakhand 248001

Corresponding author: deepanshbhardwaj023@gmail.com

Abstract

Diabetes mellitus is a chronic metabolic condition defined by high blood glucose levels (hyperglycemia) caused by abnormalities in insulin secretion, action, or both. It is a worldwide health challenge that necessitates novel and long-term therapy techniques beyond traditional pharmacological approaches. Phytochemical-driven nanomedicine is a ground-breaking combination of natural plant-based substances and modern nanotechnology, providing a green and effective alternative to diabetes care. Phytochemicals such as flavonoids, alkaloids, terpenoids, and polyphenols have considerable antidiabetic characteristics, including improving insulin production, glucose absorption, inhibiting carbohydrate-digesting enzymes, and protecting pancreatic β-cells. Although phytochemicals have great medicinal promise, their efficacy may be hampered by poor water solubility, low bioavailability, and fast degradation in the body. Nanotechnology provides a potent answer to these issues by allowing for the encapsulation and controlled administration of phytochemicals via nanoscale carriers like nanoparticles, liposomes, nano emulsions, and polymer nanostructures. These innovative delivery techniques improve the stability, absorption, and overall therapeutic effectiveness of phytochemicals while minimizing undesirable effects. Recent research shows that nano-encapsulated substances such as curcumin, resveratrol, and quercetin can help regulate blood glucose levels and improve insulin sensitivity. This green revolution in diabetes medication combines the safety and efficacy of natural chemicals with the accuracy of nanotechnology, paving the way for next-generation, environmentally friendly, patient-centred treatments. Phytochemical-driven nanomedicine has the potential to reshape the future of diabetic care.

Keywords: Diabetes Mellitus, Nanomedicine, Phytochemical, Revolution.

IM-HST/2025/028

Emerging Role of Flavonoids in the Management of Ulcerative Colitis

Megha Giri*, Akanksha Sayana, Dr. Swati

[1]School of Pharmaceutical Science and Technology, Sardar Bhagwan Singh University, Balawala, Dehradun, Uttarakhand 248001

Corresponding author: meghagiri2918@gmail.com

Abstract

Ulcerative colitis is a chronic inflammatory bowel disease that is on the rise globally and significantly impairs patients' quality of life. Despite advancements in pharmacotherapy, the current treatments still have problems like side effects, the possibility of recurrence, and high costs. As a result, there is now more interest in natural substances with safer and more varied effects. Widely distributed polyphenols produced from plants, flavonoids, are increasingly being identified as possible therapeutic agents.

Recent studies have found that flavonoids have strong anti-inflammatory and antioxidant effects, improve gut flora, and maintain the integrity of the intestinal barrier. They also regulate crucial molecular pathways like NF-κB and MAPK to reduce colonic inflammation and promote mucosal repair. thereby promoting mucosal repair and reducing colon inflammation. Several compounds, including quercetin, luteolin, apigenin, and naringenin, have shown remarkable effectiveness in preclinical UC models, lowering symptoms and restoring immunological balance. Flavonoids' multitargeted approach, which targets multiple processes rather than just one, is what makes them special. As a result, they are marketed as potential additions to or replacements for conventional therapy, which could improve the management of chronic illnesses.

Keywords: Ulcerative colitis, microbiome, flavonoids, antioxidant, NF-κB inflammation.

In-vivo activity of Mannose Coated Nitazoxanide Nanospheres for Liver Fibrosis

Shekhar Singh*, Km Kulsoom Bano

Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Lucknow-226028. India

Corresponding author: shekharsingh47@gmail.com

Abstract

Currently, conventional therapies via oral and other routes for the treatment of hepatic fibrosis have various limitations and lack targeted therapy. To overcome these barriers, a site-specific treatment to the liver is needed. Thus, the present study aimed to perform *in-vivo* studies of Mannose-coated Nitazoxanide-loaded nanospheres for liver fibrosis. Nanospheres were prepared by the solvent diffusion method using Poly lactic acid and Poly vinyl alcohol. The optimization study was performed by Box Behnken design. The optimized batch was coated with mannose to target the liver. The pharmacological study was performed on healthy male adult Wistar rats of weight 150-250 gm, divided randomly into five groups with five animals each, i.e., Group 1(positive control), Group 2 (standard) and Group 3 (test formulation), Group IV (Marketed drug), and Group V (Drug solution). The carbon tetrachloride-induced liver fibrosis model was used. On the day CCl_4 was administered the formulation was intravenously administered through tail vein of rats two hours before CCl_4. After nine days, the blood sample was collected and used for biochemical analysis. Histopathological assessment was done on liver to analyse the changes on all the groups. Rats treated with Mannose-coated Nitazoxanide-loaded nanospheres demonstrated significantly lowered liver hydroxyproline levels, demonstrating a reduction of collagen accumulation in the fibrotic liver as compared to the positive control group ($p<0.05$), Similar effects were seen in the Group IV treated rat also. The histopathological examination of the liver among the groups revealed significant results with the developed nanospheres. Therefore, it may be concluded that mannose-coated Nitazoxanide nanospheres can be an alternative approach for site-specific delivery of drugs in liver fibrosis.

Keywords*:* Nitazoxanide, Liver fibrosis, Nanospheres, Mannose.

IM-HST/2025/030

Formulation and Evaluation of Extended-Release Bilayer Tablets Containing Empagliflozin and Metformin Hydrochloride for Diabetes Mellitus Management

Krishna Deore*, Mohammad Ismail Mouzam

Y. B. Chavan College of Pharmacy, Chhatrapati Sambhajinagar, Maharashtra, India

Corresponding author: krishnadeore.123@gmail.com

Abstract

This study systematically evaluates the formulation development of bilayer tablets combining empagliflozin and metformin hydrochloride for diabetes mellitus management. The formulation design encompassed drug-excipient compatibility, flow characteristics, and the development of immediate and extended-release layers. Differential scanning calorimetry (DSC) confirmed compatibility between empagliflozin, metformin hydrochloride, and selected excipients (HPMC and Avicel), showing no significant variations in onset and peak melting points after 4 weeks of incubation. Flow properties were assessed and demonstrated excellent flow characteristics suitable for tablet formulation. Both pre- and post-compression analyses were found to be within pharmacopoeial limits. In an attempt to define the best formulation parameters, a concept known as central composite design (CCD), as well as full factorial design (FD) was used. CCD experiments pointed to the strong impact of hydroxypropyl cellulose and croscarmellose content on the tableting properties. It was useful while employing the FD method in conducting a comprehensive evaluation of several factors affecting empagliflozin formulation to accomplish optimization. This detailed investigation underscores the importance of systematic assessments in formulating bilayer tablets with empagliflozin and metformin hydrochloride, ensuring stability, efficacy, and compliance, ultimately contributing to advancements in drug delivery systems and improved patient outcomes.

Keywords: Drug-excipient compatibility, Differential scanning calorimetry (DSC), central composite design (CCD), factorial design (FD).

IM-HST/2025/031

Novel Micro-emulsion-based Synthesis of Silver Nanoparticles using Citrus bergamia Essential Oil for Breast Cancer

Pooja Santosh Murkute*

Maulana Azad Educational Trust Y.B. Chavan College of Pharmacy, Aurangabad, Maharashtra

Corresponding author: murkute.s.pooja88@gmail.com

Abstract

By considering the alleged advantages of triterpenoidal-derived phytochemicals for the environment and human health, natural preservatives as opposed to synthetic ones are becoming more and more popular for preserving the quality and safety of food. Bergamot oil, a plant essential oil and extract that contains a high concentration of flavonoids such as neoeriocitrin, neohespiridin, and naringenin are primary preparation employed. Tri-terpenoidal-derived phytochemicals, Tween 80, PEG-400 and (0.01N) $AgNO_3$ were selected to prepare antibacterial silver nanoparticles. The silver nanoparticle was prepared by using the micro-emulsification technique by using high-speed homogenization and then it is transferred for drying purposes to allow free-flowing nanoparticles. Particle size, PDI and zeta potential measurement, Morphological Evaluation (Field Emission Scanning Electron Microscope (FE-SEM)), FTIR Spectroscopy analysis, and antimicrobial study was used to evaluate the prepared silver nanoparticles. Particle size, PDI and zeta potential measurement gives significant particle size value of 151 nm , 0.300 PDI and 34 mV. Different zones of inhibition (mm) were recorded for different sample concentrations, as per reported data generated. Bergamot oil-containing microemulsion-based Silver nanoparticles show considerable antibacterial effect, followed by activity against MCF-07 cell line.

Keywords: Antimicrobial study, Triterpenoid glycoside, Bacillus substillus, Silver-Naoparticle, MCF-07 cell line study

Polyherbal formulation for enhanced wound healing

Preeti Sharma*[1], Satish sardana[1], Monika Sachdeva[2]

[1]Amity institute of pharmacy, Amity University Haryana Gurugram

[2]Raj Kumar Goel Institute of Technology, Ghaziabad, affiliated to Dr APJ AKTU, Lucknow

Corresponding Author: ssardana@ggn.amity.edu

Abstract

Many studies on advanced wound care have been conducted worldwide, but wound healing is still an unmet therapeutic challenge and a major clinical and financial burden on medical society. Nowadays, there are countless wound healing products and techniques accessible. Systemic adverse effects such crystalluria, hemoglobinemia, renal impairment, ototoxicity, and renal/thyroid dysfunctions can occur from some of these products, which contain synthetic chemical moieties like betadine, chlorhexidine, etc. Even advanced wound healing treatments, such bioengineered cellular wound therapies and stem cell therapies, have drawbacks. For example, they are not affordable for the average person, and getting enough stem cells might be challenging because of their poor regeneration potential and ethical issues. The use of medicinal plants in wound treatment is becoming more popular due to the drawbacks of the current wound healing techniques. The main cause of the increased interest in therapeutic plants was scientific progress in identifying the fundamentals and molecular processes underlying the roles played by different phytoconstituents in them. Several medicinal plants are carefully combined to create polyherbal formulations (PHFs), such as Ari's wound healing cream, herboheal, and Ankaferd, which are said to be safe and effective when compared to using a single plant. The multitargeted, synergistic, and complementary contributions of specific phytoconstituents in the PHFs at various complicated stages of wound healing need to receive the attention they deserve. Numerous reviews on the wound healing properties of individual plants and PHFs have been published. The purpose of this paper is to present a thorough analysis of the latent potential of the beneficial herb-herb combination as a potentially effective wound-healing strategy. Our goal is to methodically gather research, evaluate papers from different open access research databases, and analyze them in order to highlight the key characteristics of PHFs in connection to efficient wound care. Since several of the phytoconstituents in PHF can work in concert to address several wound healing processes at once, a composite medication strategy is a preferable choice for better wound care. According to reports, they work well against bacteria that are resistant to many drugs by preventing the development of sophisticated quorum-sensing-regulated virulence factors, which ultimately results in the organism's demise.

Keywords: Chronic Wound, Medicinal Plant, Phytoconstituent, Polyherbal Formulation, Wound Healing.

IM-HST/2025/033

Quantitative Structure-Activity Relationship (QSAR) Studies of Some Thiosemicarbazone Derivatives as Anti-malarial Agents

Priyanka Singh*

Shri Vaishnav Institute of Pharmacy, Shri Vaishnav Vidyapeeth Vishwavidyalaya (SVVV), Indore- 453111, M.P, India

Corresponding author: singhpriyanka548@gmail.com

Abstract

In the research, twenty-four analogues having variable inhibition against the *Plasmodium falciparum* chloroquine-resistant Dd2 strain were subjected to quantitative structure-activity relationship analysis. Various molecular descriptors were calculated using ChemoPY molecular modeling software. QSAR models were generated employing a sequential multiple linear regression method using the in-house statistical program VALSTAT. Statistically significant models with an r-value of 0.90 were obtained for both activities. Models were validated using leave-one-out and bootstrapping methods. Results obtained shows that a detailed correlation ($r=0.880$, $r^2=0.774$, $q^2=0.679$ and $r^2_{pred}=0.717$; *Pf*CQ^R Dd2) and demonstrate its statistically significances how the various substituents might affect the viability of parasite cells. Findings of present study reveal that electron donating groups such as methyl and methoxy substituent on the quinoline ring and phenyl or p-methyl phenyl substituent at thiosemicarbazide ring are most favorable for anti-malarial activity.

Keywords: 3D-QSAR, Sequential multiple linear regressions (MLR), Malaria, *Plasmodium falciparum,* chloroquine resistant (CQ^R), Quinoline-thiosemicarbazone.

Stability Indicating RP-HPLC Assay Method Development and Validation for the Simultaneous Estimation of Esomeprazole and Methotrexate

Rashmi Dorai*, Dr. Anurag Mishra

NIMS Institute of Pharmacy, NIMS University, Rajasthan, Jaipur

Corresponding author: rashmi.dorai@nimsuniversity.org

Abstract

A simple, rapid, sensitive, and cost-effective reverse-phase high-performance liquid chromatographic technique was developed and validated for the simultaneous estimation of Esomeprazole (ESP) and Methotrexate (MTX). The chromatographic separation was achieved by using an X-bridge phenyl (250×4.6) mm, 5µm chromatographic column and a mobile phase consisting of Acetonitrile and 0.1% Formic acid in water in a ratio of (30:70) v/v at a flow rate of 1 ml/min. The detection was carried out at a wavelength of 273 nm with a constant injection volume of 10 µL throughout the analysis. The calibration curve for ESP was observed to be linear over the optimum concentration range of 50–300 µg mL^{-1}, with an R^2 value of 0.99984, whereas the calibration curve for MTX was observed to be linear over the optimum concentration range of 50-150 µg mL^{-1}, with an R^2 value of 0.99969. The developed method was validated as per the ICH Q2 (R1) guideline. ESP and MTX were evaluated under stressed conditions, including acidic, basic, oxidative, reductive, thermal, hydrolytic and photolytic conditions, as per ICH Q1 (R2) guidelines. Significant degradation was observed in acidic, reductive and oxidative degradation conditions. Conversely, both the drugs showed stability when exposed to basic, hydrolytic and thermal degradation conditions.

Keywords: Reverse-phase HPLC, Esomeprazole, Methotrexate, Method validation, Forced degradation studies.

IM-HST/2025/035

Ethnopharmacology, Phytochemistry, Pharmacological Insights of *Angelica glauca* Edgew. from the Western Himalaya

Somesh Thapliyal*

Department of Pharmaceutical Sciences, Hemvati Nandan Bahuguna Garhwal University (A Central University), Srinagar Garhwal, Uttarakhand

Corresponding author: somesh.thapliyal@gmail.com

Abstract

Angelica glauca Edgew., commonly referred to as Choru, is an endangered aromatic and medicinal herb that belongs to the Apiaceae family. This species is endemic to the Western Himalayas, particularly in the regions of Uttarakhand, Himachal Pradesh, and Jammu & Kashmir. Historically, A. glauca has been used in traditional medicine to address digestive disorders and respiratory ailments, as well as serving as a culinary spice. The rhizomes of *A. glauca* are known to be rich in essential oils, terpenoids, and coumarins, which collectively show a variety of pharmacological properties. These include antioxidant, antimicrobial, anti-inflammatory, and carminative effects. However, the species is currently facing a significant decline in population due to overharvesting and habitat loss, resulting in its classification as critically endangered in regional assessments. This review seeks to critically assess the ethnopharmacology, phytochemical composition, and pharmacological attributes of *A. glauca*. Special attention is given to the importance of integrating traditional knowledge with contemporary pharmacological validation, thereby contributing to the understanding and preservation of this valuable species.

Keywords: Angelica glauca, Choru, Apiaceae, Ethnopharmacology, Phytochemistry, Pharmacology.

IM-HST/2025/036

Effect of different drying approaches on the yield and volatile constituents of *Eucalyptus citriodora* oil

Deeksha Tokas*, Dr. Priyanka Rohatgi

School of Pharmaceutical Sciences and Technology, Sardar Bhagwan Singh University, Balawala, Dehradun

Corresponding author: tokasdeeksha@gmail.com

Abstract

Eucalyptus citriodora is an aromatic species of the Myrtaceae family, valued for its essential oil rich in oxygenated monoterpenes, which have extensive applications in pharmaceutical and agricultural products as well as in traditional medicine for respiratory disorders.

The yield and composition of essential oils in aromatic plants are strongly influenced by drying techniques. The objective of our study is to investigate the effects of different drying methods on the essential oil of *E. citriodora*.

Essential oils were extracted from fresh, sun-dried, and shade-dried leaves by using the Clevenger apparatus. Results showed significant variation in oil yield. The volatile oil obtained from each sample was analysed by using Gas Chromatography-Mass Spectrometry (GC-MS).

A several key phytoconstituents were identified in the essential oils obtained from leaves subjected to different drying methods. Among them, α-pinene, β-pinene, 1,8-cineole, Dlimonene and globulol were the prominent components. The oils were predominantly rich in monoterpenes accompanied by sesquiterpenes. In fresh leaves, eucalyptol (15.71%) and βpinene (10.96%) were detected in highest amount. D-limonene (9.83%) showed unique presence in shade-dried leaves. Thus, the chemical profile varied significantly with the drying methods, with the fresh sample exhibiting the highest diversity and concentration of key bioactive compounds, particularly β-pinene and eucalyptol.

Keywords: *Eucalyptus citridora*, essential oil, drying, GC-MS, eucalyptol.

IM-HST/2025/037

Beyond Cas 9: The diversification and broadening application of CRISPR-Cas Systems

Komal Sharma*, Dr. Swati

School of Pharmaceutical Sciences and Technology, Sardar Bhagwan Singh University, Balawala, Dehradun

Corresponding author: ks3088902@gmail.com

Abstract

Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) and their associated Cas proteins has sparked a biotechnological revolution with profound impacts in the field of biology, medicine, agriculture, and global health. In the biomedical field, CRISPR promises to provide precise solutions for oncology, antimicrobial resistance management, immunotherapy, and rare genetic disorders, as well as enabling ultra-sensitive diagnostic platforms for infectious and non-infectious diseases. In the agricultural field, CRISPR has transformed crops through genetic engineering, helping to improve yield, resistance, and adaptability.

Cas9 have many Cas variants such as Cas12a, Cas13, Cas14 and others expanded the editing, diagnostic, and regulatory applications of CRISPR, offering greater flexibility and specificity.

Cas9 will remain a foundation of genome editing, the emergence of Cas12, Cas13, Cas14, and other engineered variants has expanded the toolbox, addressing Cas9's shortcomings and opening the new frontiers in research, therapeutics, and diagnostics.

Researchers are working on refining this system for greater accuracy, controllability, and safety for the genetic engineering. This explores the transformative diversification and broadening application of CRISPR-Cas Systems across many fields. Beyond Cas9, diversification into Cas12, Cas13, Cas14, and engineered variants is highlighted, showcasing how expanding the CRISPR toolbox is essential for achieving greater accuracy, safety, and versatility in genome editing.

Keywords: CRISPR, Diversification, CAS 9, Revolution.

Phytochemical Profiling, Bioactivity-Guided Fractionation, and Evaluation of Hypoglycemic and Antioxidant Potential of Crossandra infundibuliformis in *in Vitro* and *in Vivo* Models

Priya Mijgar[1], Uday Deokate[2]

[1]Department of Pharmacognosy, Government College of Pharmacy, Chhatrapati Sambhajinagar.

[2]Department of Pharmaceutical Chemistry, Government College of Pharmacy, Karad

Corresponding author: priyamulgir@gmail.com

Abstract

Background: *Crossandra infundibuliformis*, a traditionally used medicinal plant, was investigated for its phytochemical composition, antioxidant capacity, and hypoglycemic potential using bioactivity-guided fractionation and experimental models.

Methods: Different preparations of the stem of C. infundibuliformis were subjected to phytochemical screening, fluorescence analysis, and quantitative assessment of total flavonoid and phenolic content. Inhibition tests for DPPH, α-amylase, and α-glucosidase were used to measure antioxidant activity. Following OECD criteria, the acute oral toxicity was assessed. The study examined many parameters in diabetic Wistar rats that had been induced with streptozotocin (STZ), including the oral glucose tolerance test (OGTT), body weight monitoring, blood glucose estimate, serum insulin levels, and antioxidant enzyme activity (SOD, CAT, GSH, MDA).

Results: ethanolic extract showed high phenolic (241.28 µg/mL) and flavonoid (333.38 µg/mL) content. The ethyl acetate fraction exhibited potent DPPH radical scavenging activity (99.19%) and α-amylase inhibition (59.35%), while the n-butanol fraction inhibited α-glucosidase (77.24%) comparably to acarbose. OGTT revealed a significant reduction in glucose levels from 161.00 ± 4.36 mg/dL (15 min) to 93.67 ± 2.08 mg/dL (120 min). Long-term treatment reduced blood glucose from 241.5 ± 2.43 mg/dL (Day 7) to 126.3 ± 10.25 mg/dL (Day 28) and elevated serum insulin to 820 ± 96.22 pg/mL. Antioxidant enzyme levels improved significantly, with increased SOD, CAT, GSH, and decreased MDA.

Conclusion: *Crossandra infundibuliformis* confirmed substantial antioxidant and hypoglycemic properties in both models, associate its traditional use and potential as a candidate for antidiabetic phytomedicine development.

Keywords: *Crossandra infundibuliformis*, phytochemical screening, DPPH, α-amylase inhibition, α-glucosidase inhibition, STZ-induced diabetes, serum insulin, oxidative stress.

IM-HST/2025/039

Neuroprotective Effects of Grewia asiatica Linn Extract Against AlCl3-Induced Oxidative Damage in Rats

Shalu Saini[1*], Yogita Dobhal

Department of Pharmacology, Sardar Bhagwan Singh University, Balawala, Dehradun 248161, Uttarakhand, India

Corresponding author: shalusaini5786@gmail.com

Abstract

Grewia asiatica is a nutritional plant belongs to family Tiliaceae, possesses diverse biological activity, including antioxidant, antimicrobial, laxative, antifungal etc. In this study, the protective effect of hydroalcoholic extract of *Grewia asiatica* leaves (GALE) were evaluated in Aluminium chloride ($AlCl_3$) induced acute neurotoxicity in rats. Wister albino rats were orally fed with (100,200 and 500 mg/kg body wt.) along with administration of $AlCl_3$ (100mg/kg body wt. orally) for 14 days. The result showed that the treatment of GALE significantly reduce the level of LDH, acetylcholinesterase, LPO and increase the level of GSH and SOD. The activity of leaf extract at the dose of 500 mg/kg was comparable to the standard drug, Donepezil. Therefore, the outcome of study suggested that GALE could protect brain against $AlCl_3$ induced oxidative damage in rats, and thus helps in evaluation of traditional claim on this plant. So, there is a urgent need to timely recognition of enormous medicinal application of this plant.

Keywords: Neurotoxicity, *Grewia asiatica*, aluminium chloride, antioxidant, hydroalcoholic.

Computer-Aided Drug Design versus Traditional Drug Development: A Comparative Perspective in Encephalitis Treatment

Pawan Kumar Gupta*, Shashi Bhooshan Tiwari

Department of Pharmacy, Mahatma Jyotiba Phule Rohilkhand University, Bareilly, Uttar Pradesh, India 243006

Corresponding author: pawan22gupta97@gmail.com

Abstract

Encephalitis is a severe neurological disorder caused by viral, bacterial, or autoimmune factors, for which current therapeutic options remain limited by drug resistance, systemic toxicity, and inadequate blood–brain barrier (BBB) penetration. Traditional drug development, based on trial-and-error screening, is time-consuming, costly, and associated with high attrition rates. In contrast, Computer-Aided Drug Design (CADD) offers a rational, target-focused strategy using molecular docking and ADMET prediction to optimize efficacy and safety. This study compared established drugs (acyclovir, ganciclovir, ceftriaxone) with rationally designed isatin-derived scaffolds (Ligand-A, Ligand-B, Ligand-C) against the tumor necrosis factor-alpha (TNF-α) receptor using a standardized computational workflow. Docking results revealed that CADD-designed ligands exhibited stronger binding affinities (−9.3 to −9.1 kcal·mol^{-1}) compared to traditional agents (−8.6 to −5.9 kcal·mol^{-1}), with Ligand-A emerging as the top candidate. ADMET predictions further highlighted Ligand-A as favorable, with high BBB permeability, good gastrointestinal absorption, and low predicted toxicity, while Ligand-B showed potential hepatotoxicity. Collectively, these findings suggest that CADD-derived ligands can overcome key limitations of conventional drugs by enhancing specificity, safety, and CNS penetration. However, a critical research gap remains in translating *in silico* predictions into clinically validated therapies, underscoring the need for integrative studies bridging computational design with experimental pharmacology and clinical trials.

Keywords: Computer-Aided Drug Design, Encephalitis, Traditional Drug, Molecular docking, ADMET study.

IM-HST/2025/041

Type 3 Diabetes Mellitus: The Intersection of Metabolic Dysfunction and Neurodegeneration

Nilanchala Sahu*

School of Pharmacy, Sharda University, Greater Noida, Uttar Pradesh, India, 201310

Corresponding author: nilanchala.sahu@sharda.ac.in

Abstract

Type 3 Diabetes Mellitus (T3DM) is a complex and emerging condition that links the metabolic disturbances of diabetes with neurodegenerative processes, most notably Alzheimer's disease. This chapter offers an in-depth analysis of T3DM by exploring its underlying molecular and biochemical pathways, clinical symptoms, diagnostic difficulties, and available treatment options. Central to this discussion is the role of brain insulin resistance, disrupted glucose metabolism, oxidative damage, and chronic inflammation as major drivers of neuronal decline. Additionally, the chapter reviews recent progress in identifying biomarkers, advances in brain imaging techniques, and novel pharmacotherapies designed for early diagnosis and effective management. By synthesizing contemporary scientific insights, clinical data, and future research directions, this chapter aims to clarify the importance of recognizing T3DM as a unique clinical condition within the broader context of metabolic and cognitive health challenges.

Keywords: Type 3 Diabetes Mellitus, Metabolic Dysfunction and Neurodegeneration

IM-HST/2025/042

Global Burden and Novel Interventions for Type 2 Diabetes Mellitus: From Epidemiology to Molecular Insights

Neerja Kumari*

School of Pharmacy, Sharda University, Plot no 32,34, Knowledge Park-III, Greater Noida, Uttar Pradesh 201310, India

Corresponding author: neerja.kumari@sharda.ac.in

Abstract

Diabetes mellitus, particularly Type 2 Diabetes Mellitus (T2DM), is a major global health challenge affecting millions of individuals. The condition arises from impaired pancreatic β-cell function, insulin resistance, and progressive metabolic dysregulation. Current statistics reveal that approximately 537 million adults are living with diabetes worldwide, with projections estimating up to 783 million cases by 2045. The disease burden is disproportionately higher in low- and middle-income countries, where nearly half of the affected population remains undiagnosed. Persistent hyperglycaemia contributes to severe complications, including cardiovascular disease, chronic kidney disease, and neuropathies, thereby increasing morbidity and mortality.

Recent research has highlighted the role of free fatty acids, glucotoxicity, and lipotoxicity in accelerating β-cell dysfunction. In addition, several molecular targets have emerged as promising therapeutic interventions. These include short-chain fatty acid receptors (FFA2/FFA3), G-protein coupled receptors (GPR119, GPR120), glucose transporter type 4 (GLUT-4), peroxisome proliferator-activated receptor gamma (PPAR-γ), and protein tyrosine phosphatase 1B (PTP1B). Advances in regenerative medicine, nanotechnology, and herbal approaches further provide opportunities for developing novel strategies against T2DM. Targeting these pathways offers potential for improving insulin sensitivity, glucose uptake, and overall glycaemic control.

This review consolidates epidemiological data, mechanistic insights, and emerging molecular targets in T2DM, underscoring the urgent need for integrated therapeutic approaches to combat its escalating prevalence and complications.

Keywords: Type 2 Diabetes Mellitus, Insulin Resistance, Hyperglycaemia, Free Fatty Acids, GLUT-4, PPAR-γ, Protein Tyrosine Phosphatase 1B.

IM-HST/2025/043

Exploring *Caesalpinia Pulcherrima* Galactomannan as a Natural Prebiotic

Nilima Abhijeet Thombre*

MET's Institute of Pharmacy, Bhujbal Knowledge City, Adgaon, Nasik-422003, Maharashtra, India (Savitribai Phule Pune University)

Corresponding author: nilimat_iop@bkc.met.edu

Abstract

The study aimed to determine the prebiotic potential of *Caesalpinia pulcherrima* galactomannan powder. According to research, *Caesalpinia pulcherrima* contains more amount of protein. It contains various pharmaceutical and nutraceutical values. Various pharmacological activities of *C.pulcherrima L.* have been reported such as analgesic and anti-inflammatory, antiulcer, antimicrobial activity, antibacterial and antifungal activity, antitumor, cytotoxic activity, astringent, abortifacient, emmenagogue, selective activity against DNA Repair-Deficient Yeast Mutants.

Need and Objective: As per the literature referred to, Prebiotics are considered as the food for the gut microflora. Healthy gut flora plays an important role in human and animal health homeostasis through the regulation of various biochemical pathways. So, it was thought that *Caesalpinia pulcherrima* galactomannan if proven for prebiotic potentials could be explored in products for therapeutic health management and nutritious feed.

Methodology: Hence the present study was planned on *Caesalpinia pulcherrima* galactomannan powder. *In-vitro* microbiological study for determination of simulated stomach and intestinal conditions to determine the acid resistance and prebiotic potentials. Probiotics (*Lactobacillus plantarum)* proliferation studies were performed with and without enzymes as well as with and without antibiotic.

Conclusion: It was concluded from the present research work that the *Caesalpinia pulcherrima* galactomannan powder has variable responses in terms of prebiotic potential. The prebiotic study proved that it was an excellent *in-vitro*, cost-effective alternative to prove the prebiotic potential of the *Caesalpinia pulcherrima* galactomannan powder. Moreover, *Caesalpinia pulcherrima* galactomannan powder can be used as a functional food in the form of a cost-effective therapeutic immune boosting supplement as it was revealed as an excellent prebiotic candidate in the present research work.

Keywords: *Caesalpinia pulcherrima* galactomannan powder, analgesic and anti-inflammatory, antiulcer, antimicrobial activity, antibacterial and antifungal activity.

Healing Without Pills: Herbal Patches as a Natural Digestive Aid

Rishabh Gupta*, Swati Sharma, Dr. Satyender Kumar

Sharda University, Knowledge Park III, Greater Noida, Uttar Pradesh, 201310, India

Corresponding author: 2022472592.rishabh@ug.sharda.ac.in

Abstract

This study focused on the design and evaluation of an innovative transdermal patch preparation of *Citrullus colocynthis* as a natural and safe substitute for traditional oral laxatives for the regulation of the gastrointestinal tract were the aims of this study. A hydroalcoholic extract of *C. colocynthis* was standardized and screened phytochemically, and the presence of cucurbitacins, flavonoids, and glycosides for the laxative activity was asserted. Herbal patches were designed by the solvent casting method with appropriate polymers (HPMC, PVP), plasticizers (PEG-400, glycerol), and permeation enhancers (menthol, oleic acid).

The preformulated patches were evaluated for physicochemical properties such as thickness, tensile strength, folding endurance, moisture balance, and uniformity of drug content. In-vitro release studies exhibited a controlled and prolonged release of the drug within 24 hours, and skin permeation studies confirmed efficient transdermal drug delivery of active phytoconstituents. In-vivo pharmacological assessment in animal models indicated increased gastrointestinal motility and fecal output when compared to control and orally treated groups, and no skin irritation was caused.

In conclusion, the results confirm *C. colocynthis* herbal patches as a new natural therapeutic agent for constipation and gastrointestinal control. The preparation overcomes the drawbacks of oral laxatives in terms of enhancing bioavailability, inhibiting gastrointestinal irritation, and improving compliance, which makes it a safe and innovative treatment strategy.

Keywords: *Citrullus colocynthis*, Herbal patch, Constipation, Natural laxative, Transdermal Drug Delivery.

The Role of Artificial Intelligence in Precision Drug Therapy

Sayan Dey*, **Dr. Priya Sharma, Dr. Satyender Kumar**

Sharda University, Knowledge Park III, Greater Noida, Uttar Pradesh, 201310, India

Corresponding author: 2022006386.sayan@ug.sharda.ac.in

Abstract

The incorporation of Artificial Intelligence into precision drug therapy is revolutionizing contemporary medicine by making treatments more precise, efficient, and personalized. Conventional drug therapy tends to use standardized methods that do not consider the heterogeneity of genetic makeup and lifestyle variations among individuals. Artificial intelligence technologies like machine learning and natural language processing fulfil this deficit by examining large databases, such as genomic data, clinical records, and real-time health records. These functions enable AI to forecast responses to drugs, determine the best therapeutic regimens, and minimize ADR hazards. Current progress points to the use of AI in speeding up drug discovery, rationalizing drug–drug interaction prediction, and improving pharmacogenomics so that treatments can be matched with unique genetic patterns. Clinical decision support systems supported by AI are now helping medical professionals individualize treatment regimens for optimal effectiveness while avoiding adverse effects. Furthermore, AI-supported pharmacovigilance systems enhance the safety of patients by tracking outcomes of treatment and recognizing initial warning signs. This paper studies the role of AI in the field of precision drug therapy, highlighting innovations, applications, limitations, and directions toward the future of truly personalized healthcare.

Keywords: Artificial Intelligence (AI), Precision Medicine, Personalized Healthcare, Machine Learning.

Assessment of Cytotoxicity of *Cuscuta reflexa* and *Syzygium cumini* in HepG2 Cell Lines, and their Phytochemical and Antioxidant Screening

Akram Choudhary[1], Mohd Shafeeque[1], Nisha Vats[1], Uzma Bano[2], Jamal Akhtar[3], Pawan Kumar[3], Showkat R. Mir[4], and M. Shahar Yar[1*]

[1]Department of Pharmaceutical Chemistry, School of Pharmaceutical Education and Research (SPER), Jamia Hamdard, India

[2]School of Unani Medical Education and Research (SUMER), Jamia Hamdard, India

[3]Research Officer, Central Council for Research in Unani Medicine, Ministry of AYUSH, Government of India

[4]Department of Pharmacognosy and Phytochemistry, School of Pharmaceutical Education and Research (SPER), Jamia Hamdard, India

Corresponding author: yarmsy@rediffmail.com

Abstract

Globally, carcinoma is considered as a one of the major causes of mortality, with conventional treatments often leading to severe side effects. As an alternative, plant-based therapies offer promising anticancer potential with fewer adverse effects. This study aimed to evaluate the phytochemical profile, antioxidant capacity, and cytotoxic effects of two Unani medicinal plants, *Cuscuta reflexa* (whole plant) and *Syzygium cumini* (seed), against human liver cancer (HepG2) cell lines. Methanolic extracts and their fractions were analyzed for total phenolic content (TPC), total flavonoid content (TFC), and phytochemical analysis. The cytotoxic potential was assessed using the MTT assay, while antioxidant activity was evaluated using the 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay across concentrations ranging from 10 to 100 µg/ml. Phytochemical screening confirmed the presence of flavonoids, tannins, saponins, alkaloids, glycosides, terpenoids, and steroids. Significant differences were observed in TPC and TFC among the individual extracts, fractions and their extracts mixture. Both herbs showed notable dose-dependent cytotoxic and antioxidant activity, with *C. reflexa* and the extract mixture displaying the highest antiproliferative effects on HepG2 cells. Additionally, *C. reflexa* exhibited the strongest antioxidant potential, comparable to ascorbic acid at 10 µg/ml. These findings suggest that *Cuscuta reflexa*, alone or in combination with *Syzygium cumini*, holds significant promise as a natural therapeutic agent for liver cancer management.

Keywords: HepG2, DPPH Assay, MTT Assay, Phenolic acids, Flavonoids.

To fill in the gaps in Alzheimer's disease medications that penetrate the blood-brain barrier by putting forward a translational prediction framework and an integrated ADMET

Ankita Thakur[1*]

Metro College of Health Science & Research, Noida, Uttar Pradesh

Corresponding author: ankitaktu11@gmail.com

Abstract

Despite significant investment in drug discovery, Alzheimer's disease (AD) continues to be a significant unmet medical need. The effectiveness of CNS drugs is severely hampered by the blood-brain barrier (BBB), and many potential compounds fall short because of poor ADMET characteristics or insufficient brain exposure. Key research gaps on BBB-crossing compounds for AD are identified in this review. A strong dependence on in vitro or in silico predictors that do not generalize well in vivo; A limited integration of robust BBB permeability prediction with ADMET profiling; A translational gap between computational predictions and experimental/clinical validation. We point out antipsychotic repurposing candidates (like benperidol) as examples that lack thorough BBB/ADMET and free-energy or dynamics studies but have encouraging docking or preclinical signals. In order to identify candidates with genuine translational potential, we suggest a useful, integrated workflow that combines multi-task machine-learning BBB models, orthogonal in-vitro assays, ADMET pipelines, and conventional MD/MM-PBSA benchmarking.

Keywords: Alzheimer's disease; BBB; ADMET; drug repurposing; Benperidol

Development and assessment of nano constructs for targeting the colon

Ankita Tiwari *

School of Pharmacy, Sharda University, Greater Noida, 201306, Uttar Pradesh, India

Corresponding author: Ankita.tiwari@sharda.ac.in

Abstract

Oxaliplatin (OHP) resistance is a major hurdle in the chemotherapeutic treatment of colorectal cancer (CRC). The concomitant administration of OHP and curcumin act synergistically in OHP resistant cell lines, leading to the reversion of their resistant phenotype. The present study was aimed to formulate Eudragit S-100 (ES-100) coated alginate beads bearing drugs loaded targeted liposomes for simultaneous delivery of OHP and curcumin (CUR) to exert a synergistic therapeutic effect on OHP resistant HT 29 cell line. The liposomes were fabricated by the film dispersion method and optimized using a Box-Behnken design (BBD) with the aid of Design-Expert® software. Hyaluronic acid (HA) was conjugated on the liposomal surface using carbodiimide chemistry to target CD44 receptors overexpressed on the CRC cells. The conjugated liposomes (i.e. OC-L-HA) depicted uniform vesicular size (132.4 ± 21 3.4 nm) and low polydispersity index (0.165 ± 0.070) and high entrapment of OHP and CUR. HA coupled drugs bearing liposomes (OC-L-HA) are exhibiting higher cellular uptake than unconjugated liposomes (UC-L), as evidenced by confocal laser microscopy. OC-L-HA were entrapped in the alginate beads and characterized for various *in vitro* parameters such as bead size, in vitro drug release, and % swelling. MTT assay demonstrated that OC-L-HA exhibited 2.76- and 2.58-fold higher cytotoxicity than targeted CUR liposomes and targeted OHP liposomes, respectively. The colon targeting ability of these liposomes entrapped Eudragit S 100 coated beads on oral administration were assessed by X-ray radiography. *The in vivo* X-ray images affirmed a good targeting ability of the targeted beads to the colon. The outcomes of the studies revealed that these surface-modified liposomes entrapped in Eudragit S-100 coated beads could be an effective strategy for the treatment of CRC.

Keywords: oxaliplatin, alginate beads, colon cancer, Eudragit S 100, curcumin.

IM-HST/2025/049

Pharmacognostic evaluation and *in-vitro* antidiabetic activity of *Hippaestrum vittatum* leaf extract

Chitra Gupta[1*], Rajesh Kumar Sharma[2]

Research Scholar, Teerthanker Mahaveer College of Pharmacy, TMU, Moradabad, (UP) Pin-244001.

Associate Professor, Department of Pharmacognosy, Teerthanker Mahaveer College of Pharmacy, TMU, Moradabad, (UP) Pin-244001.

Corresponding author: chitragupta0212@gmail.com

Abstract

Background: Diabetes mellitus is one of the most prevalent and challenging chronic illnesses today, significantly reducing life expectancy and potentially leading to costly, debilitating, and sometimes fatal outcomes. This study aims to assess the pharmacognostic properties and in vitro antidiabetic activity of *Hippaestrum vittatum* leaf extract.

Materials and methods: Plant extracts are extracted using conventional methods. Phytochemical screening has been done for finding bioactive substances, including flavonoids, alkaloids, and phenolics. The antidiabetic activity was evaluated using α-Amylase Activity.

Results: The phytochemical investigation proved the existence of considerable biologically active compounds. The IC50 value for the alpha amylase inhibitory activity of ethanolic of Hippaestrum vittatum is 384.745 µg/mL, compared to Acarbose, which has an IC50 of 65.454 µg/mL.

Conclusion: The ethanolic extract of *Hippeastrum vittatum* exhibits significant phytochemicals with remarkable antidiabetic effects. This plant has potential for pharmaceutical and nutraceutical uses, requiring further exploration of its therapeutic properties.

Keywords: Diabetes mellitus, *Hippaestrum vittatum,* Phytochemical, α-Amylase.

Antimicrobial Resistance (AMR) & Stewardship

Damini Kharb

Department of Pharmacy Practice, School of Pharmaceutical Sciences, Shri Guru Ram Rai University, Dehradun-248001, Uttarakhand.

Corresponding author: Kharbdamini@gmail.com

Abstract

Antimicrobial resistance (AMR) poses a growing threat to global health by undermining the effectiveness of antibiotics and escalating both public health risks and economic burdens. Recent data highlights a 30% rise in AMR-related mortalities and projects potential costs of up to $100 trillion by 2050, underlining the urgency for immediate action. Effective containment of AMR calls for a multidisciplinary approach that optimizes antibiotic prescriptions, strictly implements clinical guidelines, and promotes continuous education and public awareness. Collaborative stewardship initiatives across healthcare systems and communities are critical for mitigating resistance trends, enhancing patient outcomes, and reducing healthcare expenses. Advanced diagnostic technologies and robust policy frameworks further support these efforts by enabling rapid identification of resistant pathogens and ensuring responsible antimicrobial use. Ultimately, empowering healthcare providers, policymakers, and the public with knowledge and resources will be key to combating this escalating crisis and safeguarding the efficacy of antibiotics for future generations.

Keywords: Antimicrobial Resistance, Stewardship, Public Health

IM-HST/2025/051

Naegleria fowleri Infection: Advances in Diagnosis, Treatment, and Clinical Perspectives

Md. Hamza, Satyender Kumar

Department of Pharm.D, School of Pharmacy, Sharda University, plot no 32, 34, Knowledge Park III, Greater Noida, Uttar Pradesh 201310

Corresponding author: 2024315966.md@ug.sharda.ac.in

Abstract

Naegleria fowleri, commonly known as the "brain-eating amoeba," is a free-living protozoan that causes primary amoebic meningoencephalitis (PAM), a rare but almost universally fatal central nervous system infection. Early diagnosis remains a major challenge due to its rapid progression and non-specific clinical presentation, often mimicking bacterial or viral meningitis. Recent advances in molecular diagnostics, including PCR-based assays and antigen detection methods, have improved the potential for timely identification. Treatment strategies primarily rely on a combination of amphotericin B, miltefosine, azoles, and rifampicin, though survival rates remain limited. Adjunctive therapies, including hypothermia and intensive supportive care, show promise in improving outcomes. Clinically, PAM underscores the need for heightened physician awareness, rapid laboratory confirmation, and aggressive therapeutic intervention. This presentation highlights the evolving landscape of diagnostic approaches, therapeutic regimens, and the critical role of clinical vigilance in mitigating the devastating impact of Naegleria infections.

Keywords: Naegleria fowleri, Primary Amoebic Meningoencephalitis, Diagnosis, Treatment, Clinical Management, Miltefosine.

IM-HST/2025/052

Navigating the New Frontier - A Policy Roadmap for AI-SaMD Regulation in India

Krishnajit Malakar*, **Vikesh Kumar Shukla**

Centre of Drug Regulatory Affairs, Amity Institute of Pharmacy, Amity University Noida

Corresponding author: krishnajitmalakar@gmail.com

Abstract

Background: Artificial intelligence embedded in software as a medical device (AI-SaMD) promises improved diagnostics, personalization, and operational efficiency, but its adaptivity and data-dependence pose novel regulatory challenges. India's regulatory framework remains anchored in pre-AI device rules, creating uncertainty for innovators and risks for patients.

Methods: We conducted a qualitative comparative policy analysis of primary regulatory texts and guidance from leading jurisdictions and recent literature (2015 - 2025). Sources included official agency documents and peer-reviewed syntheses; documents were identified using targeted searches of regulator websites and academic databases.

Findings: International practice is converging on total-product-lifecycle oversight, with leading mechanisms such as the FDA Predetermined Change Control Plan (PCCP) and Japan's PACMP enabling controlled adaptivity while emphasizing real-world performance monitoring. The EU's AI Act represents a precautionary, high-risk approach. India currently lacks explicit pathways for adaptive AI, standardized data quality requirements, and robust post-market surveillance.

Recommendations: We propose a three-phase, SMART roadmap for CDSCO: Phase 1 (0–12 months) - publish AI-SaMD guidance, train reviewers, and pilot a regulatory sandbox; Phase 2 (12–24 months) - implement a CMP (PCCP-like) pathway and mandate AI-specific QMS; Phase 3 (24–60 months) - national AI-SaMD registry and mutual recognition arrangements. Each phase includes measurable KPIs and references to international precedents.

Conclusion: India can balance safety and innovation by adopting lifecycle oversight, targeted capacity building, and incremental pilots that learn from global experience while tailoring solutions to Indian public-health priorities.

Keywords: AI-SaMD, Regulatory Framework, Total-Product-Lifecycle, Predetermined Change Control Plan (PCCP), Post-Market Surveillance, Adaptive Algorithms, Regulatory Sandbox.

IM-HST/2025/053

Oxidative Stress and Antioxidant Pharmacology in Type 2 Diabetes

Nikita Singh Banafar*

Department of Pharmacology, Kamla Institute of Pharmaceutical Sciences, Shri Shankaracharya Professional University, Bhilai, Chhattisgarh, India

Corresponding author: nikitabanafar40@gmail.com

Abstract

Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder characterized by persistent hyperglycemia and progressive β-cell dysfunction. Beyond glucose dysregulation, oxidative stress plays a pivotal role in the onset and progression of diabetic complications. Excessive reactive oxygen species (ROS) generation due to mitochondrial overload, advanced glycation end-products, and polyol pathway activation impairs insulin secretion, worsens insulin resistance, and induces vascular damage. Antioxidant defense mechanisms such as superoxide dismutase, catalase, and glutathione are often reduced in T2DM patients, resulting in elevated oxidative biomarkers like malondialdehyde. Antioxidant pharmacology has therefore emerged as a promising adjunctive therapeutic approach. Experimental and clinical studies demonstrate that compounds such as alpha-lipoic acid, N-acetylcysteine, curcumin, and resveratrol can improve insulin sensitivity, protect β-cells, and reduce vascular complications. However, while preclinical studies consistently show benefits, clinical outcomes remain variable, largely due to heterogeneity in dosage, bioavailability, and patient characteristics. Future research should focus on large-scale, biomarker-guided clinical trials and optimized formulations to establish the clinical efficacy of antioxidant therapy in diabetes management.

Keywords: Type 2 Diabetes Mellitus, Oxidative Stress, Antioxidant Pharmacology, Beta-cell Dysfunction, Alpha-lipoic Acid, Curcumin

Synthesis, Characterisation, and Ethylene Oligomerisation and Polymerisation by 2-Quinoxalinyl-6-iminopyridine Chromium Chlorides

Rahul Bharti*

Rajeshwari Anil Kumar Mahavidlaya Pharmacy, Shahpur Ganga Mallawan Hardoi

Corresponding author: rahulsrivastava462@gmail.com

Abstract

In the past two decades, increasing interest has been focused on the exploration and development of homogeneous transition metal catalysts for olefin oligomerisation or polymerisation. Among transition metal complexes, chromium is the key element in the silica-supported Phillips and Union Carbide catalytic systems commercially used for the polymerisation of olefins. Some recent successes of homogeneous chromium-based catalysis by selective trimerisation or tetramerisation of ethylene have been documented. The importance of these catalysts has provided a compelling rationale for the development of homogeneous chromium catalysts ligated by a variety of ligands, including cyclopentadienyl (Cp)-based and other ligands. By now, Cp-free complexes have begun to figure prominently among chromium-based catalysts since carefully tuning the ligand environment can tremendously affect the catalytic activities and properties of products.

Recently, chromium catalysts coordinated by monoanionic and neutral ligands have been developed for homogeneous ethylene polymerisation. β-Diketiminato and salicylaldimine are examples of reported monoanionic ligands. However, tri- dentate nitrogen compounds as neutral ligands have also been published, and chromium complexes coordinated to N^N^N ligands, such as triazacyclohexane, bis(imino)pyridines (**A**) (Scheme 1), (2-pyridylmethyl) amines, bis(oxazolinyl) pyridine, and bis(benzimidazolyl)pyridines (**B**)[14] have attracted great attention owing to their potential cat- alytic activities for ethylene oligomerization and polymer- ization. Recently, several kinds of chromium complexes containing 2-(ethylcarboxylato)-6-iminopyridines, 2-imino 1,10-phenanthrolines, and 2-(1-isopropyl-2-benzimidazolyl)- 6-(1-(arylimino)ethyl)pyridines (**C**) were investigated for ethylene reactivity with moderate to high catalytic activities.The recently reported work on designing and synthesizing 2-quinoxalinyl-6-iminopyridine derivatives and their iron(II), cobalt(II), and nickel(II) complexes provides an alternative model for [R]catalysts with high activities. With a view to probing the role of the metal centre in systems bound by the same ligand

Results and Discussion

Synthesis and Characterization of the Chromium Complexes ***C1–C5:*** The ligands were efficiently synthesized according to our reported procedure. The six-coordinated (2-quinoxalinyl-6-

iminopyridine) chromium (III) trichlorides **C1**–**C5** were prepared in high yields through the treatment of 2-quinoxalinyl-6-iminopyridine derivatives with 1 equiv. of $CrCl_3(THF)_3$ in CH_2Cl_2 at room temperature (Scheme 2). The resultant products were isolated as green air-stable powders in good yields and characterized by IR spectra and elemental analysis. These complexes were soluble in dichloromethane, THF, and DMF at room temperature. Compared with the IR spectra of the free ligands, the C N stretching vibrations in complexes **C1**–**C5** were shifted to lower frequencies in the range of 1592–1584 cm^{-1}, indicating an effective coordination interaction between the imino nitrogen atom and the chromium centre. The molecular structure of complex **C3** was confirmed by a single-crystal X-ray diffraction study. Crystals of complex **C3** suitable for X-ray structural determination were grown through the slow diffusion of methanol into a dichloromethane solution of the complex. Analysis of X-ray crystallography data revealed that complex **C3** displays a distorted octahedron geometry, in which the chromium centre is coordinated to the tridentate ligand and three chlorides. There is one water molecule incorporated in the crystal lattice of **C3**. Owing to disordered water molecules in the crystal, it was difficult to fix their hydrogen atoms from different Fourier syntheses. Therefore, the hydrogen atoms are not given in the crystal data.

Keywords: Oligomerization, polymerization.

Preformulation Analysis, Formulation, and Development of Anticancer Drugs Using Hot-Melted Solid Dispersion of BCS Class IV Drugs for Solubility Enhancement

Sunil Vitthalrao Kolhe*, Sandhya Laxmikant Borse

Department of Pharmaceutical Science, School of Pharmacy, Sandip University, Nashik (M.H.), India

Corresponding author: sunilvkolhe007@gmail.com

Abstract

The present study focused on developing and evaluating an Olaparib tablet formulation using the Hot Melt Extrusion (HME) process to address poor solubility and bioavailability. Solid dispersion technology was employed to enhance dissolution, improve therapeutic effectiveness, and reduce pill burden. Pre-formulation studies, differential scanning calorimetry (DSC), and X-ray powder diffractometry (XRPD) were performed to characterize the drug–polymer system. Among the formulations studied, run 8 was identified as optimal. It contained 100 mg Olaparib with 20% PVP K30, 30% Mannitol, 1% Silica, and 1% Sodium Stearyl Fumarate (SSF). Run 8 exhibited excellent content uniformity (96.2% ± 0.5) and rapid dissolution, with 87% drug release within 30 minutes, meeting immediate-release expectations. Mechanical properties were also favorable, with a hardness of 6.9 kg/cm², friability of 0.45%, and a disintegration time of 3.4 minutes. In conclusion, run 8 demonstrated robust performance across all critical quality attributes, confirming its efficiency and reproducibility. The study highlights the potential of HME-based amorphous solid dispersions as a promising approach for improving the solubility and bioavailability of poorly soluble drugs such as Olaparib.

Keywords: Olaparib, Hot Melt Extrusion, Solid Dispersion, Bioavailability, Immediate-release.

IM-HST/2025/056

Marin- Derived Fucoidan: Emerging therapy for allergic airway diseases

Ishmiriti Singh*, Swamita Arora, Sanjar Alam

R.V. Northland Institute, Dadri, Gautam Budh Nagar, UP, INDIA

Corresponding Author: singhishmiriti@gmail.com

Abstract

Background: Allergic airway diseases, including asthma and allergic rhinitis, are characterized by chronic inflammation, airway hyperresponsiveness, and immune dysregulation. The medicinal potential of natural chemicals originating from marine sources. Brown seaweeds contain a sulfated polysaccharide called fucoidan, which has been shown to have immunomodulatory, antioxidant, and anti-inflammatory effects. According to preclinical research, fucoidan prevents mast cell degranulation and reduces IgE-mediated reactions.

Objective: The study focuses on experimental evidence from animal models with various routes to examine the preventive and therapeutic role of fucoidan in allergic airway disorders.

Methods: Databases such as PubMed, Scopus, and Google Scholar were used to perform an evaluation of all preclinical and clinical trials.

Research assessing the anti-inflammatory, antioxidant, and immunomodulatory qualities of marine-derived fucoidan in in vitro, in vivo, or clinical settings, as well as its effects on allergic airway illnesses like asthma and allergic rhinitis

Result: By suppressing eosinophil infiltration, IgE levels, and pro-inflammatory cytokines, including IL-4, IL-5, and IL-13, fucoidan decreased airway inflammation, according to an analysis of preclinical research.

Conclusion: Because of its anti-inflammatory, antioxidant, and immunomodulatory properties, marine-derived fucoidan shows encouraging therapeutic potential in allergic airway disorders. Fucoidan might be a safe and useful medication by reducing IgE-mediated reactions, controlling cytokine synthesis, and inhibiting mast cell activation.

Keywords: asthma, allergic rhinitis, chronic inflammation, airway hyperresponsiveness, immune dysregulation.

Preliminary Phytochemical Study and Antimicrobial Evaluation of Ethanolic Extract of *Argyreia nervosa* for the Development of a Nanomiemgel Formulation in Wound Management

Devanand Dongre*, Shikha Jaiswal

Department of Pharmacy, Oriental University, Indore (M.P.), India

Corresponding author: devanandhd@gmail.com

Abstract

The present study evaluated the phytochemical profile and antimicrobial activity of ethanolic leaf extract of *Argyreia nervosa* for its potential use in wound management. The extract was obtained through Soxhlet extraction with 99.9% ethanol (yield 4.72% w/w). Preliminary phytochemical screening revealed the presence of alkaloids, flavonoids, tannins, saponins, and glycosides, which are well recognized for anti-inflammatory, antioxidant, antimicrobial, and wound healing properties. Antimicrobial activity was assessed by the agar well diffusion method against Staphylococcus aureus. At 10 µg/mL, the extract showed moderate inhibition (8 mm zone), whereas at 20 µg/mL, a significant inhibition zone of 15 mm was observed, comparable to the standard drug Mupirocin. Ethanol, used as a control, exhibited only minor inhibition (5 mm). These findings indicate a clear concentration-dependent antimicrobial effect of *Argyreia nervosa*. The study highlights the potential of the extract as an active ingredient for nanomiemgel-based wound care formulations that combine antimicrobial action with tissue healing support. Further research is needed to optimize formulation and evaluate in-vivo wound healing efficacy.

Keywords: *Argyreia nervosa*, ethanolic extract, nanomiemgel, wound healing, antimicrobial activity.

IM-HST/2025/058

The Research on Excipient-Based Solutions for Improving Compression Tableting Outcomes

Harshit Sanadhya*

Shri Venkateshwara University

Corresponding author: harshitsanadhya222@gmail.com

Abstract

The primary objective of this review article is to provide a comprehensive overview of recent advancements in excipient technology and the methodologies involved in their development. Pharmaceutical scientists have increasingly recognized that active pharmaceutical ingredients (APIs) cannot always be effectively formulated or manufactured using single-component excipients. As a result, significant efforts have been directed toward designing multifunctional excipients with enhanced performance to meet formulation scientists' requirements for reduced production costs, improved functionality, and superior tablet quality. One promising approach involves combining two or more existing excipients and modifying their properties to achieve synergistic effects. The evolution of direct compression techniques and high-speed manufacturing equipment has further emphasized the critical importance of excipient flowability and compressibility. Direct compression is now widely regarded as the preferred method for tablet production. In response, the excipient industry has focused on developing novel excipients tailored to the demands of modern high-speed tableting processes. Among these innovations, co-processed excipients have emerged as a new class of functional materials, made possible through the application of particle engineering and materials science—an advancement influenced by practices in the food industry. Coprocessing has been extensively explored as an efficient and cost-effective strategy for producing directly compressible adjuvants, allowing for in-house customization based on specific functional requirements.

Keywords: Excipient technology, Co-processing, Co-processed excipients, direct compression, particle engineering.

IM-HST/2025/059

Evaluation of in-vitro Antidiabetic Effects of *Pyracantha crenulata* (D. Don) M. Roem. Fruit extracts

Himani Dumka[1*], Veerma Ram[1], and Pranshu Tangri[2]

[1]School of Pharmaceutical Sciences and Technology, Sardar Bhagwan Singh University, Balawala, Dehradun-248001, Uttarakhand, India

[2]Department of Pharmacy, GRD (PG) Institute of Management and Technology, Dehradun, 248009, Uttarakhand, India

Corresponding author: himanidumka31051998@gmail.com

Abstract

Aim: *Pyracantha crenulata* (D. Don) M. Roem., is a species of flowering, universally recognized as Nepalese or Himalayan firethorn, Belonging to the Rosaceae family. Various species of genus Pyracantha has been reported to reveal antidiabetic activity. Therefore, this research provides valuable insights into antidiabetic potential of different extracts of *Pyracantha crenulata* (D. Don) M. Roem fruits with in vitro models via alpha (α)-amylase and alpha (α)-glucosidase enzyme inhibition assay.

Methodology: The different unprocessed extracts (n-hexane, ethyl acetate, ethanol and aqueous) were exposed to in vitro antidiabetic potential.

Results and Discussion: The result concluded that the different extracts inhibit alpha (α)-glucosidase and alpha (α)-amylase enzymes in a dose-dependent way. Out of all the extracts, the ethanolic extract exhibited potent anti diabetic activity of 44.79µg/ml at 100µg/ml in α-amylase inhibitory assay, and 30.09µg/ml at 100µg/ml in α-glucosidase inhibitory assay, which are comparable to that of standard acarbose. The present finding has demonstrated that ethanolic fruit extract ameliorates hyperglycemia due to the occurrence of bioactive substances and providing a rationale for the traditional use as a natural hypoglycemic.

Key words: Antidiabetic Activity, Acarbose, Pyracantha crenulata, Phytocompounds, Soxhlation.

IM-HST/2025/060

In-Silico Evaluation of AMPK Modulation by Metformin and Berberine: A Dual-Ligand Approach to Diabetes Therapy

Ritesh Pandit*, Sachin Sharma

Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Parul Institute of Pharmacy and Research, Parul University, P.O. Limda, Tal-Waghodia Vadodara, Gujarat, India. 391760

Corresponding author: rhp9015@gmail.com

Abstract

Insulin resistance and inadequate glucose management are the main causes of diabetes mellitus, which remains a serious global health concern. AMP-activated protein kinase (AMPK), a crucial enzyme that aids in preserving the energy balance in cells, is one intriguing target in the fight against diabetes. Using cutting-edge computational methods, we investigated the interactions between AMPK and three well-known drugs: metformin, phenformin, and the naturally occurring alkaloid berberine. All three substances attach to AMPK efficiently, according to molecular docking, however berberine has the highest binding affinity (–9.4 kcal/mol), surpassing both metformin (–4.5 kcal/mol) and phenformin (–7.7 kcal/mol). Additional molecular dynamics simulations demonstrated that these connections are robust and long-lasting, indicating that these substances may efficiently activate AMPK. Crucially, all three met Lipinski's drug-likeness standards, suggesting that they are probably safe, permeable, and well-absorbed. Berberine is positioned as a particularly promising natural AMPK activator by these findings. It may open the door to more potent, multi-targeted diabetic therapy approaches when paired with synthetic medications like metformin and phenformin. Overall, this work lays a solid foundation for future lab-based validation and opens up exciting possibilities for designing smarter, more holistic anti-diabetic therapies.

Keywords: Diabetes mellitus, AMP-activated protein kinase (AMPK), Metformin, Berberine, In-silico study, Molecular docking, Molecular dynamics simulation, Dual-ligand approach, Drug-likeness, Anti-diabetic therapy.

IM-HST/2025/061

Antidiabetic Potential of *Allium stracheyi* Baker in Fructose and STZ-Induced Diabetic Rats

Lata Bisht[1*], Neeraj Sidana[1], Veerma Ram[2]

[1]School of Pharmaceutical Science, Shri Guru Rai University, Dehradun, India

[2]School of Pharmaceutical Science & Technology, Sardar Bhagwan Singh University, Balawala, Dehradun, India

Corresponding author: bishtlata155@gmail.com

Abstract

Present study aimed to evaluate the antidiabetic potential of methanolic leaf extract of *Allium stracheyi* Baker (MLEAS) in diabetic rat model. Acute toxicity study was done according to OECD-423 guidelines. Diabetes in rats were induced by 10% fructose solution for 14 days and single administration of streptozotocin (40mg/kg) in group II-VI followed by 21 days treatment with glibenclamide (10mg/kg) and MLEAS at dose 100, 200 and 400mg/kg respectively, whereas non- group I received distilled water for 14 days. The fasting serum blood glucose level, insulin resistance and oxidative stress were evaluated on day 0 and 21 and compared statistically. The statistical data suggested that MLEAS caused significant increase in the body weight and decrease in blood glucose level. Compared to diabetic rats, HOMA-IR (Homeostasis Model Assessment for Insulin-resistance) and HOMA-β (Homeostasis Model Assessment for β cell function) showed a statistical decrease in insulin resistance and an increase in pancreatic β cell function in the treated diabetic rats. Furthermore, the altered level of oxidant and antioxidants were also restored by the treatment in diabetic animals. These findings suggested that MLEAS has robust antidiabetic activity that can be developed as an alternative medicine for diabetes and its complications.

Keywords: Diabetes, *Allium stracheyi*, Fructose, Insulin resistance.

Nanohydrogel: A Novel Drug Delivery System

Sakshi Adhana*, Sanjar Alam, Yatendra Kumar

R. V. Northland Institute, Dadri, Gautam Budh Nagar, UP

Corresponding author: sakshiadhana27@gmail.com

Abstract

Nanohydrogels are hydrophilic, three-dimensional, crosslinked polymeric networks at the nanometre scale, capable of absorbing and storing large amounts of water or biological fluids without dissolving. To make a novel and versatile drug delivery system, combine the hydrogels with nanoscale properties. They have high surface area, tunable porosity, and biocompatibility. Nanohydrogels can encapsulate therapeutic agents, including hydrophilic drugs, hydrophobic molecules, nucleic acids, and peptides.

Key advantages of nanohydrogels are their stimuli-responsive behaviour. Their physiological response triggers, such as pH, temperature, ionic strength, redox environment, or specific enzymes. This property allows site-specific, controlled, and sustained release of drugs, improving their therapeutic efficacy and minimizing systemic toxicity. Furthermore, they penetrate through biological barriers, prolong circulation, and enhance accumulation at target tissues and enhance permeability and retention (EPR) effect.

In this, biodegradable polymers are used, such as chitosan, alginate, hyaluronic acid, and synthetic derivatives. They can be prepared through physical or chemical crosslinking methods, including ionic gelation, free-radical polymerization, and click chemistry. Nanohydrogels have high loading capacity, minimal burst release, and protection of labile drugs from degradation, making them especially attractive for the delivery.

In conclusion, nanohydrogels are a promising new way to deliver drugs via different routes of administration. Their unique ability to combine biocompatibility, responsiveness, and controlled release for advanced therapeutics in oncology, endocrinology, and regenerative medicine.

Keywords: Nanohydrogels, hydrophilic, three-dimensional, enhance permeability and retention (EPR).

IM-HST/2025/063

Pharmaceutical Technology-Based Approaches in the Development of Polymer–Lipid Hybrid Nanoparticles to Enhance Phytochemical Delivery

Rekha Mehta[1*], Arun Kumar Singh[2], Abhijeet Ojha[3]

Faculty of Pharmaceutical Sciences, Amrapali University

Corresponding author: *rekmehta.pharma@gmail.com*

Abstract

Phytochemicals possess the remarkable therapeutic potential for the prevention as well as management of various chronic diseases; however, their conventional delivery is often limited because of its poor aqueous solubility, instability in the microenvironment, rapid metabolism by gut enzymes or gut flora, and low bioavailability. Recent advances in pharmaceutical technology have focused on the development of polymer–lipid hybrid nanoparticles (PLHNPs) as a novel platform to overcome these challenges and improve clinical application. PLHNPs integrate the structural advantages of polymeric nanoparticles and lipid-based nanocarriers, offering enhanced encapsulation efficiency, improved stability, and controlled drug release. Their unique architecture, comprising a polymeric core enables for mechanical strength and a lipid shell enables site-specific and targeted delivery of phytochemicals, leads to maximizing therapeutic efficacy while minimizing systemic side effects. The potential of PLHNPs to improve the pharmacokinetic and pharmacodynamic profiles of various phytoconstituents, particularly in cancer therapy, neuroprotection, and cardiovascular disorders has been published and proven by the Research scientist. Furthermore, PLHNPs provide opportunities for sustained drug release, reducing dosing frequency and enhancing patient compliance. Overall, PLHNPs represent a next-generation novel approach for enhancing phytochemical delivery and efficacy, paving the way for their successful application in biomedical & clinical settings.

Keywords: Pharmaceutical technology, polymer–lipid hybrid nanoparticles, phytochemicals, drug delivery, controlled release, site-specific targeting.

IM-HST/2025/064

Comparative Pharmaceutical Quality Analysis of Atenolol Tablets Using UV-Visible Spectrophotometry

Ritika Sarkar*, Satyender Kumar

School of Pharmacy, Sharda University, Plot No. 32 & 34, Knowledge Park III, Greater Noida, Uttar Pradesh – 201310, India

Corresponding author: ritikasarkar131@gmail.com

Abstract

Objective: To investigate the content uniformity and brand-to-brand variation of atenolol tablets available in the market, and to validate the applicability of UV-Visible spectrophotometry as a dependable, economical, and routine method for pharmaceutical quality assessment.

Materials and Methods: Materials and Methods: Commercially available formulations of atenolol were collected from different brands. Standard solutions were prepared, and absorbance was measured at the drug's λmax using a UV-Visible spectrophotometer. Calibration curves were constructed, and the concentrations of the test samples were estimated. Statistical comparison was performed to evaluate content uniformity and compliance with pharmacopeial requirements.

Results: The λmax values obtained for all brands were in line with the reported literature, confirming the presence of atenolol. Minor differences in absorbance and drug content were detected between brands. While most formulations met pharmacopeial standards, a few exhibited slight deviations in drug concentration, which could potentially affect therapeutic performance. The method was found to be reliable, reproducible, and sensitive for routine quality testing.

Conclusion: UV-Visible spectrophotometry proves to be an efficient and practical technique for comparative quality analysis of atenolol formulations. The outcomes underline the importance of regular quality control to ensure therapeutic equivalence across different marketed brands.

Keywords: Atenolol, UV-Visible Spectrophotometry, Pharmaceutical Quality Assessment, Brand Comparison, Quality Control.

Formulation And Evaluation of Herbal Toothpaste Against Tooth-Associated Ailments

Sakthi Priyadarsini S*, Srilakshmi S, Bhujithra M, Srikanth P, Kabilan G

Department of Pharmacognosy, SRM College of Pharmacy, Faculty of Medicine and Health Sciences, SRM Institute of Science & Technology, SRM Nagar, Kattankulathur, 603203, Kanchipuram, Chennai, TN

Corresponding author: sakthips1@srmist.edu.in

Abstract

Oral health is vital for overall well-being, as numerous dental illnesses affect communities worldwide. Traditional and contemporary dentistry have advanced considerably, emphasizing herbal formulations for effective and safe oral care. This study seeks to develop and assess a new herbal toothpaste that includes medicinal herbs recognized for their antibacterial, anti-inflammatory, and antioxidant characteristics. Four different formulations with varying concentrations of herbal extracts were developed to determine the optimal composition. The formulated toothpastes underwent various physicochemical and antimicrobial assessments to ensure its efficacy and stability. Evaluation parameters included colour, odour, taste, smoothness, homogeneity, tube inertness, abrasiveness, pH, viscosity, spreadability, foaming power, and moisture content. Additionally, Fourier-transform infrared (FT-IR) spectroscopy, thin-layer chromatography (TLC), and fluorescence analysis were employed to characterize the formulations. The antimicrobial activity of the formulations was assessed using agar-well diffusion tests against key oral pathogens, including *Fusobacterium nucleatum* and *Streptococcus mutans*, which are primarily associated with periodontitis, gingivitis, and dental caries. The results demonstrated significant antibacterial efficacy, indicating the potential of the herbal toothpaste to combat oral infections effectively. Overall, the findings suggest that the developed herbal toothpaste formulations exhibit promising antimicrobial properties, making them a natural and effective alternative to conventional toothpastes.

Keywords: Herbal formulations, antibacterial, anti-inflammatory, antioxidant, conventional toothpastes

Development and Validation of the Machine Learning Model for Predicting Outcomes in Acute COPD Using DECAF Score

Saraswati Bai Khadam*, Shaik Mohammed Imroz

Department of General Medicine, Apollo Institute of Medical Sciences & Research, Murukambattu, Chittoor – 517127., Andhra Pradesh, India

Corresponding author: saraswatikhadam@gmail.com

Abstract

Background: Acute exacerbations of Chronic Obstructive Pulmonary Disease (AECOPD) contribute significantly to the healthcare burden with unpredictable outcomes. While the DECAF score effectively predicts in-hospital mortality, its application beyond mortality prediction remains limited.

Objective: To develop and validate a machine learning model integrating the DECAF score with additional clinical parameters to predict critical outcomes in AECOPD patients, including mortality, ICU admission, and 30-day readmission.

Methods: This prospective, observational study will recruit 150 AECOPD patients aged ≥40 years meeting GOLD guidelines criteria. Data collection will include DECAF score components, vital signs, laboratory results, and demographic information from electronic health records. Machine learning algorithms (XGBoost, Random Forest, Logistic Regression, SVM) will be employed for predictive modeling. Model performance will be evaluated using accuracy, precision, recall, F1-score, and AUC-ROC metrics with cross-validation techniques.

Expected Outcomes: The integrated machine learning model is anticipated to enhance prediction accuracy beyond traditional scoring systems, enabling early identification of high-risk patients and optimizing clinical decision-making. This research may advance the application of artificial intelligence in respiratory medicine and improve patient outcomes while reducing healthcare costs.

Keywords: COPD, DECAF score, machine learning, predictive modeling, healthcare analytics.

Molecular Docking and Synthesis of Novel Nootropic Agents (Thiazolidinone) as Acetylcholinesterase Inhibitors

Shubhangi Wayal[1]*, Dr. M A Kale[2]

[1]*PhD scholar, Govt. College of Pharmacy, Chhatrapati Sambhajinagar

[2]Associate professor, Government College of Pharmacy, Chhatrapati Sambhajinagar

Corresponding author: wayalshubhangi54@gmail.com

Abstract

It has been evident that during recent decades, Alzheimer's disease (AD), which is considered to be the most prevalent form of dementia, has been observed in much of the global population. For its treatment, acetylcholinesterase (AChE) inhibitors are frequently prescribed to mitigate the cognitive decline of this disease. Looking into the need to develop still better therapeutic agents for its treatment, in the present investigation, we have thought it worthwhile to design some novel analogues of the neuroprotective agent riluzole for better anti-AD activity. The designed derivatives were subjected to molecular docking studies in which they were docked against the AChE enzyme. We have analyzed the molecular interactions of riluzole derivatives viz., 3-[1-(6-triflurомethoxy) benzothiazole-2-yl]-2-aryl thiazolidin-4-ones with AChE. Docking analysis indicated significant binding of these derivatives to the AChE active site. The best molecule among designed derivatives was found to possess binding energy of around -11.1 k cal/mol with standard Riluzole showing binding energy of -6.6 k cal/mol.

The results of the docking studies have further stimulated our interest to explore the synthesis of these new potential compounds, which were obtained by condensation of 6-(triflurомethoxy) benzothiazol-2-amine with various aromatic aldehydes to afford 3-[1-(6-triflurомethoxy) benzothiazole-2-yl]-2-aryl thiazolidin-4-ones. The synthesized compounds have been structurally elucidated by spectroscopic studies.

Keywords: Benzothiazole, AChE, Alzheimer's disease (AD), molecular docking.

IM-HST/2025/068

Development and Validation of an LC–MS Bioanalytical Method for Erlotinib in Human Plasma Using a QbD Approach

Jagirdar Sikandar Zoolquernain Farooq[1*], Khan Furquan Nazimuddin[1]

Department of Quality Assurance, Y. B. Chavan College of Pharmacy, Dr Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra, India.

Corresponding author: szjagirdar@gmail.com

Abstract

In this work, an LC–MS/MS technique based on Quality by Design (QbD) was developed and validated to quantify Erlotinib in human plasma using Erlotinib D6 as an internal standard (IS). There was linearity throughout the drug concentration range of 2.01 ng/mL to 2219.05ng/mL due to the use of a simple and economical liquid-liquid sample preparation technique. The organic solvent ratio (C), buffer pH (B), and mobile phase flow rate (A) were all taken into account as independent variables in a methodical optimization process utilizing the Box-Behnken design. The resulting retention time (R1) and peak response (R2) were evaluated as dependent responses. Optimization studies indicated a notable decrease in variability across method parameters, thereby improving method robustness. The results of validation demonstrated that Erlotinib could be quantified in human plasma with high linearity, accuracy, precision, selectivity, and sensitivity. Evaluations of stability, such as bench-top, auto-sampler, short-, long-, and freeze-thaw experiments, did not reveal any appreciable effects on drug recovery. In conclusion, Erlotinib in plasma can be precisely and consistently quantified using the well-established LC–MS/MS technology, which makes it a good choice for pharmacokinetic and bioequivalence assessments.

Keywords: Bioanalytical Validation, Analytical Quality by Design, Stability, Robustness.

IM-HST/2025/069

Breaking Barriers with Biodegradable Films: A Revolution in UTI Prevention

Swati Sharma*, Rishabh Gupta, Dr. Satyender Kumar

Sharda University, Knowledge Park III, Greater Noida, Uttar Pradesh, 201310, India

Corresponding author: 2022003703.swati@ug.sharda.ac.in

Abstract

Urinary Tract Infections (UTIs) represent one of the most prevalent diseases affecting women globally, frequently resulting in recurrent infections and excessive antibiotic usage. This repeated use of antibiotics not only fuels increasing antimicrobial resistance but also carries risks for side effects and long-term health problems. To meet this urgent challenge, novel biodegradable films have been synthesized based on natural polymers with plant-based antimicrobial compounds. These films are engineered to function as a localized preventative measure, providing efficient bacterial suppression while maintaining high biocompatibility with human tissues. One of the major benefits of these films is their spontaneous natural degradation in 10–14 days, completely eliminating any residue and lowering environmental load compared to synthetic equivalents. These films also ensure prolonged and extended release of bioactive molecules, providing ongoing protection against bacterial colonization and infection. They lower the probability of UTI recurrence and minimize systemic antibiotic dependence by improving local defence mechanisms. Biodegradable antimicrobial films represent a green innovation in women's health by providing a safe, effective, and green preventive solution against UTIs. Such an approach minimizes the use of antibiotics, promotes women's welfare, and is in line with international sustainability initiatives.

Keywords: UTI, Biodegradable films, Antimicrobial Resistance, Natural Polymers, Plant-Based Antimicrobials.

IM-HST/2025/070

AR/VR in Medical Training and Surgical Simulation

Syed Shah N*

Department of Pharmaceutical Analysis, Sanjivani College of Pharmaceutical Sciences, Rajasthan, India.

Corresponding author: syedshah041098@gamil.com

Abstract

Augmented Reality (AR) and Virtual Reality (VR) are rapidly emerging as transformative tools in medical training and surgical simulation. AR integrates digital information into real-world clinical settings, providing medical students and professionals with real-time guidance and enhanced visualization of anatomical structures. VR, on the other hand, creates fully immersive and interactive environments that replicate surgical procedures, allowing repetitive practice without patient risk. Together, AR and VR enable experiential learning, skill refinement, and error correction in a safe and controlled environment. These technologies also foster improved decision-making and confidence among trainees by bridging the gap between theoretical instruction and hands-on practice. In surgical contexts, VR simulations facilitate mastery of complex procedures, while AR applications support intraoperative navigation and precision. By promoting competency-based learning, AR and VR contribute significantly to patient safety, reduce training costs, and advance the overall effectiveness of medical education and clinical practice.

Keywords: Augmented Reality, Virtual Reality, Medical Education, Surgical Simulation, Experiential Learning, Patient Safety.

Novel Drug Delivery System: Insight into self-powered and novel-enabled drug delivery system

Divya Kumari[1], Vibhor Kumar Singh[2]

ITS College of Pharmacy, Ghaziabad, Uttar Pradesh 201206

Corresponding author: vibhors687@gmail.com

Abstract

Advanced technology combined with drug delivery systems makes up novel drug delivery systems. The purpose of these systems is to overcome the drawbacks of traditional medication delivery methods. For example, traditional drug delivery methods are ineffective in treating difficult human conditions like cancer. Therefore, materials that improve penetration to target cells are used to build these systems. They increase the effectiveness and compliance of patients. Microelectromechanical and self-powered drug delivery devices are examples of novel drug delivery systems. Particularly in the creation of medication delivery systems and illness treatment, nanotechnology is a fast expanding and promising subject. Nanocarriers are frequently used in novel medication delivery systems because of their many benefits. The ability to control the size and surface functionalization of nanocarriers to accomplish site-specific targeting is one of its advantages. Their regulated and targeted medication release characteristics have been described by several studies. To increase therapeutic efficacy and reduce undesirable side effects, nanocarriers are driven to their target tissues, where the encapsulated medications are released. As a result, these systems provide the advantages of minimal toxicity, high bioavailability, targeted and regulated drug administration, and enhanced therapeutic effectiveness. Understanding the toxicity and drug release mechanisms of drug delivery systems is essential to developing safe and efficient solutions. This research discusses the use of cutting-edge drug delivery technology. It also concentrates on the loading, targeting, and release of medications from nanocarriers. The primary problems with clinical applications and the potential toxicity of these devices are also covered. This review is expected to be helpful to drug formulation researchers searching for solutions to challenging diseases including cancer and cardiovascular disorders

Keywords: Self-Powered; Nanocarrier’s; Nanotechnology; Targeted release.

IM-HST/2025/072

Development of solid lipid type of Nanoparticles for Intranasal Delivery of Olanzapine: Formulation and *in-vitro* Studies

Vinay Kumar Rao Khadam*, Himmat Singh Chawra

Department of Pharmaceutics, Nims Institute of Pharmacy, Nims University, Jaipur 303121

Corresponding author: kadamindxb@gmail.com

Abstract

This study presents the development and characterization of solid lipid nanoparticles (SLNs) for intranasal delivery of Olanzapine to enhance bioavailability and therapeutic efficacy. Olanzapine was characterized using melting point determination, solubility studies, UV spectrophotometry, DSC, XRD, and FTIR analyses. Nanoparticles were formulated using emulsification-ultrasonication method with optimized solid-lipid ratios. The resulting SLNs demonstrated favorable physicochemical properties with mean particle size of approximately 183 nm, high positive zeta potential (+52.1 mV), and excellent drug entrapment efficiency up to 72.42%. The formulations exhibited nanosized, homogeneously dispersed particles with entrapment efficiencies ranging from 61.43% to 68.33%. In vitro drug release studies revealed sustained release profiles with cumulative drug release between 78.19% and 89.74% over 24 hours, following zero-order and Korsmeyer-Peppas kinetic models. Stability studies confirmed formulation integrity over two months at various temperatures. These findings demonstrate the potential of chitosan-based nanoparticles for effective intranasal delivery of Olanzapine, offering promising prospects for improved central nervous system drug administration.

Keywords: Olanzapine, solid lipid nanoparticles, intranasal delivery, bioavailability, sustained release.

IM-HST/2025/073

Alloherbal Approach Targeting Oxidative Stress and Inflammation in Renal Fibrosis

Yash S Janve*, Jagdish L Kakadiya

Department of Pharmacology, Parul Institute of Pharmaceutical Education and Research, Faculty of Pharmacy, Parul University, Waghodia, Vadodara, Gujarat, 391760, India

Corresponding author: 2323004930002@paruluniversity.ac.in

Abstract

Renal fibrosis, a progressive condition characterized by excessive extracellular matrix (ECM) deposition, is a major contributor to chronic kidney disease and loss of renal function. This study evaluated the effect of Pirfenidone, a clinically used antifibrotic agent, alone and in combination with selected phytoconstituents to develop an alloherbal formulation for experimentally induced renal fibrosis in albino Wistar rats. Phytochemical screening confirmed the presence of bioactive compounds, while antioxidant capacity was assessed using DPPH and nitric oxide assays. Among phytoconstituents, (–)-Epicatechin demonstrated strong antioxidant activity (IC50 = 22.094 µg/ml), surpassing (+)-Pulegone and D-limonene. In nitric oxide assay, Pirfenidone exhibited significant anti-inflammatory activity (IC50 = 49.100 µg/ml). Among combinations, Pirfenidone (Higher) + Epicatechin showed the most potent effect (IC50 = 50.567 µg/ml), closely matching Pirfenidone alone. Intermediate (IC50 = 54.976 µg/ml) and lower dose combinations (IC50 = 71.230 µg/ml) exhibited moderate to reduced efficacy. These findings suggest that combining Pirfenidone with Epicatechin offers complementary antifibrotic, antioxidant, and anti-inflammatory actions, potentially lowering toxicity risks by dose reduction. The results highlight the promise of alloherbal formulations as a comprehensive therapeutic strategy for renal fibrosis management.

Keywords

Renal fibrosis, Pirfenidone, Epicatechin, Alloherbal formulation, DPPH assay & Nitric oxide assay.

IM-HST/2025/074

Formulation and Evaluation of Nanoemulgel in the Management of Fungal Infection

Nakul P Kathar*

Maulana Azad Educational Trust's Y.B. Chavan College of Pharmacy

Corresponding author: nakulkathar29@gmail.com

Abstract

Nanoemulgel is a cutting-edge topical drug delivery system that merges the advantages of nano-emulsions and gels to enhance the therapeutic efficacy and permeability of antifungal agents for the treatment of skin infections. Nanoemulgels are formulated by integrating antifungal drugs into optimized nanoemulsions using oils, surfactants, and co-surfactants selected through solubility studies, followed by incorporation into a gel matrix using agents such as Carbopol. The resulting nanoemulgel enables rapid and sustained localized drug delivery, better patient compliance, and improved drug stability, as shown by characterization of particle size (<200 nm), zeta potential, entrapment efficiency, and physicochemical properties. Evaluation through in vitro, ex vivo, and in vivo studies demonstrates superior antifungal activity and enhanced drug release kinetics compared to conventional creams. Limitations include challenges in encapsulating bulky molecules and concerns regarding surfactant and gelling agent safety. Nanoemulgels thus offer a promising alternative for the effective management of fungal infections, providing controlled drug release, high therapeutic effect, and reduced systemic toxicity.

Keywords: Nanoemugel, Nanoemulsion, PdI.

Development and Characterization of Thymoquinone-Loaded Nanostructured Lipid Carriers for the Management of Hypertension

Akash Dewangan[1]*, Dr. Lavakesh Kumar Omray[1], Dr. Naveen Gupta[1], Dr. Dharmendra Singh Rajput[1], Dr. Dusmanta Kumar Pradhan [2]

[1]Patel College of Pharmacy, Madhyanchal Professional University, Bhopal, M.P.

[2]Raigarh College of Pharmacy, Raigarh, C.G.

Corresponding author: akashdewanganpharma@gmail.com

Abstract

This study aimed to design thymoquinone-loaded nanostructured lipid carriers to increase their bioavailability by oral delivery. Thymoquinone is a bioactive with ACE inhibitor properties used in the treatment of hypertension and improves its bioavailability. Bioactive-loaded nanostructured lipid carriers were prepared by the Hot Homogenization Method, Ultrasonication method and Emulsion Evaporation Method. The resultant of prepared nanostructured lipid carriers was optimized based on their Particle size distribution of 132.02 ± 1.11 nm, Polydispersity Index (PDI) of 0.223 ± 0.15, zeta potential of -35.19 ± 1.11 mV, and more than 95 % thymoquinone was entrapped in the NLCs. The SEM studies indicated that the formulation of TUS-NLC5 diameter is less than 50 nm. The in vitro release studies demonstrated 99.87% release in a pH 6.8 gastric buffer, indicating that the drug entrapped in the nanostructured lipid carriers remains entrapped at acidic pH. The in vivo pharmacokinetic study showed that NLCs released thymoquinone in a controlled manner for a prolonged period of time as compared to the drug in suspension form. These results clearly indicate that optimized formulation of TUS-NLC5 shows a potential controlled release formulation and may be a promising drug delivery system for the treatment of hypertension.

Keywords: Hypertension, Thymoquinone, Nanostructured lipid carriers, Ultrasonication method, *in vivo* pharmacokinetic study.

IM-HST/2025/076

Molecular Docking and ADMET-Toxicity Studies of Oxadiazole Derivatives for Antibacterial Drug Discovery

Aditya Nayak* Ravi Pratap Pulla

Department of Pharmaceutical Chemistry, Parul Institute of Pharmacy and Research, Limda, Vadodara, Gujarat 391760, India

Corresponding author: adityanayak3064@gmail.com

Abstract

The rapid escalation of antimicrobial resistance poses a major global health threat, necessitating the development of novel scaffolds with improved therapeutic efficacy. Heterocyclic frameworks such as oxadiazoles have gained attention due to their broad pharmacological potential, and sulfonamide substitutions are known to enhance antibacterial activity. In this study, a series of oxadiazole derivatives were designed and systematically investigated through molecular docking, ADME, and toxicity profiling to identify promising antibacterial candidates.

Molecular docking was performed against bacterial isomerase (Streptococcus pneumoniae, PDB ID: 8C41). Compounds 18 (–9.6 kcal/mol) and 20 (–9.7 kcal/mol) demonstrated stronger binding affinities than the reference drug Delafloxacin (–9.4 kcal/mol). These ligands formed favorable hydrogen bonding and hydrophobic interactions with key amino acid residues, indicating stable and specific binding modes. Drug-likeness evaluation using SwissADME confirmed Lipinski compliance, with only minor gastrointestinal absorption limitations. Toxicity predictions with Protox-II classified both compounds under Class IV, with LD50 values between 500–560 mg/kg, suggesting an acceptable safety profile for further pharmacological exploration.

The integrated computational assessment highlights compounds 18 and 20 as potent antibacterial scaffolds with favorable pharmacokinetic and toxicity profiles. Their superior binding strength and drug-like features position them as strong lead candidates for preclinical research. Overall, these results provide a rational framework for future in vivo validation and medicinal chemistry optimization aimed at combating resistant bacterial pathogens.

Keywords: Oxadiazole, Sulfonamide, Molecular Docking, Antibacterial Agents, ADME, Drug Discovery.

IM-HST/2025/077

Preclinical Role of Cannabinoid CB2 Receptor Modulators in the Management of Neuropathic Pain

Amit Kumar Bhatt*, Dr. K.K. Sharma

Teerthanker Mahaveer College of Pharmacy (TMU) Moradabad-24400 Uttar Pradesh, India

Corresponding author: amitsln0330@gmail.com

Abstract

Mechanical allodynia, thermal hyperalgesia, and sensory impairment are common side effects of paclitaxel, a commonly used chemotherapy drug, which is known as dose-limiting peripheral neuropathy. Neuroinflammation, oxidative stress, and neuronal hyperexcitability are three of the many pathophysiological pathways that produce this neuropathic pain. The purpose of this research was to examine the antioxidant properties and pharmacological effects of dimethyl itaconate (DI) and a selective cannabinoid receptor type-2 (CB_2) agonist in neuropathic pain animals generated by paclitaxel. After adult rats were given paclitaxel to cause neuropathic pain, they were given either a CB_2 agonist, DI, or a mix of the two. To measure how people responded to pain, researchers used behavioral evaluations such as the von Frey filament and hot plate tests. The following biochemical tests were run: malondialdehyde (MDA), reduced glutathione (GSH), superoxide dismutase (SOD), and catalase activity; for oxidative stress, we also measured levels of pro-inflammatory cytokines (TNF-α, IL-1β, IL-6). The structural integrity was evaluated by doing a histopathological investigation of the sciatic nerves and dorsal root ganglia. Mechanical and thermal hypersensitivity were both markedly reduced by the CB_2 agonist, which may have occurred as a result of modulating peripheral nociceptive pathways and suppressing neuroinflammatory signals. When administered intravenously, DI had a similar analgesic effect while simultaneously activating the Nrf2 pathway and downregulating pro-oxidant mediators, resulting in substantial antioxidant activity. There was a significant improvement in both behavioral and biochemical indicators with combined treatment as compared to monotherapy, suggesting additive or synergistic effects. Based on these results, a potential therapeutic approach for controlling chemotherapy-induced neuropathic pain might be a combination of CB_2 receptor agonists and dimethyl itaconate, which work via antioxidant and dual pharmacological processes.

Keywords: Paclitaxel, neuropathic pain, CB_2 receptor agonist, dimethyl itaconate, oxidative stress, neuroinflammation, Nrf2, chemotherapy-induced peripheral neuropathy.

IM-HST/2025/078

Reprocessing Of Textile Waste for Extracting Novel Carriers for Skin Delivery

Ankita Singh*, Dr. Shaweta Sharma

Galgotias University, Greater Noida.

***Corresponding Author:** shawetasharma@galgotiasuniversity.edu.in

Abstract

The excess fabric waste specifically the cotton has become an severe environmental hazard and there are also possibilities of the reuse of the resource. Cotton which comprises a huge proportion of world fabric contains a greater part of cellulose thus crossing 90 percent and this makes it a perfect raw material as far as producing nanocellulose is concerned. Cellulose nanofibrils (CNFs) and cellulose nanocrystals (CNCs) are examples of nanocelluloses; they are renewable and biodegradable, and can be highly mechanical strength, high surface area and easily functionalizable. Besides its recognized application in nanocomposites and packing, nanocellulose produced by means of cotton waste has emerged as a potential biomaterial in the pharmaceutical and biomedical sector. Recent studies have proved that it can be applicable in healing of wounds where nanocellulose-based dressing might be applied to promote tissue regeneration, maintain the wound wet and prevent the infection. It also has tunable surface chemistry that can entrap antimicrobial and anti-inflammatory agent to be implanted in chronic wounds, burns and diabetic ulcer better to offer an enhanced healing process. Further, the nanocellulose hydrogels and nanogels are being evaluated as an active agent in control of targeted drug delivery in skin-related diseases such as psoriasis, eczema and skin cancers. Such applications would require biocompatibility of the polymer and non-toxicity of cellulose that is particularly favorable in the mentioned options of treatment minimizing the risks of synthetic polymers. The purpose of this review is to have a discussion on the extraction of nanocellulose of the used cotton textile, the chemical, mechanical, enzymatic and hybrid treatment, their shortcoming and its effect on the environment. It reveals the biomedical significance of waste-based nanocellulose particularly in wound healing or utilization of dermatological drug delivery devices. The process of re-using cotton waste to generate nanocellulose is not only a means of encouraging a circular economy but also generates novel prospects of curing skin-related illnesses with the help of sustainable nanomedicine.

Keywords: Cellulose Nanofibrils, Cellulose Nanocrystals, Wound Healing, Dermatological Disorder, Nanogels, Biocompatibility.

Pharmacoeconomic Evaluation of Adverse Drug Reactions in Hospitalized Patients at a Tertiary Care Center

Ashok Kumar[1*], Praveen Kumar Ashok [2], Deepak Nanda [3], Abhishek Gupta [4]

[1*]Faculty, School of Pharmaceutical Sciences, Jigyasa University (Formerly Himgiri Zee University), Dehradun, Uttarakhand, India, 248011.

[2]Professor, School of Pharmaceutical Sciences, Jigyasa University (Formerly Himgiri Zee University), Dehradun, Uttarakhand, India, 248011.

[3]Professor and Director, Tula's Institute of Pharmacy, Dehradun, Uttarakhand, India -248011.

[4]Former Professor, Government Doon Medical College and Hospital, Dehradun, Uttarakhand, India-248011

Corresponding author: ashok.kumar@jigyasauniversity.edu.in

Abstract

Adverse Drug Reactions (ADRs) represent a significant issue within hospital environments, leading to heightened morbidity, mortality, and healthcare expenditures. This study evaluated the incidence, clinical profile, risk factors, and economic burden of adverse drug reactions (ADRs) among hospitalized patients in a tertiary care hospital. A prospective observational study was carried out in the medical wards of Government Doon Medical College and Hospital, Dehradun, over a period of 18 months (February 2023–July 2024). The incidence of adverse drug reactions (ADRs) among 3,036 patients was 7.08%. The most frequently implicated drug categories were cardiovascular agents (30%), anti-infectives (28%), and drugs acting on the alimentary tract and metabolism (19%). Furosemide, ceftriaxone, and amlodipine were identified as common individual contributors. Gastrointestinal disturbances accounted for 34.9% of ADRs, followed by metabolic reactions at 14.4% and dermatological reactions at 10.2%. The majority of adverse drug reactions (ADRs) were classified as Type A (90%). Causality assessment indicated that 52% were deemed "possible," 46% "probable," and 2% "definite." Severity analysis indicated that 51% of adverse drug reactions (ADRs) were classified as mild, 48% as moderate, and 1% as severe. Advanced age, polypharmacy, comorbidities, and extended hospitalization were recognized as critical risk factors. The estimated total economic burden of adverse drug reactions (ADRs) was ₹355,312, with an average cost of ₹2,307 per patient, indicating significant resource utilization. This pharmacoeconomic evaluation highlights the necessity of enhancing pharmacovigilance systems within tertiary care hospitals. Integrating clinical pharmacists, implementing computerized prescribing systems, and improving education for healthcare providers and patients are essential strategies to reduce risks and costs associated with adverse drug reactions (ADRs).

Keywords: Pharmacoeconomics, Adverse Drug Reactions, Economic Burden, Tertiary Care, Polypharmacy, Naranjo Scale, Hospitalization, Medication Safety.

IM-HST/2025/080

A Rational in Silico Design for a Molecular Glue-Based Therapy against Alzheimer's Disease

Brijesh Kumar Chaudhary*, Ravi Pratap Pulla, Bhumika Parmar

Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Parul Institute of Pharmacy & Research, Parul University, P.O. Limda, Wagodiya, Vadodara, Gujarat, India, 391760

Corresponding author: brijeshch9044@gmail.com

Abstract

This study investigates the potential repurposing of lenalidomide for Alzheimer's disease, a progressive neurodegenerative disorder characterized by toxic tau protein aggregation. Lenalidomide, a well-established molecular glue degrader, functions by recruiting the celeblon CRL4^CRBN E3 ubiquitin ligase complex to selectively protein for degradation. We propose that this mechanism could be redirected toward eliminating pathological tau. An integrated computational approach was employed. Network pharmacology analysis identified overlapping pathways between Cereblon (CRBN) and AD-associated proteins, highlighting key intersection in neuroinflammation and protein homeostasis. Molecular docking simulation further modelled the ternary complex of CRBN, lenalidomide, and tau, revealing a stable and energetically favourable interaction. Collectively, these findings suggest that lenalidomide holds strong potential to serve as a molecular glue for tau degradation, offering a robust computational foundation, justifying further validation in biological models to advance this promising therapeutic strategy.

Keywords: Lenalidomide, Alzheimer's disease, Cereblon, Acetylcholinesterase, Network pharmacology, AutoDock vina.

IM-HST/2025/081

Repurposing Doxycycline: A Single Drug with Dual Roles in Antibacterial and Anti-Inflammatory Therapy

Chailvi kumari*, Pinkal Patel

Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Parul institute of Pharmacy and Research, Parul University, P.O. Limda, Tal. -Waghodiya, Vadodara, Gujarat, 391760.

Corresponding author: kumarichailvi@gmail.com

Abstract

Drug repurposing, which involves identifying new uses for well-known medications, is becoming a useful strategy to speed up the development of novel therapies. The most well-known feature of doxycycline, a common tetracycline, is its antibacterial properties. It inhibits protein synthesis and stops bacterial growth by attaching itself to the 30S ribosomal subunit of bacteria. It's interesting to note that new research has shown that doxycycline also has strong anti-inflammatory properties, especially by inhibiting matrix metalloproteinases (MMPs), which are enzymes that break down collagen and cause tissue inflammation. Examples of these MMPs are MMP-2 and MMP-9. This dual therapeutic potential was investigated in the current work using molecular docking. With a docking score of −9.0 kcal/mol, doxycycline demonstrated a substantial binding affinity with bacterial ribosomal proteins, confirming its well-established antibacterial function. With a docking score of -8.6 kcal/mol, it also demonstrated noteworthy binding to human metalloproteinases, indicating a potential anti-inflammatory activity. These findings suggest that doxycycline is a possible multi-target medication that can be used to treat inflammatory and infectious illnesses in addition to being an antibiotic. Its dual function emphasizes its clinical significance and makes medication repurposing a successful tactic in contemporary therapeutic development.

Keywords: Doxycycline, Drug repurposing, Dual therapeutic action, Antibacterial activity, Anti-inflammatory activity, Molecular docking, Binding affinity.

Next-Generation Transdermal Therapeutics for Rheumatoid Arthritis: Bridging Limitations of Conventional Therapy

Diksha Mandan*, Dr. Prashant Kumar Dhakad

Gyan Vihar School of Pharmacy, Suresh Gyan Vihar University, Jagatpura, Jaipur, Rajasthan, 302017, India

Corresponding author: mandandiksha@gmail.com

Abstract

Rheumatoid arthritis (RA) is a chronic, progressive autoimmune disorder characterized by persistent synovial inflammation, joint destruction, and systemic complications. Its pathophysiology involves complex interactions between genetic predisposition, environmental triggers such as smoking, and aberrant immune responses, particularly autoantibody production against citrullinated and acetylated proteins, leading to osteoclast activation and bone erosion. Conventional therapeutic approaches, including nonsteroidal anti-inflammatory drugs (NSAIDs), glucocorticoids, and disease-modifying antirheumatic drugs (DMARDs), though effective, are often associated with systemic toxicity, limited patient compliance, and incomplete disease control. Recent advances in transdermal drug delivery systems (TDDS) provide promising alternatives for RA management. Traditional transdermal patches have demonstrated benefits such as bypassing first-pass metabolism, sustained drug release, and improved adherence, yet their use remains restricted to small, lipophilic molecules. To overcome these limitations, novel strategies—including gels (microemulsion, nanoemulsion, nanomicelle, ethosomal, and transfersomal), nanoparticles, nanofibers, and microneedles—have been developed to enhance drug penetration and therapeutic efficacy. This review provides a comprehensive overview of the historical perspectives, burden, pathophysiology, risk factors, and conventional therapies for RA, while emphasizing the emerging role of personalized and advanced transdermal delivery systems. These novel approaches hold potential to improve patient outcomes, minimize adverse effects, and shape the future of RA therapeutics.

Keywords: Rheumatoid arthritis, Autoimmunity, Disease-modifying antirheumatic drugs, Transdermal drug delivery, Nanocarriers, Microneedles.

IM-HST/2025/083

Nanoformulation of an Ayurvedic Therapeutic Agent for the Management of Epilepsy

Foziyah Zakir*

Department of B. Pharm (Ayurveda), School of Pharmaceutical Sciences, Delhi Pharmaceutical Sciences and Research University, New Delhi 110017, India

Corresponding author: foziyahzakir@dpsru.edu.in

Abstract

Background: Shatapushpa oil has been used as a therapeutic agent for a very long time in accordance to Ayurvedic literature. It has a wide range of medicinal properties such as anti-inflammatory, wound healing, skin diseases etc. Studies have suggested that Shatapushpa oil possesses constituents that can be beneficial for the treatment of epilepsy. However, Shatapushpa oil exhibits several limitations that prevent its use in bare form. Therefore, the present work highlights how a novel delivery system can be clubbed with traditional Ayurvedic preparations to enhance patient acceptance as well as therapeutic performance.

Aims: The work involves the development of a nanoemulsion formulation of Shatapushpa oil

Methods: The nanoemulsion was prepared and characterized for various physical attributes. The in-vivo testing of the formulation was carried out on animals to test its potential against epilepsy.

Results: The formulation was successfully prepared with a size of 22 nm, PDI 0.23 and zeta potential -6.27 mV. The nanoemulsion was converted into a gel for ease of application and the necessary attributes were found to be satisfactory. The in-vivo studies demonstrated enhanced anti-epileptic potential when compared to pure Shatapushpa oil.

Conclusions: The results proved that incorporation of traditional medicine into a novel delivery system can enhance its therapeutic potential.

Keywords: Ayurveda, Shatapushpa oil, epilepsy, nanoemulsion.

IM-HST/2025/084

Comparative Analysis of Anthropometric, Clinical and Biochemical Profiles in Lean vs. Obese Type 2 Diabetes Mellitus Patients at a Tertiary Care Centre in Uttarakhand

Himanshu Thapliyal[1]*, Dr. Rana Usmani[2], Dr Amit Verma[3]

[1]PhD Scholar, Medical Biochemistry, S.G.R.R.I.M. & H.S, Dehradun

[2]Professor, Biochemistry, S.G.R.R.I.M. & H. S, Dehradun

[3]Professor & Head, Medicine, GBCM, Dehradun

Corresponding author: thapliyal19himanshu@gmail.com

Abstract

Background: Type 2 diabetes is not a single pattern of disease. While some patients are lean and struggle mainly with poor insulin secretion, others are obese and mainly face insulin resistance with added metabolic complications. We aimed to study how lean and obese T2DM patients differ in their Anthropometric clinical and biochemical profiles.

Materials and Methods: The present study was conducted on 150 T2DM patients (75 lean, BMI <23 kg/m² & 75 obese, BMI ≥25 kg/m² as per South Asian criteria). Anthropometric measurements, fasting blood glucose, HbA1c, lipid profile, fasting insulin, and C-peptide were measured using standard methods. Statistical analysis was done in SPSS, with $p<0.05$ considered significant.

Results: Obese patients were older and had longer diabetes duration. They showed higher BMI, triglycerides, insulin, C-peptide, and HOMA-IR, indicating marked insulin resistance. Lean patients, in contrast, had higher fasting glucose and HbA1c, suggesting poor glycemic control and beta-cell dysfunction. HDL was lower in the obese group.

Conclusion: Lean and obese T2DM represent two different faces of the same disease. Obese patients need strategies targeting insulin resistance, while lean patients may require approaches that preserve and support beta-cell function.

Keywords: diabetes, insulin resistance, Anthropometric measurements, beta-cell dysfunction.

IM-HST/2025/085

Development and Evaluation of Algae-Based Nanoformulation for the Treatment of Cancer

Kirti Mehra, Dr. Shaweta Sharma*

Galgotias University, Greater Noida.

Corresponding Author: shawetasharma@galgotiasuniversity.edu.in

Abstract

The study aims at the development, characterisation, and testing of a new nanoformulation of a green alga (Ulva), to treat breast cancer. Ulva is also reported to be a good source of bioactive polysaccharides, antioxidants, and essential metabolites which have several therapeutic effects. Its extracts were used in the green synthesis of nanoparticles, whereby, the reducing and capping qualities of the biomolecules were intrinsic and guaranteed the stability, safety, and sustainability of the formulation. The advanced methods of analysing nanoparticles were applied to characterise them in terms of particle size, shape, surface morphology, zeta potential, and chemical composition in order to be precise and reproducible. The In-vitro cytotoxicity tests performed on the breast cancer cell lines showed that the proliferation of cancer cells, induction of apoptosis and the control of major apoptotic proteins were significantly inhibited. Moreover, the nanoparticles were also selective and biocompatible as they were found to be less toxic to normal cells. Their therapeutic efficacy was further demonstrated In-vivo in murine tumour models showing significant decrease in tumour volume, positive regulation of oxidative stress biomarkers and positive histopathological alterations of treated tissues. The overall results indicate that Ulva nanoformulations have a tremendous potential as a sustainable and targeted drug delivery system in the treatment of breast cancer. This not only increases the potential of marine-derived nanomedicine by improving drug efficacy and reducing systemic toxicity, but also forms the basis of future studies of algae-inspired therapeutics in cancer therapy.

Keywords: Ulva, Nanoformulation, Breast Cancer, Drug Delivery, Apoptosis.

In Silico Molecular Docking and ADMET Profiling of Gallophilia Glauca Phytochemicals as Potential Histamine H1 Receptor Inhibitors for Allergic Rhinitis Treatment

Love Kumar Sahu*, Sachin Kumar Sharma

Department of Pharmaceutical Chemistry, Parul Institute of Pharmacy & Research, Parul University, Vadodara, Gujarat (391760).

Corresponding author: lsahu6156@gmail.com

Abstract

Allergic rhinitis is a widespread allergic condition marked by sneezing, nasal congestion, and itching, triggered by histamine binding to H1 receptors. *Galphimia glauca*, a traditional medicinal plant, contains bioactive compounds with reported anti-allergic effects. In this study, we used computer-based (in silico) methods to explore whether these plant molecules could block the histamine H1 receptor. The 3D structure of the H1 receptor (PDB ID: 3RZE) was selected for molecular docking, and key *G. glauca* phytochemicals such as gallic acid, methyl gallate, and tetragalloylquinic acid, Gulphamine derivatives were tested for their ability to bind within the receptor's active site. Several compounds displayed strong docking scores and stable hydrogen-bond interactions, suggesting good potential as H1 blockers. To predict their drug-likeness and safety, ADMET (Absorption, Distribution, Metabolism, Excretion, and Toxicity) profiling was performed using SwissADME and pkCSM. The leading molecules showed high gastrointestinal absorption, favourable logP values, no predicted hepatotoxicity, and low risk of mutagenicity or cardiotoxicity, indicating encouraging pharmacokinetic and toxicity profiles. These findings highlight *Galphimia glauca* phytochemicals as promising candidates for the development of safe and effective histamine H1 receptor inhibitors and provide a rational basis for further laboratory and clinical studies.

Keywords: Galphimia glauca, Histamine H1 receptor, Allergic rhinitis, Molecular docking, PDB ID 3RZE, ADMET profiling, Phytochemicals, Drug-likeness, Toxicity prediction.

IM-HST/2025/087

Advancing Health Science through Sustainable Analytical Methodologies: A Green Chemistry Framework

Moein S Attar*

Research Scholar, Channabasweshwar Pharmacy College (Degree), Latur, Affiliated to SRTMU Nanded

Corresponding author: moinattar@gmail.com

Abstract

The growing emphasis on sustainability in pharmaceutical research has catalyzed the integration of green analytical chemistry (GAC) principles into method development workflows. This study presents a validated, eco-conscious analytical methodology designed to support health science applications while minimizing environmental impact. Employing reversed-phase high-performance liquid chromatography (RP-HPLC), the method was optimized using response surface methodology (RSM) under a Quality by Design (QbD) framework. Key parameters, including mobile phase composition, flow rate, and detection wavelength, were systematically refined to achieve high sensitivity, reduced solvent consumption, and shorter run times. Greenness assessment tools such as the Analytical Eco-Scale, Green Analytical Procedure Index (GAPI), and AGREE metrics were applied to evaluate the environmental performance of the developed method. Comparative analysis with conventional protocols demonstrated significant improvements in sustainability without compromising analytical robustness. Validation was conducted in accordance with ICH Q2 (R1) guidelines, confirming the method's linearity, accuracy, precision, and robustness for dual-drug estimation in pharmaceutical formulations. This work underscores the feasibility of integrating GAC principles into routine analytical practices, offering a scalable and regulatory-compliant pathway toward sustainable health science research. The proposed framework not only aligns with institutional and environmental mandates but also sets a precedent for future innovations in green analytical technology.

Keywords: green analytical chemistry (GAC), high-performance liquid chromatography (RP-HPLC), response surface methodology (RSM), Quality by Design (QbD).

Isolation and Characterisation of Parthenin and Anhydroparthenin from *Parthenium hysterophorus* and In-Silico Studies on Anti-Chronic Lymphocytic Leukemia

Prateek A A.*, **Yogesh P Bharitkar, P. M. Ronad, A A Ankalikar**

Department of Pharmaceutical Chemistry, KLE College Of Pharmacy, Vidyanagar, Hubli-580031. (A Constituent Unit of KAHER Belagavi)

Corresponding author: prateekangadi2001@gmail.com

Abstract

Parthenin and Anhydroparthenin are pseudoguaianolide type of sesquiterpene lactones (STLs) derived from tropical weed *Parthenium hysterophorus* belonging to the asteraceae family. Initially the aerial parts of plant were collected and extracted by maceration process using chloroform as solvent after which slurry of the extract was prepared and isolated using column chromatography by using suitable solvents in the order of increasing polarity. TLC of the isolated fractions was done by using 10% methanol & chloroform as mobile phase and ceric ammonium sulphate as visualising agent after which crystallisation of the confirmed compounds was carried out. Structural confirmation of the isolated compounds was done by 1HNMR, 13CNMR and mass spectral analysis. Molecular docking studies of the isolated compounds was performed on chronic lymphocytic leukemia protein (PDB ID: 6X3P) were the isolated compounds showed good interaction with the target protein. Structural validation of the target protein was confirmed by the Ramachandran plot. The ADMET and physicochemical properties were also determined which showed excellent results.

Keywords: Column chromatography, Parthenin, Anhydroparthenin, Chronic Lymphocytic Leukemia.

IM-HST/2025/089

Improved Bioavailability of Curcumin through Phospholipid Complexation for Effective PCOS Therapy

Pooja Mallya[1*], Shaila A Lewis[2]

[1]Department of Pharmaceutics, Faculty of Pharmacy, MS Ramaiah University of Applied Sciences, Bengaluru, Karnataka, India

[2]Department of Pharmaceutics, Manipal College of Pharmaceutical Sciences, MAHE, Manipal, Karnataka, India

Corresponding author: poojamallya.ps.ph@msruas.ac.in

Abstract

Polycystic ovary syndrome (PCOS) is a multifaceted disorder affecting reproductive, endocrine, metabolic, and psychological functions in women, with a global prevalence of 5–26%. Conventional therapies provide only symptomatic relief and pose long-term safety concerns, prompting interest in phytotherapy. Curcumin (CUR) shows therapeutic promise but suffers from poor aqueous solubility (0.6 µg/mL) and oral bioavailability (<1%), limiting clinical efficacy. This study investigated a phospholipid complex of CUR extract (CPLC) in dehydroepiandrosterone (DHEA)-induced PCOS rats. CPLC was prepared by solvent evaporation and evaluated in rats administered DHEA (60 mg/kg) with a high-fat diet for 21 days. Parameters assessed included body weight, estrous cycle, blood glucose, serum testosterone, lipid profiles, ovarian morphology, and histopathology. CPLC markedly enhanced CUR solubility and bioavailability and produced significant improvements in reproductive and biochemical markers compared to free CUR and controls ($P<0.0001$). Treatment restored regular estrous cycles, reduced weight gain, normalized glucose and serum testosterone, and improved lipid profiles ($P<0.0001$). Histological analysis confirmed improved ovarian morphology. These findings demonstrate that CPLC effectively enhances CUR bioavailability and mitigates PCOS symptoms, supporting its potential as a safe, plant-based alternative to conventional PCOS therapies.

Keywords: Curcumin, DHEA, oral bioavailability enhancement, phospholipid complex, polycystic ovary syndrome, solubility enhancement.

Electronic Health Records: A Future Endeavour for Better Health Analysis

Priya Yadav*, Shreeti Ambastha

GNIT College Of Pharmacy

Corresponding Author: py433938@gmail.com

Abstract

Electronic Health Records (EHRs) are a digital version of patient's medical histories, designed to be shared securely across the healthcare system. The objective of EHR includes improving patient care & safety and optimizing medication management with accuracy and prerecession. They provide real-time, patient-centered information that supports accurate diagnosis, effective treatment and improved healthcare outcomes. EHRs integrate data such as demographic, medical history, medication, allergies, and lab result. EHRs play a critical role in modern healthcare delivery. Electronic Health Records (EHRs) are integral to modern pharmacy, providing a digital repository for patient data crucial for medication management, quality care and patient safety. Pharmacists use EHRs for documentation, medication reconciliation and patient evaluation to optimize medication therapy and enhance communication within the healthcare team. In the future, EHRs will evolve beyond basic data storage to become an intelligent, fully integrated healthcare system. Advancements such as barcoding, radio-frequency identification (RFID) and speech recognition will enhance accuracy and efficiency. Advanced features like clinical decision support will help pharmacists provide personalized therapy, optimize drug dosing and support evidence-based prescribing. The use of artificial intelligence and big data analytics within EHRs will support pharmacovigilance, medication therapy management and early detection of drug-related problems.

Keywords: Electronic Health Records (EHRs), real-time, patient-centered, documentation, medication reconciliation.

NLC (Nanostructured Lipid Carrier) Gel for Management of Pain and Inflammation in Arthritis

Firdaus Rana*

PhD Scholar, Sharda School of Pharmacy, Greater Noida, UP

Corresponding author: 2023202203.rana@dr.sharda.ac.in

Abstract

Nanostructured Lipid Carriers, or NLCs, are tiny systems used to deliver medication. They combine solid and liquid lipids, which are fats, and are kept stable by certain substances called surfactants. These carriers have some major advantages: they can hold a lot of medication, release it in a controlled way, stay stable over time, and penetrate the skin more effectively. That's why they work well for topical treatments and other medical applications. Traditionally, we have relied on creams and ointments for topical medications, but those can sometimes fall short. They often struggle with issues like not penetrating the skin well, breaking down quickly, or releasing their drugs unevenly. NLCs offer a better alternative with their improved stability, better skin absorption, and steady drug release. In this particular study, Researchers aimed to create NLCs that carry Rutin, a medicine used for treating inflammation. They used a heat-based method to blend different lipids and surfactants to make these carriers. The final products were then tested to see how well they loaded the drug, their thickness, how easy they were to apply, their acidity (pH), and how the drug released over time. The results showed that the drug was successfully trapped in the formulations, with entrapment rates between 65.81% and 74.63%. The release of the drug happened in a steady, controlled manner, and the NLC gels held up well even in challenging conditions like high heat and humidity. Thanks to their small particle size, these gels could improve skin absorption, leading to more effective treatments with fewer side effects. Overall, this research suggests that using NLC-based gels could be a solid approach for delivering Rutin in treating Arthritic inflammation.

Keywords: Nanostructured lipid carrier (NLC), Rutin, Topical Drug Delivery, High Pressure Homogenization (HPH), Arthritic Score.

IM-HST/2025/092

A Current Approach to Bio 3D Printing Accession in Organ Replacement Therapy

Shubham Kumar*, Md. Zeeshan

GNIT College of Pharmacy

Corresponding author: shubhamkumardubey837@gmail.com

Abstract

Bio 3D-Printing solve the problem of the shortage of organs and reduces the immune rejection on Organ transplantation. This technology (Bio-3D Printing) used due to lack of organ in globally, need for Personalized. The Current Approach to Bio-3D Printing for Organ replace is big change in regenerative medicine by reducing the lack of Organ, removing waiting lists, custom-fitting Organs, Savings lives and improving the quality of life of patients. This technology still in its early stages, but in surgical future accelerate drug development, more precise surgical intervention and lead to a significant increase in patient survival rates. Some challenges for 3D printing are the cost and time intensity, Difficulties in creating Biomaterials, ensuring safety and regulatory approval. Help in future in fast the process of tissues and Organ Formulation, Growth in treatment of various diseases.

Keywords: 3D-Printing, Organ transplantation, Biomaterials, Organ Formulation.

IM-HST/2025/093

Antifungal activity of *Tabernaemontana divaricata*

Sumedha Prakash Bane*, Mayuri Prakash Bane

Vikrant university

Corresponding author: sumedhabane10@gmail.com

Abstract

Tabernaemontana divaricata plant is also known pinwheel and *Tagar*. There are various pharmacological actions like anti-cholinergic, brain tonic, antimicrobial, antidiabetic etc. The current study focuses on antifungal activity using bioactive element derived from *Tabernaemontana divaricata* leaf extract. First of all, leaves and stem are shelter dried and then ethanol was used for extraction. Further phytochemical screening and solubility testing was done. Leave and stem extract was high in phytoconstituents like alkaloids, glycosides, steroids tannin, fixed oils and flavonoids. One of the main indole alkaloids was identified by using thin-layer chromatography (TLC). Antifungal activity of leave and stem extract was done by using well diffusion method, by comparing both extracts leave extract showed more activity against fungal strain. Most of human beings are suffering from fungal infection. So, maybe *Tabernaemontana divaricata* is useful for fungal infection.

Keywords: *Tabernaemontana divaricata***,** alkaloids, thin-layer chromatography (TLC), fungal infection.

IM-HST/2025/094

Anticonvulsant Potential of Flavonoid-Rich Fraction of *Urtica dioica* in the MES Seizure Model

Supriya Negi*[1] Harsita Pant[2], Ankush Sundriyal[1]

[1]School of Pharmaceutical Sciences and Technology, Sardar Bhagwan Singh University, Dehradun, India-248001,

[2]Himachal Institute of Pharmacy, Paonta Sahib, Himachal Pradesh, India- 173025

Corresponding author: supriyanegi43@gmail.com

Abstract

Objective: Urtica dioica is rich in bioactive compounds, including flavonoids and tannins, yet their individual anticonvulsant potentials are unexplored. This study aimed to evaluate the anticonvulsant effect of flavonoid- and tannin-rich fractions from U. dioica roots using the maximal electroshock seizure (MES) model in rats.

Materials & Methods: Roots of U. dioica were collected, authenticated, dried, powdered, and subjected to sequential solvent extraction. Phytochemical screening confirmed flavonoids and tannins, and the ethyl acetate extract was fractionated accordingly. Rats were subjected to MES seizures via corneal electrodes delivering 150 mA for 0.2 s, with phenytoin (25 mg/kg, i.p.) as a positive control. Treatment groups received either the tannin or flavonoid fractions orally at 10 or 40 mg/kg.

Results: The tannin fraction (10 and 40 mg/kg) showed no significant effect in the MES model. In contrast, both doses of the flavonoid fraction produced a statistically significant antiepileptic potential

Conclusion: These results indicate that the flavonoid-rich fraction of U. dioica roots possesses selective anticonvulsant activity in the MES model in rats, while the tannin fraction does not. The flavonoid fraction may serve as a promising candidate for further phytochemical isolation.

Keywords: Urtica dioica, Flavonoid fraction, Maximal electroshock seizure (MES), Anticonvulsant activity, Phytochemicals.

In Silico Exploration of *Curcuma longa* Phytoconstituents as Potential VEGFR-2 Inhibitors as Anticancer: Molecular Docking and ADME Evaluation

Vikas Gupta*, Pinkal Patel

Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Parul Institute of Pharmacy and Research, Parul University, P.O. Limda, Tal, Waghodiya, Vadodara, Gujarat, 391760.

Corresponding author: vikasgupta6396@gmail.com

Abstract

This study aimed to determine the anticancer activity of curcumin and its derivatives (*Curcuma Longa*) using *In-silico* studies, molecular docking and ADME insights. *In-silico* studies were carried out to show anticancer potency. *In-silico* studies were performed by molecular docking via Autodock Vina to identify binding affinity and interaction between different ligands with VEGFR-2 (PDB ID – 4AG8). Four molecules exhibited a well-docked score compared to standards like Axitinib. When molecular docking was analyzed, which were identified as curcumin, cyclocurcumin, demethoxycurcumin and Bisdemethoxycurcumin. ADME properties were examined via SWISS ADME to determine the pharmacokinetic profile of different compounds studied. The *in-silico* screening showed that all ligand forms are stable when complexed with VEGFR-2. The binding affinity is better between the complex with VEGFR-2 compared to the standard (Axitinib). In all of these, compound cyclocurcumin shows the most stable affinity with the target receptor. The *in-silico* studies showed that all ligands fulfilled the Drug-likeness properties, so this means these are less toxic, which shows good absorption and permeability. Curcumin and its derivatives are better candidate as cancer treatment because of their anticancer property.

Keywords: Curcumin, VEGFR-2, Curcuma longa, Molecular docking, ADME.

Design and *in-silico* Evaluation of Oxazolidinone Derivatives as Anti-Microbial Agents

Vineet Kumar Dwivedi, Ravi Pratap Pulla

Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Parul Institute of Pharmacy and Research, Parul University, P.O. Limda, Tal Waghodia, Vadodara, Gujarat, India. 391760

Corresponding author: dwivedivineet17@gmail.com

Abstract

The development of resistant strains of bacteria has led to the need to develop new treatment agents to address the key bacterial elements. A direct comparison between a lead compound and its synthesized analogs based on the bacterial 23S ribosomal RNA of the 50S subunit was conducted in this study using AutoDock Vina. The docking outcomes revealed that the lead compound and its derivatives showed a higher binding affinity with that of the standard drug linezolid which indicated that they could be used as a more effective inhibitor of bacterial protein synthesis. SwissADME analysis was conducted to determine the pharmacokinetic suitability and showed that the lead compound has good drug-likeness, absorption, and bioavailability. Also, toxicity analysis in the ProTox-II platform estimated reasonable safety margin, and unlikely to cause mutagenicity and organ toxicity. All these in silico results demonstrate the potential of the lead compound in treatment as a new antibacterial agent with enhanced binding specificity, favorable pharmacokinetics, and less toxicity. Such computational findings will have to be validated further in experimental studies to be able to proceed with the compound to preclinical stages.

Keywords: Anti-microbial, 23S ribosomal RNA, Linezolid, AutoDock Vina, SwissADME, ProTox-II, Drug-likeness.

In Silico Identification and Evaluation of Bioactive Constituents from *Glycyrrhiza inflata* Against HSV- Glycoprotein D Using Virtual Screening, Molecular Dynamics Simulations, SwissADME, and ProTox-3 Analyses

Vishwakarma Sapana*, Sachin Sharma

Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Parul Institute of Pharmacy and Research, Parul University, P.O. Limda, Tal. Waghodia, Vadodara, Gujarat, India, 391760

Corresponding author: v1sapanavishwakarma@gmail.com

Abstract

Herpes simplex virus (HSV) remains a major global health concern due to increasing drug resistance and limited efficacy of current therapies. Natural products and phytochemicals offer promising alternatives in antiviral drug discovery, owing to their structural diversity and bioactivity. *Glycyrrhiza inflata*, a traditional medicinal herb, contains compounds such as liquiritin and glycyrrhizin with reported antiviral potential. In this study, sixty phytoconstituents obtained through virtual screening were evaluated using a comprehensive computational drug design workflow. Ligands were optimized and docked against HSV glycoprotein D (PDB ID: 2C36) using AutoDock Vina. Docking interactions were analyzed in Discovery Studio to assess binding affinities and key molecular interactions. SwissADME predicted pharmacokinetic properties, while ProTox-3 provided toxicity profiling. Molecular dynamics simulations evaluated the stability of ligand–protein complexes, and Molinspiration estimated bioactivity scores and drug-likeness. All phytoconstituents showed interaction with HSV glycoprotein D, with liquiritin exhibiting the strongest binding affinity (–8.1 kcal/mol) and stable pocket interactions. Glycyrrhizin also demonstrated a favorable score (–7.4 kcal/mol) and consistent dynamic stability. These findings highlight liquiritin and glycyrrhizin as promising HSV inhibitors and underscore the value of integrated *in silico* approaches in accelerating early-stage antiviral drug discovery.

Keywords: *Glycyrrhiza inflata*, HSV, Glycoprotein D, Molecular Docking, Molecular Dynamics, SwissADME, ProTox-3.

In-Silico Evaluation of Novel Benzimidazole-Thiazolidinone Derivatives for Dual Antidiabetic and Antihypertensive Potential

Mohd Shafeeque* **and M. Shahar Yar**

Department of Pharmaceutical Chemistry, School of Pharmaceutical Education and Research (SPER), Jamia Hamdard, India

Corresponding author: mohdshafeeque1999@gmail.com

Abstract

Diabetes and hypertension frequently coexist and accelerate cardiovascular, renal and metabolic complications. Addressing these conditions simultaneously with a single molecule offers a promising therapeutic strategy. In this study, a novel class of heterocyclic derivatives incorporating benzimidazole and 4-thiazolidinone moieties was designed using a structure-based drug design approach targeting Peroxisome Proliferator-Activated Receptor gamma (PPAR-γ) and angiotensin II type-1 (AT1) receptor. Molecular docking was carried out using Schrödinger Glide XP against PPAR-γ (PDB ID: 2PRG) and AT1 receptor (PDB ID: 4YAY), revealing favorable binding profiles for several designed compounds. Notably, compound MSN15 exhibited a docking score of -8.8, forming key interactions with HIE323, TYR327, and TYR473, comparable to standard drugs such as Pioglitazone (-9.71) and Rosiglitazone (-9.82). Both derivatives also show good binding affinity with 4YAY. Subsequent ADMET profiling via QikProp indicated favorable drug-like properties. Compounds such as MSN15 and DCF10 demonstrated high human oral absorption (more than 95%), compliance with Lipinski's Rule of Five, and optimal physicochemical parameters, including logP and polar surface area. These results suggest good pharmacokinetic potential and reduced likelihood of attrition in later stages of drug development. The promising in-silico outcomes support further exploration of these derivatives as dual-action candidates, offering a potential integrated therapy for diabetes and hypertension.

Keywords: Benzimidazole, 4-Thiazolidinone, PPAR-γ, Diabetes, Hypertension, Dual Therapy.

IM-HST/2025/099

Synthesis, molecular docking, and pharmacological evaluation of 5-(4-(2-(5-ethyl pyridine-2-yl) ethoxy) benzyl)-3-(phenylsulfonyl) thiazolidine-2, 4-dione against HFD-induced diabesity via interaction with the CB1 receptor

Farah Deeba[1], Mohammad Shahar Yar [2], Mohammad Rafi Haidar[3], Manju Sharma[2], Arun K. Sharma[3]

[1]Assistant Professor, Sharda University

[2]Professor SPER, Jamia Hamdard, Delhi

[3]Assistant Professor, Amity University, Haryana

Corresponding author: farah.deeba@sharda.ac.in

Abstract

Objective(s): CB1 antagonism arbitrates a dormant shape to the endocannabinoid system that alleviates diverse pathological incidents of diabesity. The present study pursued the synthesis and evaluation of thiazolidine derivative (BAC) having pleiotropic action on CB1R, with or without AM251 (selective antagonist of the CB1 receptor) against high-fat diet (HFD) induced diabesity inC57BL/6 mice.

Materials and Methods: A molecular docking study for CB1 antagonistic potential was conducted by the Maestro 11.4 program (Schrodinger Inc., USA), and the thiazolidine derivative BAC was synthesized. The assessment of varied parameters, including anthropometric, neurobehavioral, hyperglycemia, dyslipidemia, oxidative stress, and inflammatory cytokines, was evaluated in HFD-fed animals as compared with individual and combined treatments of BAC and AM251.

Results: Incomparable to AM251, the treatment of BAC was reported for a significant reduction in food intake and obesity, diabetic biomarkers, lipid profile, oxidative stress, and proinflammatory cytokine release. Moreover, the BAC treatment showed no significant alteration in neurobehavioral activity, including anxiety and depression.

Conclusion: The preliminary in silico study suggests that BAC has a close interaction with CB1 antagonism but has no sign of neurobehavioral alteration. Simultaneously, this compound showed significant ability to ameliorate diversity by the underlying mechanisms of minimizing oxidative stress, regularizing the lipid profile, and reducing pro-inflammatory cytokines.

Keywords: CB1 antagonism, endocannabinoid system, anthropometric, neurobehavioral, hyperglycemia, dyslipidemia.

A comprehensive meta-analysis of measuring hemoglobin levels in patients with head and neck cancer while they are undergoing chemotherapy

Megha Tiwari*, Mayur Porwal, Jitendra Kumar Verma

Teerthanker Mahaveer College of Pharmacy, Teerthanker Mahaveer University, Moradabad

(U.P), India.

Corresponding Author: tiwarimegha860@gmail.com

Abstract

The cancer's hemoglobin level in the patient's head and neck after the end of chemotherapy. The prognosis of patients undergoing concurrent chemotherapy and radiation therapy for locally advanced head and neck squamous cell carcinoma may be predicted using pretreatment hemoglobin levels in cancer. Anemia is a common laboratory finding in oncology that is associated with a decreased oxygen supply to cells. The radiosensitivity of tumor cells is thus impacted, which lowers the effectiveness of therapeutic interventions. Therefore, it is essential to comprehend the pretreatment hemoglobin values to forecast outcomes for patients undergoing this particular treatment plan. As a percentage of all cancer survivors, patients with head and neck cancers (HNCs) are becoming more and more numerous. The majority of earlier research was on enhancing disease outcomes, therapy, and risk categorization. The purpose of this study was to determine if nutritional status markers could predict locoregional failure following intensity-modulated radiation therapy combined with concurrent chemoradiotherapy for head and neck squamous cell cancer.

Keywords: Chemotherapy, Radiosensitivity, Carcinoma, Concomitant, Radiotherapy.

Era Of Nanorobots: Frontliners for Cancer Theranostics

Pandey A*, Mazhar. M, Paramanick. D

School of Medical and Allied Science, K. R. Mangalam University, Sohna, Gurugram, Haryana, India

Corresponding author: ambrish1.pandey@gmail.com

Abstract

Cancer is considered as the foremost pathological condition and is the primary cause for inflated life expectancy in every country of the world. Overall, cancer is associated with several risk factors expediting mortality and morbidity rates thus affecting socioeconomic development. 20 million new instances of cancer and the death is 9.7 million deaths are caused by this disease. 10 million deaths and 19.3 million new cases have been reported in 2020, according to GLOBOCAN 2020. Traditional cancer treatments are currently limited to surgery, radiation, and chemotherapy, all of which carries the risk for damaging normal tissue or incomplete eradication of the cancer. It can diffuse through the cancerous cells outer surface and then disrupt the cell membrane and squeeze out internal matrix. They have nanosensor that can detect and sense the cancerous cells via there. Most anticancer drug have limited therapeutics boundaries resulting in cytotoxicity to normal stem cells causing adverse effects likes immunosuppression, alopecia, thrombocytopenia and haematological effects. Nano robots administer the Drug targeting only the neoplasm cells and tissues by preventing the surrounding healthy cells from the toxicity of chemotherapy drugs. Nano robots provide a speed testing diagnosis initial stage and diagnosed the illness at early stage. Some challenges are Nanobots in drug delivery are Biocompatibility, biodegradation, self-propulsion, in vivo imagining. Diagnosis, detection, targeted therapy, drug screening, drug delivery, tissue engineering and Nano implants. Nanorobts in clinical medicine are used in disease diagnosis, surgery for biopsy, tissue collection and sampling. Invivo diagnosis nanomedicine can act with human body to diagnosis earlier and identify and measure the toxic chemicals and tumor cells. In conclusion by the help of Nano robots we can achieve better prognosis, evaluation of disease and reduce the side effects of chemotherapy on patient and efficient targeted drug delivery system.

Keywords: Nanorobots, Nanosensor, Nanotechnology, Cancer Theranostics, Biocompatible Nanomaterial.

Nootropic and Neuroprotective Effects of Diindolylmethane (DIM) against Scopolamine-induced brain injury in rats: impact on cholinergic activity, oxidative stress, and inflammation

Vinjavarapu Laskhmi Anusha*, Kakarla Ramakrishna

Sims college of pharmacy

Corresponding author: anushapharmacy90@gmail.com

Abstract

3,3'-Diindolylmethane (DIM), a bioactive substance sourced from cruciferous vegetables, has shown neuroprotective effects through its ability to modulate oxidative stress, inflammation, and cholinergic pathways. This research examined the impact of DIM on cognitive deficits induced by scopolamine in male Wistar rats. The subjects were categorized into six groups: Control, Scopolamine (1 mg/kg), DIM (25, 50, and 100 mg/kg), and Donepezil (5 mg/kg). Cognitive abilities were evaluated using Y-maze and Novel Object Recognition (NOR) assessments. Biochemical evaluations focused on measuring acetylcholinesterase (AChE) activity, markers of oxidative stress (MDA, SOD, CAT), and levels of NRF2 and HO-1. Additionally, inflammatory cytokines (NF-kB, TNF-α, IL-6, IL-10) and apoptosis indicators (Cytochrome C, caspases 9 and 3) were analyzed through ELISA, along with histopathological evaluations using H&E and Nissl staining. The results indicated that DIM notably enhanced cognitive performance, lowered AChE activity, and elevated acetylcholine levels. Furthermore, it reduced oxidative stress by boosting antioxidant enzyme activity (NRF2 and HO-1) and alleviated inflammation, as evidenced by decreased levels of NF-kB, TNF-α, IL-6, and increased IL-10 levels. These results underscore DIM's potential as a therapeutic agent for neuroprotection by addressing oxidative stress, inflammation, and cholinergic dysfunction.

Keywords Diindolylmethane, Scopolamine, Memory impairment, Cholinergic dysfunction, oxidative stress, neuroinflammation, and Neuroprotection.

Exploring The Mechanisms of Renal Ischemic Preconditioning

Renu Lata, Ashish Kumar Sharma*

NIMS University, Jaipur, Rajasthan

Corresponding author: ashishksharma2003@yahoo.com

Abstract

Renal ischemia-reperfusion injury (IRI) is a critical clinical issue associated with numerous conditions, including renal transplantation, partial nephrectomy, cardiovascular surgery, and shock. IRI is a leading cause of acute kidney injury (AKI), contributing considerably to morbidity and death globally. Ischemic preconditioning (IPC) is a potential protective technique that involves short, non-lethal bouts of ischemia and reperfusion, which provide resistance to future extended ischemic assaults. IPC was first characterized in the myocardium (CHARLES E. MURRY, 1986), but it has since been discovered in a variety of organs, including the kidney. IPC has demonstrated great potential in renal tissues for decreasing ischemia-induced structural and functional damage, making it a promising target for pharmacological intervention. Renal ischemia-reperfusion damage (IRI) remains a significant clinical issue, leading to acute kidney injury and poor transplant outcomes. Ischemic preconditioning (IPC), which refers to short, non-lethal periods of ischemia followed by reperfusion, has emerged as a viable technique for reducing renal IRI. Furthermore, IPC stimulates adaptive responses in renal tubular epithelial cells, boosts antioxidant defense, and lowers apoptosis via modulating survival kinases such PI3K/Akt and ERK1/2. This talk will investigate the changing molecular landscape of renal IPC, combine experimental and clinical data, and propose future avenues for leveraging IPC in precision nephroprotection therapies. Understanding the pharmacological foundations of IPC and its molecular mediators may lead to the development of IPC-mimicking medications, known as pharmacological preconditioning agents, with translational promise for clinical contexts where renal IRI is expected. The purpose of this study is to thoroughly investigate the processes of renal ischemia preconditioning, including its molecular mediators, experimental models, and prospective therapeutic applications in nephroprotective pharmacology.

Keywords: Renal ischemia-reperfusion injury, ischemic preconditioning, mitochondria, adenosine signaling, oxidative stress, survival kinases, renal transplantation.

Liver Tonics: Hepatoprotective Potential of Medicinal Plants

Vaishnavi Sahu*, Dr. Mamta Tiwari

School of Pharmaceutical Sciences, Chhatrapati Shahu Ji Maharaj University, Kalyanpur, Kanpur-208024

Corresponding author: sahuvaishnavi22@gmail.com

Abstract

Liver, the largest gland functioning as an organ of storage, manufacturing and biotransformation is a vulnerable target for injury. Chronic alcohol consumption, exposure to toxic chemicals and certain drugs like paracetamol, tetracycline, antitubercular drugs, chemotherapeutic agents, NSAIDS, damage the liver cells (hepatocytes) in long run. Modern medicine has provided us many drugs that alleviate liver diseases but compared to it herbal medicine is preferred because the latter is cost effective and considered to be a safe approach for treatment with minimal side effects. Through the decades many scientists, researchers have reported hepatoprotective activity of many medicinal plants mostly in the form of plant extracts. Many herbs have been used to alleviate various liver diseases, of which the most popular ones include Silymarin from *Silybum marianum,* andrographolide and neoandrographolide from *Andrographis paniculata*, curcumin from *Curcuma longa*, picroside and kutkoside from *Picrorrhiza kurroa*, phyllanthin and hypophyllanthin from *Phyllanthus niruri*, glycyrrhizin from *Glycyrrhiza glabra*, etc. They all having strong antioxidative potential and cause induction of antioxidant enzymes like superoxide dismutase, reduced glutathione and catalase. Additional mechanisms of hepatoprotection include stimulation of heme oxygenase-1 activity, hepatocyte apoptosis and nuclear factor-κB activation. The hepatoprotective potential of several herbal medicines has been clinically evaluated. Significant efficacy has been seen with silymarin, glycyrrhizin and Liv-52 in treatment of hepatitis, alcoholic liver disease and liver cirrhosis. However, further research is needed to identify, characterize, and standardize the active ingredients, useful compounds, and their preparations for the treatment of liver diseases.

Keywords: Hepatoprotective activity, Hepatocyte apoptosis, Chemotherapeutic agents, NSAIDS.

Green Analytical Chemistry Approaches in Pharmaceutical Analysis

Sejal Prajapati*, **Kinjal Parmar**

Parul Institute of Pharmacy and Research, Parul University, Vadodara, Gujarat, 390019

Corresponding author: prajapatisejal667@gmail.com

Abstract

These days, quality control and pharmaceutical research both heavily rely on environmental sustainability. Conventional analytical methods, while highly effective, often rely on toxic organic solvents, produce large quantities of chemical waste, and consume significant energy, raising concerns about safety, cost, and ecological impact. Green Analytical Chemistry (GAC) offers a sustainable solution by integrating eco-friendly practices into method development and validation, without compromising analytical performance. Using smaller, solvent-free techniques like solid-phase microextraction and supercritical fluid chromatography, as well as replacing safer solvents with greener ones like water, ethanol, or ionic liquids, are crucial strategies. Combining these tactics with the principles of Quality by Design (QbD) reduces the need for trial-and-error experimentation while enabling strong quality assurance and efficient process optimization. Additionally, GAC is in line with the 12 green chemistry principles, which emphasize energy efficiency, cleaner solvents, and waste reduction. These procedures enhance laboratory safety and operational cost-effectiveness in addition to meeting regulatory requirements. likewise, the merging of digital tools and artificial intelligence is speeding up the adoption of more ecologically friendly techniques in pharmaceutical analytics. The shift toward GAC highlights its potential to revolutionize pharmaceutical quality control by balancing analytical reliability with environmental responsibility. As sustainability becomes a global priority, GAC offers a pathway for the pharmaceutical industry to reduce its ecological footprint while maintaining high-quality standards.

Keywords: Green analytical chemistry, pharmaceutical analysis, quality by design (QbD), eco-friendly techniques, sustainability.

Synthesis, characterization, biological evaluation, and in silico studies of benzimidazole derivatives

Abinash Barik*, Arnika Majumder

Department of Pharmacy, Tripura University (A Central University)

Suryamani Nagar, Pin- 799022, West Tripura

Corresponding Author: abinashbarik811@gmail.com

Abstract

This research explored the design, synthesis, structural validation, and antimicrobial evaluation of novel 2-(5-methoxy-1H-benzo[d]imidazol-2-ylthio)-N-arylacetamide derivatives. The synthetic pathway involved preparing N-chloroacetyl aryl amines, which were then coupled with 2-mercaptobenzimidazole under reflux in alcoholic potassium hydroxide. The compounds were structurally confirmed using IR, NMR, and mass spectrometry, ensuring purity and correct molecular frameworks. Antimicrobial activity was tested against bacterial and fungal strains by broth dilution to determine MIC values. In addition, in silico molecular docking studies were performed to predict the binding interactions of the synthesized derivatives with microbial target enzymes, supporting their potential mechanism of action. Results revealed that derivatives containing electron-donating groups such as methoxy and methyl substitutions displayed superior antimicrobial effects. The findings highlight the importance of substitution patterns in improving biological activity. Collectively, the experimental and computational studies suggest that these tailored benzimidazole derivatives could serve as promising antimicrobial candidates and provide a basis for further pharmacological development against resistant pathogens.

Keyword: Mercaptobenzimidazole, IR, NMR, mass spectrometry, in silico molecular docking studies.

IM-HST/2025/107

From Targets to Tech: The Evolving Landscape of Anti-Obesity Pharmacotherapy and Innovation

Ayesha Fatima*[1], Fatima Umaira Saeed[1], Hafsa Jabeen[2]

[1] Department of Pharmacy Practice, RBVRR Women's College of Pharmacy, Osmania University, Hyderabad, Telangana

[2] Clinical Research Co-Ordinator, ClinArion Research Pvt. Ltd, Hyderabad, Telangana

Corresponding Author: ayesha18hassan@gmail.com

Abstract

Background: Obesity is a major global health challenge projected to affect over half the world's population by 2035, necessitating advanced therapeutic strategies due to the ineffectiveness of traditional lifestyle interventions.

Aim: This review's objective is to evaluate the evolution of obesity management by focusing on the integration of new pharmacological and technological solutions.

Methodology: A structured search was conducted from 2000 to 2025 across PubMed, Scopus, Web of Science, and Google Scholar, using keywords like "obesity pharmacotherapy," "GLP-1 receptor agonists," and "digital health in obesity." The review included RCTs, meta-analyses, systematic reviews, and regulatory documents.

Results: The evolution of obesity treatment is shifting from single-target drugs to a multifaceted approach. Novel pharmacological agents, such as GLP-1 receptor agonists (e.g., semaglutide) and dual/triple agonists (e.g., tirzepatide, retatrutide), have shown superior efficacy, with some achieving over 20% weight loss. Non-pharmacological innovations include gut microbiome modulation (probiotics, prebiotics, FMT) and digital health platforms (wearables, AI, telemedicine) to enhance adherence and personalize care. Future directions involve precision medicine, multi-omics, and advanced drug delivery systems to overcome current challenges like side effects, cost, and adherence issues.

Conclusion: The new multimodal approach to obesity management combines pharmacotherapy and digital tools to address biological and behavioural aspects.

Keywords: Obesity management, Anti-obesity medications, digital health in obesity, semaglutide, gut microbiome.

Formulation and Evaluation of Terbinafine-Loaded Invasomes with Linalool as Herbal Terpene Penetration Enhancer for Onychomycosis

Isha Gupta[1]*, Syeda Nashvia Adin[2], Mohd Mujeeb[2], Mohd Aqil[3]

[1]Department of Pharmacognosy, College of Pharmacy, SGT University, Haryana

[2]Department of Pharmacognosy, School of Pharmaceutical Education and Research, Jamia Hamdard, New Delhi

[3]Department of Pharmaceutics, School of Pharmaceutical Education and Research, Jamia Hamdard, New Delhi

Corresponding author email: isha_cop@sgtuniversity.org

Abstract

Introduction: Onychomycosis, a chronic fungal infection of the nail, remains a therapeutic challenge due to the limited permeation of antifungal agents through the keratinized nail plate. Terbinafine, although effective systemically, exhibits limited efficacy in topical dosage forms. Invasomes, phospholipid-based elastic nanovesicles enriched with ethanol and terpenes, provide a promising strategy for enhancing transungual drug delivery. Linalool, a naturally occurring monoterpene from essential oils, acts as a safe and effective herbal penetration enhancer with additional antifungal potential.

Materials and Methods: Terbinafine-loaded invasomes were prepared using the thin-film hydration method with phospholipids, ethanol, and linalool as the penetration enhancer. Formulations were evaluated for vesicle size, polydispersity index, zeta potential, entrapment efficiency, and deformability. In vitro drug release and ex vivo permeation studies through keratin films were performed. Antifungal activity of the optimized formulation was tested against *Trichophyton rubrum* and *Candida albicans.*

Results and Discussion: The optimized invasomes displayed vesicle size below 200 nm, high entrapment efficiency (>80%), and superior deformability compared to conventional liposomes. Incorporation of linalool significantly enhanced terbinafine permeation across keratin barrier, achieving \~2–3 fold higher drug penetration than plain terbinafine gel. Antifungal assays demonstrated enhanced inhibitory zones against dermatophytes, indicating synergistic activity of terbinafine and linalool. Stability studies confirmed the robustness of the optimized formulation under ICH conditions.

Conclusion: Terbinafine-loaded invasomes incorporating linalool as an herbal terpene penetration

enhancer showed improved nail permeability, higher antifungal efficacy, and reduced systemic exposure. This novel formulation approach holds strong potential as an effective and safer topical therapy for onychomycosis.

Keywords: Onychomycosis; Terbinafine; Invasomes; Linalool; Transungual drug delivery.

Bilosomes as a Novel Vesicular Carrier for Enhanced Topical Drug Delivery

Subhajit Das*, Manisha Lallan

Faculty of Pharmacy, Parul Institute of Pharmacy and Research, Parul University, Vadodara, 391760, Gujarat, India

Corresponding Author: Subhajitdas2001.22@gmail.com

Abstract

The skin's formidable barrier, the stratum corneum, presents a significant challenge to the effective topical delivery of therapeutic agents. To overcome this, various novel drug delivery systems have been developed, with vesicular carriers being a prominent category. Bilosomes are specialized flexible vesicles constructed from non-ionic surfactants or phospholipids, cholesterol, and bile salts that function as edge activators, making them an emerging and promising drug delivery tool. The incorporation of bile salts imparts superior elasticity and flexibility to the vesicles, enabling them to squeeze through the narrow intercellular spaces of the stratum corneum without rupture. This review provides a comprehensive overview of bilosomes, detailing their composition, structure, and mechanisms of skin permeation. It also discusses various methods of preparation and key characterization parameters, such as vesicle size, entrapment efficiency, and deformability. Furthermore, this paper reviews recent studies demonstrating the successful application of bilosomes for enhancing the topical delivery of a wide range of therapeutic agents, including anti-inflammatory, antifungal, and antioxidant drugs. Finally, it addresses the advantages, current challenges, and future perspectives of using bilosomes as a next-generation carrier for improved dermatological therapy.

Keywords: Bilosomes, Topical Drug Delivery, Vesicular Carrier, Skin Permeation, Bile Salts, Deformable Vesicles.

Targeting of Inflammatory Mediators Using Phytoconstituents for Treating Rheumatoid Arthritis

Renu Tiwari*, Shaweta Sharma

School of Medical and Allied Science, Galgotias University, Greater Noida

Corresponding Author: renu1986tiwari@gmail.com

Abstract

Rheumatoid arthritis (RA) is an autoimmune inflammatory disorder characterized by the continuous inflammation of the synovial lining of joints, marked by immune cell infiltration and hyperplasia of synovial fibroblasts, leading to the breakdown of articular cartilage and erosion of bone. This study will include detailed information and findings from recent research on phytochemicals identified as having possible anti-arthritic properties, along with the molecular pathways targeted to regulate the course of rheumatoid arthritis (RA). Phytochemicals have been demonstrated to operate via various mechanisms in rheumatoid arthritis (RA), including the modulation of inflammatory signaling pathways, T cell differentiation, the suppression of angiogenic factors, the induction of apoptosis in fibroblast-like synoviocytes (FLS), and the inhibition of the autophagic pathway by targeting High-mobility group box 1 protein (HMGB-1), the Akt/mTOR pathway, and HIF-1α-mediated Vascular Endothelial Growth Factor (VEGF) expression, as well as the HIF-1α complex. Standard therapies, such as non-steroidal anti-inflammatory medications (NSAIDs), corticosteroids, and disease-modifying antirheumatic medicines (DMARDs), frequently exhibit considerable adverse effects and restricted long-term effectiveness. There is more and more evidence that phytoconstituents, which are bioactive substances found in medicinal plants, have strong anti-inflammatory and immunomodulatory effects. These effects may make them safer and more effective treatment options. This review examines the capacity of diverse phytoconstituents to modulate essential inflammatory mediators, including TNF-α, IL-1β, IL-6, COX-2, and NF-κB, which play a pivotal role in the pathogenesis of rheumatoid arthritis (RA). Compounds like as curcumin, resveratrol, quercetin, boswellic acid, and epigallocatechin-3-gallate (EGCG) have shown encouraging preclinical and clinical results by focusing on these pathways. Additional study is necessary to corroborate these findings via clinical trials and to investigate synergistic effects with standard medications. Phytochemicals have demonstrated potential anti-arthritic effects in many animal models; however, additional clinical data is required to validate their safety, effectiveness, and interactions in humans.

Keywords: Rheumatoid Arthritis, Phytoconstituents, Inflammatory Mediators, TNF-α, IL-6, Curcumin, NF-κB, Anti-inflammatory, Herbal Medicine, Immunomodulation.

Nanosponges-Integrated Hydrogel of Essential Oils: Bridging Natural Products and Smart Drug Delivery Systems

Achal Panchal*, Janki Patel

Faculty of Pharmacy, Parul Institute of Pharmacy and Research, Parul University, Limda, Waghodia, Vadodara, 391760

Corresponding author: achalp7203@gmail.com

Abstract

Essential oils (EOs) are complex mixtures of phytoconstituents with a broad range of phytotherapeutic activity such as antimicrobial, anti-inflammatory, wound healing and antioxidant activities that makes them attractive for topical delivery and cosmeceuticals. However, clinical translation of EOs is limited by intrinsic drawbacks such as high volatility, poor aqueous solubility, chemical instability on storage, limited skin residence and concentration-dependent dermal irritation, which are the factors that reduce its efficacy, reproducibility and patient acceptability. Nanosponges protect labile EO constituents from volatilization and oxidative degradation while improving apparent solubility and enabling sustained, localized release; hydrogels provide a moist, biocompatible vehicle that increases topical residence time, reduces peak skin exposure and improves user acceptability. Together, the nanosponge–hydrogel combination addresses the principal limitations of neat EOs and converts them into pragmatic therapeutic entities suitable for topical use. Key application areas highlighted are targeted topical antimicrobial therapy, wound management and its anti-inflammatory and anti-cancer potential. By bridging phytotherapy with current nanocarrier and hydrogel technologies, the nanosponge-integrated hydrogel offers a practical approach to safer and more effective EO-based topical products aligned with current trends in advanced drug delivery.

Keywords: essential oils, nanosponges, hydrogel, topical delivery, phytotherapy.

An Outlook on the Pharmacological Activity of the Herbal Plant *Jasminum Sumback*

Poonam Verma*, Aaditya Singh, Rahul Sharma

Aryakul College of Pharmacy and Research, Lucknow, UP, India

Corresponding author: poonamverma9055@gmail.com

Abstract

The use of herbs for treating diseases dates back to ancient times. Over time, these herbs emerged as the foundation for numerous essential medications due to their diverse pharmacological and therapeutic properties. The fragrant blooming vine known as Jasminum sumback, or common Mogra, is indigenous to the Himalayas, the Caucasus, and some regions of China and India. It is well-known for its summertime blooms of fragrant white or pale-yellow star-shaped flowers. The plant prefers full sun and well-drained soil, and it grows best in temperate to subtropical areas.

In addition to its traditional therapeutic purposes, common Mogra is prized in the perfume business for its fragrant blossoms and is thought to have relaxing and anti-inflammatory qualities. Although the plant is simple to grow, it needs to be watered frequently and pruned once a year to keep its shape.

This attractive and adaptable plant is frequently used in gardens, trellises, and pots and may be reproduced from cuttings. It's crucial to distinguish it from other Mogra species that could be hazardous if ingested in excessive amounts, even though it is not toxic to people or dogs.

Jasminum sumback is a decorative plant that can be found across Asia and is commonly utilized in aromatherapy. The leaves exhibit pharmacological properties such as antiseptic, anti-spasmodic, and wound healing, as documented in ancient Indian texts (Wealth of India, 2003). The entire plant has been traditionally employed for healing chronic ulcers, tumors, and skin conditions. It serves as a treatment for hepatitis and duodenitis. J. sumback is also used to alleviate fever, diabetes, diarrhea, ringworm, ulcers, and oral eruptions. The flowers of Jasminum officinale are conventionally used as a central nervous system sedative, a gentle anesthetic, and an astringent.

Keywords: Caucasus, duodenitis, eruptions, antiseptic, anti-spasmodic, sedative, a gentle anesthetic.

Statistical Integration of Knowledge-Based, Artificial Intelligence, and Thermodynamic Models for In Silico Cocrystal Prediction: A Case Study on an NSAID–SMR System

Rupesh A Saindane*, Nilima A Thombre

Department of Pharmaceutics, MET's Institute of Pharmacy (affiliated with Savitribai Phule Pune University) Bhujbal Knowledge City, Adgaon, Nashik-422003, Maharashtra, India

Corresponding Author: rupeshsaindanre@gmail.com

Abstract

Cocrystallization offers a rational strategy to modulate physicochemical properties of active pharmaceutical ingredients, particularly in drug–drug systems. In silico screening is widely applied to identify suitable coformers, yet predictive outcomes often differ because each computational approach is based on distinct interaction principles. To overcome this limitation, we established a unified computational framework integrating six mechanistically diverse techniques: molecular docking, molecular complementarity, and hydrogen bond propensity (knowledge-based); COSMO-RS and molecular electrostatic potential surface analysis (thermodynamic); and a graph convolutional neural network model, CCGNet (artificial intelligence-based). Their outputs were consolidated using the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) to derive a consensus ranking. The framework was applied to Naproxen with nine clinically approved skeletal muscle relaxants as model systems. While individual methods yielded variable rankings, the integrated TOPSIS analysis consistently highlighted Cyclobenzaprine, Orphenadrine, and Metaxalone as the most promising coformers, whereas Baclofen ranked least favorable. Although experimental validation is planned, this study demonstrates the potential of statistical integration to efficiently shortlist coformers from large molecular libraries. To our knowledge, this is the first systematic attempt to combine diverse predictive approaches into a single interpretable platform, providing a generalizable tool for rational coformer selection and reducing dependence on trial-and-error experimentation.

Keywords: Drug-Drug Cocrystals, Molecular Docking, In-silico Predictions, Molecular Complementarity, Hydrogen Bond Propensity, COSMO-RS, Molecular Electrostatic Potential Surface, Co-Crystal Graph Network.

Repurposing Atorvastatin Calcium via PLGA Nanofibrous Films: A Sustained Localized Delivery Strategy for Diabetic Foot Ulcer Therapy

Abushakir Khan*, Manish Kumar Singh, Neelam Datt, Alka

Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Sector-II, Dr. Akhilesh Das Nagar, Ayodhya Road, Lucknow, Uttar Pradesh 226028, India

Corresponding author: abushakirkhan29@bbdniit.ac.in

Abstract

Diabetic foot ulcer (DFU) remains a severe complication of diabetes mellitus, often leading to chronic inflammation, delayed healing, and amputation risk. Despite numerous therapeutic approaches, effective localized drug delivery strategies are still lacking. Atorvastatin calcium (ATC), a lipid-lowering agent of the statin class, has recently gained attention for its pleiotropic actions, including anti-inflammatory, pro-angiogenic, and tissue-regenerative effects. Leveraging these properties, the present study explores the repurposing of ATC for DFU therapy through the development of a poly (lactic-co-glycolic acid) (PLGA) nanofibrous film. ATC-loaded PLGA nanofibers were fabricated via electrospinning and optimized using the Taguchi orthogonal array L9(3^4). Preformulation studies confirmed λ_{max} at 246.5 nm in methanol and high solubility in methanol/DMSO. The optimized film displayed uniform morphology with a mean fiber diameter of 499.91 nm, strong hydrophobicity (contact angle: 129.21°±0.90°), and controlled swelling (132.20 ± 3.81% at 24 h). The film exhibited minimal moisture uptake (6.38±0.11%), gradual degradation (up to 12.53±1.67%), and excellent entrapment efficiency (98.66%). XRD confirmed reduced crystallinity. Sustained ATC release (95.79%) over 12 days followed Higuchi kinetics (R^2 = 0.9734). These findings suggest that ATC-PLGA nanofibrous films, by repurposing a conventional statin, offer a promising localized delivery platform for accelerating wound repair in DFU.

Keywords: Atorvastatin calcium; PLGA nanofibrous film; Electrospinning; Drug repurposing; Diabetic foot ulcer; Sustained drug release.

Thiabendazole-Loaded Nanostructured Lipid Carriers: Preparation and Evaluations

Ansh Maurya*, Rukshar Parveen, Neelam Datt

Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Sector-II, Dr. Akhilesh Das Nagar, Ayodhya Road, Lucknow, Uttar Pradesh 226028, India

Corresponding author: asus928asus@bbdniit.ac.in

Abstract

Thiabendazole is a type of anthelmintic drug used to treat intestinal pinworm and strongyloidiasis infections. This BCS class II drug faces a significant obstacle to its absorption and effectiveness when administered orally as a drug due to poor aqueous solubility. Thus, this present study aimed to develop Thiabendazole-loaded nanostructured lipid carriers (NLCs) for enhanced absorption and therapeutic efficacy. Thiabendazole-loaded NLCs were created by the micro-emulsification method using Glyceryl monostearate (solid lipid), olive oil and geraniol (liquid lipids), surfactant, and co-surfactant like polysorbate 80 and poloxamer 188, and optimization was done by Box Behnken Design. Fifteen batches were prepared and characterized for various parameters such as particle size, polydispersity index, zeta potential, %Entrapment efficiency (EE), %drug release, and the optimized batch showed the particle size (194.8 nm), zeta potential (-22 mV), %EE (97.3%), %drug release (89.4%). SEM images confirmed size uniformity and shape, while DSC and TGA confirmed the stability of the dosage form and excipients.

Keywords: Thiabendazole, Anthelmintic agent, NLCs, Box Behnken Design.

Antidiabetic Potential of Chamaecostus cuspidatus

Parvinder Nagar*

R.V. Northland Institute of Pharmacy

Corresponding author: parvindernaagar9350@gmail.com

Abstract

Chamaecostus cuspidatus, widely referred to as the “insulin plant,” has emerged as a promising natural resource for diabetes management. The plant's hypoglycemic and antioxidant qualities are attributed to a variety of bioactive substances, including as flavonoids, alkaloids, tannins, saponins, and steroidal elements like diosgenin. Fresh leaves or their powdered form, which has been shown in experiments to have glucose-lowering properties, are the main forms of traditional use. However, there are a number of significant drawbacks to conventional preparations, including as low bioavailability, unclear dose, and inadequate standardization. Pharmaceutics research has turned its attention to innovative medication delivery methods and sophisticated formulations to address these issues. According to recent research, C. cuspidatus extracts have been used to create topical nanogels, phytosomes, nanoparticles, and polymeric scaffolds. In addition to increasing therapeutic efficacy and patient compliance, these strategies seek to increase solubility, stability, and targeted delivery. In animal models, gold nanoparticle conjugates and herbal nanogels have demonstrated promising results in glycemic control and diabetic wound healing. C. cuspidatus may become a unique phytopharmaceutical in the treatment of diabetes if traditional knowledge and modern pharmaceutical technology are combined.

Keywords: *Chamaecostus cuspidatus*, insulin plant, antidiabetic activity, hypoglycemic effect, phytochemicals, oxidative stress.

Phage Therapy: A Novel Approach for Antibiotic Resistance

Bichitra Sahoo*, Jainee Vashi

Parul Institute of Pharmacy and Research, Parul University, Vadodara, Gujarat,391760

Corresponding author: barshab3a@gmail.com

Abstract

The alarming trend of increasing prevalence of multidrug-resistant (MDR) bacterial infections has created an urgent need to find alternative methods of therapy. Phage therapy is one of the promising strategies that uses the lytic bacteria that selectively infect and kill the pathogenic bacteria. This has been achieved with positive clinical trials, which have also demonstrated the therapeutic effectiveness of phages against most MDR pathogens. However, the successful use of phage therapy in clinical practice may have certain challenges because of the probability of phage resistance, regulation problems, and nonstandard treatment regimens. The other interesting phenomenon in this regard is the Phage-Antibiotic Synergy (PAS) phenomenon, whereby there exist antibiotics that augment the multiplication of the phage, thus resulting in a superior impact on the microorganism and the eradication of the emergence of resistance. The efficacy of PAS depends on an invisible optimization of phage-antibiotic complexes, administration, and dosing schedules. The present trends, constraints, and perspectives of phage therapy and PAS are highlighted by this review and may become novel ways of combating MDR infections.

Keywords: Bacteriophage, Phage therapy, Bacterial disease, Drug-resistant pathogens, antimicrobial resistance.

Phytochemical Diversity, Pharmacological Potential, and Nutraceutical Applications of *Nigella sativa* and *Solanum melongena* Seeds: An Integrative Review

Km. Diksha Singh*, Dr. Ramteke Kuldeep Hemraj, Dr. Dharmendra Singh Rajput, Dr. Naveen Gupta

Patel College of Pharmacy, Madhyanchal Professional University, Bhopal, MP, India.

Corresponding Author: diks8382@gmail.com

Abstract

The seeds of Nigella sativa and Solanum melongena are becoming more effective as functional foods and nutraceuticals. Using data from in vitro, in vivo, and a few clinical investigations, this review thoroughly assesses their phytochemical compositions, bioactivities, and contemporary uses. Rich in nigellone, thymoquinone, and essential fatty acids, Nigella sativa seeds have strong anti-inflammatory, anti-cancer, antibacterial, and metabolic-regulating properties. Solanum melongena seeds, which are distinguished by their nasunin, chlorogenic acid, and phenolic acids, have potent antioxidant and cardioprotective qualities. Comparative study reveals complementary pharmacological characteristics, indicating that mixed formulations may have synergistic effects. To improve efficacy, future research should focus on large-scale randomized controlled trials, the creation of validated quality markers, and innovative formulations. Next-generation nutraceuticals that target oxidative stress, inflammation, cardiovascular health, and cognitive function may be produced by utilizing the complementary capabilities of these seeds.

Keywords*:* Nigella sativa, Solanum melongena, Phytochemicals.

Artificial Intelligence in Crossing Biological Barriers: A Review on AI-Based Strategies for Brain-Targeted Drug Delivery

Purnima Sharma, Divyank Kumar*, Shaweta Sharma

Department of Pharmacy, School of Medical and Allied Sciences, Galgotias University

Corresponding author: divyankkumar1100@gmail.com

Abstract

Neurological disorder such as Alzheimer's disease, Parkinson disease, Epilepsy, and brain tumor remain among the most challenging conditions to treat due to the limited ability of therapeutic drugs to cross the protective barriers of the central nervous system (CNS). The blood–brain barrier (BBB) serves as a highly selective interface that prevents most drugs from entering the brain, leading to poor drug bioavailability and therapeutic failure. The BBB, blood–cerebrospinal fluid barrier, and active efflux transporters form a complex defence network that restricts the passage of drugs into the brain. While essential for protecting neural tissue, these barriers significantly reduce the penetration of therapeutic agents, necessitating the development of targeted strategies to bypass or traverse them safely. Recent innovations include the use of nanoparticles, liposomes, dendrimers, polymeric micelles, and exosomes as carriers for brain-targeted drug delivery. These systems can be engineered to improve drug stability, control release kinetics, and increase residence time in brain tissues while minimizing systemic side effects. AI-driven computational models can predict BBB permeability, optimize nanocarrier design, and enable personalized drug delivery strategies. Machine learning algorithms accelerate drug screening, simulate drug–barrier interactions, and reduce the experimental burden, making drug development faster and more cost-effective. Integrating AI-based strategies with novel drug delivery platforms has the potential to revolutionize brain-targeted therapy. This approach can overcome existing biological barriers, enhance treatment precision, and open new possibilities for the management of CNS disorders.

Keywords: Blood brain barrier, Brain targeting, Nanocarriers, Artificial intelligence, CNS, Mechanical Learning.

Pharmacological Activity of PEA-Coated Ligustrazine-Loaded Liposomes for Chemical-Induced Nephrotoxicity Treatment

Divyanshu Srivastava*, Shivam Singh Chauhan, Neelam Datt

Babu Banarasi Das Northern India Institute of Technology, Sector-II, Dr. Akhilesh Das Nagar, Ayodhya Road, Lucknow, Uttar Pradesh 226028, India

Corresponding author: divyanshusrivastav0809@bbdniit.ac.in

Abstract

Nephrotoxicity is a serious clinical condition characterized by impaired renal function, caused by exposure to chemicals, drugs, and chemotherapeutic agents, resulting in decreased urine output, fluid retention, and reduced glomerular filtration rate, ultimately leading to renal failure. Ligustrazine, a BCS class II drug, a pyrazine alkaloid with vasodilatory and antioxidant activity, has shown promising results in alleviating nephrotoxicity. In this study, Ligustrazine-loaded liposomes were formulated using the Thin Film hydration method. The optimized batch was studied to analyze the nephroprotective potential in Wistar rats (200–250 g). Nephrotoxicity was induced by oral administration of paracetamol for seven days in all groups except the Positive Control. Rats were divided into five groups (n=5): Negative control, Positive control, Standard (n-acetylcysteine suspension), Ligustrazine dispersion, and Polyethyleneimine-coated Ligustrazine liposomes by the IP route. The rats were euthanized on the 8th day, and the kidneys were isolated in 7.4 pH PBS. After the completion of the study, the kidney was evaluated for Histopathological & biochemical studies. Biochemical estimations included malondialdehyde, glutathione, superoxide dismutase, and catalase levels. Results demonstrated that Ligustrazine liposomes provided significant nephroprotection and sustained release compared to the pure drug and standard. This novel liposomal system represents a promising strategy against Paracetamol-induced nephrotoxicity.

Keywords: Ligustrazine, Liposomes, Polyethyleneimine, Nephrotoxicity.

The use of Artificial Intelligence in Pharmacy

Ekagra Mishra*, Arsh Chanana

NIMS Institute of Pharmacy, NIMS University, Rajasthan, Jaipur

Corresponding author: mishraeshan352@gmail.com

Abstract

Artificial intelligence is a vast and popular sector in the healthcare and tech industries right now. The artificial intelligence uses advanced computing methods integrated with machine learning as well as deep learning. Artificial intelligence finds great use in drug development and the drug discovery process. By quickly identifying promising drug candidates, effectively carrying out clinical trials, and personalizing patient care, AI is transforming these industries. By predicting treatment outcomes, finding biomarkers for patient stratification, and improving patient recruitment, artificial intelligence is transforming clinical trials. AI also improves the manufacturing of pharmaceuticals and increases safety oversight by examining real-time data for unfavourable occurrences. Various tools also help in analyzing the drug molecule structures and identifying possible ligand receptor sites. Personalized medicine, in which each patient's treatment is customized according to their individual genetic composition, lifestyle choices, and disease features, is being driven by artificial intelligence. Through the integration of AI-powered predictive analytics with patient data, healthcare providers can create customized treatment regimens that maximize effectiveness while minimizing side effects. When it comes to target identification and validation, AI is progressing significantly. AI is also transforming the search and optimization of molecules. Artificial intelligence (AI) is transforming the pharmaceutical sector by speeding up the process of finding and developing new drugs, increasing the effectiveness of clinical trials, and making it possible to create customized treatments.

Keywords: Personalised Medicine, Polypharmacology, drug discover.

Phytochemical and Antidiabetic Potential of *Swertia chirayita*: Advances in Novel Drug Delivery Systems

Jai Rajora*

R.V. Northland Institute of Pharmacy

Corresponding author: jai.rajora954@gmail.com

Abstract

Swertia chirayita (commonly known as Chirata) is a traditional medicinal herb that has attracted considerable interest for its role in diabetes management. The plant contains diverse phytochemicals, including glycosides, xanthones, alkaloids, and flavonoids, which collectively exert antidiabetic effects. Experimental studies suggest that Chirata lowers blood glucose by stimulating insulin release, improving peripheral glucose utilization, regulating carbohydrate-digesting enzymes, and protecting pancreatic β-cells from oxidative damage. In addition, its antioxidant and anti-inflammatory actions contribute to reducing diabetes-related complications. However, the clinical benefits of Chirata are often restricted by its poor water solubility, limited absorption, and rapid degradation of bioactive compounds in the body. To address these limitations, novel drug delivery systems (NDDS) such as nanoparticles, nanoemulsions, phytosomes, and liposomal formulations are being investigated. These advanced carriers enhance solubility, stability, and bioavailability of the active constituents, while allowing sustained and targeted release. Incorporating Chirata into NDDS not only enhances therapeutic outcomes but also provides a safer complementary strategy alongside conventional antidiabetic drugs. Therefore, the integration of Chirata with modern delivery technologies offers a promising pathway for effective and holistic diabetes management, warranting further preclinical and clinical exploration.

Keywords: Chirata, Swertia chirayita, Diabetes management, Phytochemicals, Novel drug delivery system.

Synergistic Antimicrobial Strategies for Enhanced Wound Healing: A Comprehensive Review

Kaushalendra Singh*, Dipti Patel

Parul Institute of Pharmacy and Research, Faculty of Pharmacy, Parul University, P.O. Limda, Tal. Waghodiya, Dist. Vadodara, Gujarat (India)

Corresponding author: kaushalendrasingh7424@gmail.com

Abstract

Chronic wounds, loaded with persistent polymicrobial infections, present a formidable challenge to clinicians, escalating healthcare costs and patient morbidity. Our review investigates an innovative paradigm: synergistic antimicrobial combinations to enhance wound regeneration. These agents target a broad spectrum of pathogens gram-positive, gram-negative, and fungal, while promoting tissue repair at the cellular level. By synthesizing recent literature, we elucidate the pharmacological mechanisms, antimicrobial efficacy, and regenerative potential of these compounds, particularly when integrated with advanced delivery systems such as hydrogels, aerosolized sprays, and bioactive scaffolds. Hydrogels, for instance, maintain optimal moisture and achieve controlled drug release (e.g., 63.9% over 75 minutes in preclinical models), while scaffolds synergize antimicrobial action with tissue regeneration. However, significant hurdles remain. Antimicrobial resistance, with some pathogens exhibiting 11.93% high-level resistance, poses a critical threat. Cytotoxicity to healthy cells and formulation incompatibilities further complicate therapeutic development. Nevertheless, emerging strategies such as nanoparticle-mediated targeted delivery and collagen-based dressings demonstrate substantial promise in overcoming these barriers. Our analysis underscores the transformative potential of combinatorial approaches to revolutionize wound care, offering accelerated healing, reduced infection rates, and improved patient outcomes. We advocate for rigorous research to bridge existing gaps, including in vitro synergy studies against pathogens like Staphylococcus aureus and Pseudomonas aeruginosa, in vivo validation in wound models, and clinical trials to confirm safety and efficacy. This work calls for a concerted effort to advance these novel therapies, redefining treatment standards for chronic and infected wounds and addressing unmet clinical needs with precision and urgency.

Keywords: Chronic wounds, Polymicrobial infections, Synergistic antimicrobials, Wound regeneration, Hydrogel.

In-Silico insights into the multi-target Pharmacology of *Priyangu* (*Callicarpa macrophylla*)

M. Thenmozhi*

Department of Pharmacology, Captain Srinivasa Murthy Central Ayurveda Research Institute, CCRAS, M/o AYUSH, GOI.

Arignar Anna Hospital campus, Arumbakkam, Chennai 600106.

Corresponding author: thenprabhu2014@gmail.com

Abstract

Background: *Callicarpa macrophylla* (Priyangu) is traditionally used in Ayurveda for treating pain, fever and inflammation, yet its mechanistic basis remains unexplored.

Aim & Objective: This study aimed to integrate phytochemical-level ADMET/PBPK evaluation with molecular docking, dynamics and systems-level pharmacology to elucidate the multi-target mechanisms of *Priyangu*.

Materials & Methods: Phytochemicals were curated from PubChem, ChEMBL and phytochemical reports, focusing on flavonoids (luteolin, quercetin, chrysoeriol) and abietane-type diterpenoids. SwissADME and pkCSM were employed for drug-likeness, CYP liabilities and toxicity profiling. Target prediction (SwissTargetPrediction, STITCH) was followed by STRING (confidence >0.7) and Cytoscape-based clustering (MCODE), with pathway enrichment via ClueGO. Representative hubs including COX-2, MAPK14, IKKβ and TRPV1 were subjected to docking (AutoDock Vina), molecular dynamics (20 ns, GROMACS) and MM-GBSA rescoring. Simple PBPK simulations were constructed from *in-silico* PK parameters to assess exposure relative to predicted potency.

Results: Functional enrichment analysis revealed significant clustering of predicted targets in prostaglandin biosynthesis, NF-κB/MAPK signaling and cytokine-mediated pathways (FDR ≤ 3.0×10^{-10}). Bubble plot patterns indicated convergence of multiple phytochemicals on shared processes, consistent with multi-component, multi-target pharmacology. The PPI network demonstrated dense interconnections among NFKB1, IL6, COX-2 (PTGS2), MAPK14, and IKKβ, with IL6 and NFKB1 functioning as hubs bridging cytokine, prostaglandin, and kinase signaling. Docking and molecular dynamics validated stable binding of luteolin and quercetin to COX-2 and MAPK14, further supported by MM-GBSA rescoring. ADMET screening predicted good oral absorption and low toxicity, while preliminary PBPK simulations suggested systemic exposure compatible with pharmacological relevance.

Conclusion: This is the first integrated *in-silico* pipeline linking Priyangu's phytoconstituents to multi-target pharmacology.

Keywords: *Callicarpa macrophylla*, Priyangu, *In-silico*, Network pharmacology, ADMET, Phytochemicals.

Pharmacological importance of apocynin and its derivatives: A brief overview

Muslek Uddin Mazumder[1]*, Apurba Talukdar[2], Bhargab Jyoti Sahariah[2]

[1]Research Scholar, Assam Science and Technology University, Guwahati, Kamrup (M), Assam

[2]NETES Institute of Pharmaceutical Science, NEMCARE Group of Institutions, Mirza, Kamrup, Assam

Corresponding author: muslekm@gmail.com

Abstract

Apocynin is chemically known as 4-hydroxy-3-methoxyacetophenone. It is also known as acetovanillone. It is a methoxy catechol, first obtained in 1883 from the roots of *Apocynum cannabinum* (Canadian hemp). Apocynin is also obtained from plant *Picrorhiza kurroa*. It was originally utilized for the treatment of oedema and heart diseases. Apocynin has been previously studied as a therapeutic candidate for inflammation-mediated diseases. Apocynin is used as an NADPH (nicotinamide adenine dinucleotide phosphatase) oxidase (NOX) inhibitor. NOXs are a group of transmembrane enzymes found in different cells responsible transfer of electron across cell membranes. Apocynin and its derivatives were used for diverse pharmacological actions. In this review study, the pharmacological actions of apocynin and its derivatives were outlined. The different derivatives were used for cytotoxicity studies, acute lung injury, inflammation related to ulcerative colitis, antioxidant activity, and Parkinson's disease (PD), etc. This review study will help the researcher to explore the pharmacological actions of apocynin and its derivatives for their use in therapeutics.

Keywords: Diapocynin, Nitrone, NADPH Inhibitor, RAW 264.7, Mitoapocynin.

Formulation, Optimization and Characterization of Azelnidipine Nanocrystals

Ramesht Dwivedi*, Lavi, Sanjiv K. Chaudhri, Alka

Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Sector-II, Dr. Akhilesh Das Nagar, Ayodhya Road, Lucknow, Uttar Pradesh 226028, India.

Corresponding author: rameshtdwivedi2004@bbdniit.ac.in

Abstract

Azelnidipine, a dihydropyridine calcium channel antagonist, is a lipophilic antihypertensive drug with limited oral bioavailability due to poor aqueous solubility and extensive first-pass metabolism. To address these challenges, the present study focused on the formulation and optimization of Azelnidipine nanocrystals to improve solubility, dissolution rate, and overall bioavailability. Nanocrystals were prepared using high-pressure homogenization with Poloxamer-188 as a stabilizing surfactant and sodium deoxycholate as an ionic stabilizer, ensuring effective stabilization with minimal excipient concentration. A Box-Behnken Design with 16 runs was employed for statistical optimization, considering critical formulation variables. The optimized batch exhibited a particle size of 256.3 nm, zeta potential of -27.5 mV, and a polydispersity index of 0.312, indicating stability and uniform distribution. Comprehensive characterization was performed, including entrapment efficiency, FTIR analysis, pH determination, SEM, TEM, powder X-ray diffraction, saturation solubility, and stability studies under accelerated conditions. *In-vitro* dissolution studies of lyophilized nanocrystals demonstrated a significantly higher release rate as compared to the pure drug, confirming improved solubility due to nanosizing. The developed nanocrystals, therefore, offer enhanced oral bioavailability, faster dissolution, and rapid absorption, thus providing a promising approach for the effective management of hypertension.

Keywords: Azelnidipine; Nanocrystals; Homogenization; Box-Behnken Design; Bioavailability.

Breaking ground in nutraceutical medicine: Recent advancements and promising trends

Ritika Kulkarni*, Arsh Chanana

Department of Pharmaceutics, NIMS Institute of Pharmacy, NIMS University Rajasthan.

Corresponding author: ritika.kulkarni2003@gmail.com

Abstract

Nutraceutical have emerged as a vital frontier in healthcare, offering innovative solutions that bridge the gap between food and pharmaceuticals. - Nutraceuticals are mainly characterized into dietary products supplements and functional foods that provide the body with medical or health benefit. This article review provides a comprehensive overview of the recent advancements in nutraceutical medicines, focusing on their potential to revolutionize the way we approach health and well-being. We delve into cutting-edge research and clinical studies that highlight the efficacy of nutraceuticals in preventing and managing various health conditions. The review also explores the evolving regulatory landscape and consumer trends shaping the nutraceutical industry. As we navigate the ever-expanding landscape of nutraceutical medicine, this review sheds light on the promising developments and challenges that lie ahead, emphasizing their potential to reshape the future of healthcare.Nutraceuticals are dietary supplements that have shown to provide biological advantages or to offer some defence against long-term illnesses. Nutraceutical have become a billion-dollar industry in US, Europe and Japan with multiple factors contributing to the growth of nutraceutical industry in India. The Indian nutraceutical industry has been growing at 25% annually during the pandemic.

Keywords: Nutraceutical, Nutraceutical Industry, Healthy diet, functional foods, supplements.

Pharmacological Activity of Bezafibrate-Calcium Nanoparticles for Osteoporosis Treatment

Richa Ramshiromani Tripathi*, Shikha Yadav, Neelam Datt

Babu Banarasi Das Northern India Institute of Technology, Sector-II, Dr.

Akhilesh Das Nagar, Ayodhya Road, Lucknow, Uttar Pradesh 226028, India.

Corresponding author: richaramshiromanitripathi@bbdniit.ac.in

Abstract

Bezafibrate is an antihyperlipidemic drug. According to a recent literature review, bezafibrate promotes osteoblast proliferation and increases bone density, aiding in the development of healthy bones. Traditional dosage forms are less effective due to poor absorption; therefore, some innovative nanocarriers are needed to overcome current limitations. With this goal, in this study, Bezafibrate–Calcium nanoparticles (BZF– CaNPs) were prepared using the Chemical Precipitation method with Sodium Hydroxide and Calcium nitrate as precursors. The optimal batch was tested in Wistar rats for anti-osteoporotic properties. The animals were randomly divided into five groups (n=5). Group I served as the normal control and received no treatment. Group II was the osteoporosis control group, in which osteoporosis was induced by intraperitoneal injection of dexamethasone (DEX), three times a week for 21 days. Groups III to V were also subjected to the same DEX protocol to induce osteoporosis. Group III received the standard treatment with Zoledronic acid via subcutaneous injection once weekly. Group IV was treated with Bezafibrate suspension via subcutaneous injection. Group V received BZ-CNPs. On the 21st day, the animals were euthanized, and the femur bones were carefully excised and preserved for subsequent histopathological and morphological analyses. Histopathological and bone mineral density analyses demonstrated successful calcium deposition in bones, with elevated osteocalcin levels indicating enhanced bone turnover. These findings confirm that BZF–CaNPs have significant anti-osteoporotic potential and may serve as a promising therapeutic option.

Keywords: Bezafibrate, Chemical Precipitation, Calcium nanoparticles, Osteoporosis.

Formulation and Evaluation of Tofacitinib-Loaded Nanostructured Lipid Carriers

Ruby Mishra*, Divyanshi Kushwaha, Shipra Tripathi, Neelam Datt

Babu Banarasi Das Northern India Institute of Technology, Sector-II, Dr. Akhilesh Das Nagar, Ayodhya Road, Lucknow, Uttar Pradesh 226028, India.

Corresponding author: mishraruby158@bbdniit.ac.in

Abstract

Tofacitinib is a BCS-III drug used in the treatment of Rheumatoid arthritis, Psoriatic arthritis, and Ulcerative colitis. It is available in various conventional dosage forms, but is less effective due to existing limitations, such as poor permeability and penetration rate. To overcome the drawbacks of conventional dosage forms, NLCs were chosen for better penetration ability at the specific site. Thus, Tofacitinib-loaded NLCs were developed by the Micro-emulsion method. A 2^3 Full Factorial Design was used with the help of the Design Expert 12 software. Various batches were prepared and characterized for particle size, polydispersity index, Entrapment Efficiency, and *in vitro* drug release studies. The optimized batch of Tofacitinib-loaded NLCs data were obtained with particle size of 173.19nm, polydispersity index of 0.208, zeta potential of -32.5mV, Entrapment Efficiency of 89.93%, and *in vitro* release of 75.41%. Surface morphology of NLCs was confirmed by SEM. The results showed the enhancement in permeability of the drug, followed by controlled drug delivery compared to conventional & marketed formulations.

Keywords: Tofacitinib, Permeability, NLCs, Factorial Design.

Artificial Intelligence in Modern Drug Discovery: Accelerating Innovation, Reducing Costs, and Enhancing Precision

Swaraj Kumar*, Shivam Singh

Department of Pharmacology, Nims Institute of Pharmacy, Nims University Rajasthan, Jaipur 303121

Corresponding author: awaraj5hjp@gmail.com

Abstract

Artificial Intelligence (AI) is transforming the art of drug discovery through the ability to screen billions of molecules for lead compounds and the prediction of 3D protein structures. An exemplary case in point is the identification of Halicin, a new antibiotic found by MIT scientists to fight drug-resistant bacteria. AI supports the de novo design of compounds, predicts pharmacokinetics and toxicity, and optimizes drug candidates for safety and efficacy. It can also evaluate blood-brain barrier penetration, crucial for CNS therapies, and enhances patient monitoring and selection in clinical trials, thereby accelerating drug development.

Conventional drug discovery processes are famously time-intensive and expensive, with development time taking up to 14 years and prices of over $1 billion per drug. In addition, 97% of oncology candidates dropped in clinical trials are responsible for delays and escalating drug prices. AI is offering an attractive alternative by simplifying all stages of drug discovery, utilizing enormous amounts of data to detect patterns and make predictions.

This review summarizes the role of AI in drug development, emphasizing its potential to reduce costs and enable patient-specific therapies for conditions like cancer and pandemics. Despite challenges such as data quality and ethical concerns, AI is driving pharmaceutical research toward greater precision & data-driven approaches.

Keywords: Drug Discovery, Protein Structure Prediction, Toxicity Evaluation, De Novo Drug Design, Clinical trials.

Tuberculosis: A Persistent Global Health Challenge - Current Epidemiology, Drug Resistance, And Control Strategies

Ankur Das*

Nims Institute of Pharmacy

Corresponding author: dasa41148@gmail.com

Abstract

The deadliest infectious disease in the world, tuberculosis (TB) continues to pose a serious and enduring threat to global health. The current epidemiology, the growing drug resistance crisis, and the various control measures used to fight tuberculosis are all examined in this review paper. The disease, which is caused by Mycobacterium tuberculosis, mainly affects the lungs and is spread through the air. An estimated 25% of the world's population is thought to carry latent TB infection (LTBI), a huge reservoir that can develop into an infectious, active illness. In addition to outlining the typical six-month medication regimen for active TB and shorter preventive therapies for LTBI, the paper highlights the diagnostic tools crucial for case detection, ranging from conventional sputum microscopy to rapid molecular tests like GeneXpert. One of the main concerns is the increasing danger.

The increasing threat of drug-resistant TB, especially Multidrug-Resistant (MDR-TB) and Extensively Drug-Resistant (XDR-TB) strains, is a major focus. These strains require more extensive, toxic, and less effective treatments, which significantly hinder global control efforts. The BCG vaccine, infection control procedures, contact tracing, and public health initiatives focused on Directly Observed Therapy (DOT) are among the important preventive and control measures that are also assessed in this review. Along with evaluating the effectiveness of India's national control program, the paper also attempts to place India's TB burden in the Southeast Asian region and compare it to that of Western countries. This work aims to identify gaps in current strategies and inform future.

Keywords: infectious disease, tuberculosis (TB), Multidrug-Resistant (MDR-TB), Extensively Drug-Resistant (XDR-TB) strains.

Microwave-Assisted Green Synthesis and Optimization of Silver Nanoparticles Using *Delonix elata* Seed Extract

Yadav Akash Jitendra*, Sakshi, Neelam Datt, Alka

Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Sector-II, Dr. Akhikesh Das Nagar, Ayodhya Road, Lucknow, Uttar Pradesh 226028, India.

Corresponding author: akashyadav3294@gmail.com

Abstract

The increasing prevalence of microbial infections and growing resistance to conventional antimicrobials highlight the need for safe and sustainable therapeutic alternatives. *Delonix elata* (Fabaceae), a plant traditionally recognized for its strong antimicrobial potential, was investigated as a natural reducing and stabilizing agent for the green synthesis of silver nanoparticles (AgNPs). In the present study, methanolic seed extract of *Delonix elata* was employed to synthesize AgNPs using a microwave-assisted radiation method. A total of nine batches were designed and optimized using a full factorial 3^2 design, with statistical evaluation performed through GraphPad Prism software. The nanoparticles were characterized for particle size, polydispersity index (PDI), zeta potential, and entrapment efficiency. The optimized formulation showed a mean particle size of 111.1 nm, a zeta potential of –38.3 mV, a PDI of 0.228, and an entrapment efficiency of 91%. Scanning electron microscopy confirmed spherical morphology and uniform nanoscale dimensions. The findings suggest that *Delonix elata* seed extract can be effectively utilized in the sustainable synthesis of stable AgNPs. Considering its inherent antimicrobial activity, these nanoparticles demonstrate promising potential for topical applications in the prevention and management of infectious diseases.

Keywords: *Delonix elata*, Silver nanoparticles, Microwave synthesis, Antimicrobial activity, Factorial design.

Development and Evaluation of Eugenol-Loaded Transethosomal Gel for Onychomycosis: In Vitro Dose Optimization, Drug Release Profiling, and Antifungal Activity Against *Trichophyton rubrum*

Ishu Garg[1*], Shreya Rawat[2], Urmi Chaurasia[2], Tushar Negi[2], Shivani Rawat[3], Madhu Verma[4], Iti Chauhan[4]

[1]College of Pharmacy, Shivalik Campus, Shivalik University, Sherpur, Dehradun-248197, Uttarakhand, India

[2]Sardar Bhagwan Singh Post Graduate Institute of Biomedical Science and Research, Balawala, Dehradun, Uttarakhand 248161

[3]College of Engineering Roorkee University, 7th, KM Haridwar, National Highway Vardhmanpuram, Roorkee, Rehmadpur, Uttarakhand 247667

[4]ITS College of Pharmacy, NH 34, Ghaziabad, Asalat Nagar, Uttar Pradesh 201206

Corresponding author: ishupharmaceutics@gmail.com

Abstract

Onychomycosis, a severe nail infection primarily caused by *Trichophyton rubrum,* was targeted using an optimized eugenol-loaded transethosomal hydrogel. The effective dose of eugenol was established using minimum inhibitory concentration (MIC) studies using the solid dilution method. Among six transethosomal (TE) formulations, the optimal formulation, comprising 95 mg soy lecithin, 5 mg surfactant, and 10 mL ethanolic PBS (pH 7.4, 1:4) with 0.375 mg/mL eugenol, was selected based on particle size, PDI, and zeta potential. The best TEs were incorporated into a 1% Carbopol 940 gel. *In vitro* drug release and *ex-situ* permeation studies in PBS (pH 7.4) demonstrated a 15.74-fold increase in eugenol solubility and followed the Peppas-Sahlin diffusion-dependent release model. The gel exhibited pseudoplastic rheology with high mechanical strength and ease of application. Drug release reached $72.84 \pm 0.175\%$ within 12 hours, with a flux of 0.041 mg/cm²/h and a permeability coefficient of 9.2×10^{-5} m/s, showing intermediate permeation compared to pure eugenol and eugenol-loaded TEs. Antifungal activity assessed by the well diffusion method showed that the eugenol-loaded gel had comparable efficacy to fluconazole gel at equivalent doses.

Keywords: Eugenol, Transethosomes, Transethosomal gel, *Trichophyton rubrum*, Anti-fungal.

Effective Solid Lipid Nanoparticles of 3, 5, 7, trihydroxy-2(4 hydroxyphenyl)-4H-chromen-4-one used in the prevention and management of Alzheimer's disease

Km. Nidhi Verma*, Dr. Shraddha Singh Raghav

Agra Public College of Higher Education & Research

Corresponding author: nv9363161@gmail.com

Abstract

Alzheimer's disease is a progressive neurodegenerative disease characterized by oxidative stress, amyloid aggregation, neuroinflammation, and cognitive decline. In this study phytochemical (3,5,7,trihydroxy-2(4 hydroxyphenyl)-4H-chromen-4-one) is used belongs to BCS Class-II drug have mitigate oxidative and inflammatory stress, prevent neuronal apoptosis, and improve memory and learning. A new drug delivery strategy is used to enhance solubility, absorption and bioavailability issue via solid lipid nanoparticles. Thus to develop a 3, 5, 7, trihydroxy-2(4 hydroxyphenyl)-4H-chromen-4-one-loaded solid lipid nanoparticles. The solid lipid nanoparticles were prepared using the simple emulsification method. Solid lipid nanoparticles was characterized by particle size, polydispersity index (PDI), Zeta potential, Encapsulation Efficiency (%), Drug loading (%), and drug release profile. The selected Nano formulation (3, 5, 7, trihydroxy-2(4 hydroxyphenyl)-4H-chromen-4-one loaded solid lipid nanoparticles) exhibited a vesicle size of 140 nm, a PDI of 0.33 indicating uniformity, and a zeta potential of –26.15±1.2 mV, suggesting good colloidal stability. The entrapment efficiency (%) was found to be 62%, & drug loading (32 ±1.3 %). The *in-vitro* release studies showed (90.25% ±1.5). From this study it can be concluded that 3, 5, 7, trihydroxy-2(4 hydroxyphenyl)-4H-chromen-4-one is responsible for prevention and management of Alzheimer's disease via solid lipid nanoparticles.

Keywords: Neuroinflammation, polydispersity index (PDI), Encapsulation Efficiency (%), Alzheimer's disease.

Effective Nanoethosomes of 5, 7, dihydroxy-3-(4-hydroxy phenyl) chromen-4-one in the Prevention & Management of Diabetic Neuropathy

Pragati Upadhyay*, Dr. Shraddha Singh Raghav

Agra Public College of Higher Education & Research

Corresponding author: pragatiupadhyay483@gmail.com

Abstract

Diabetic neuropathy (Diabetic Complication) is a nerve damage caused by high blood sugar levels. Current therapies provide symptomatic relief. Thus, the use of phytochemical (5, 7, dihydroxy-3-(4-hydroxyphenyl) chromen-4-one) with strong antioxidant, anti-inflammatory, wound healing and neuroprotective properties shows promising results in the prevention and management of diabetic neuropathy. However, its low aqueous solubility, bioavailability, and rapid metabolism limit its clinical application. The goal of the present study is to encapsulate 5, 7, dihydroxy-3-(4-hydroxyphenyl) chromen-4-one was encapsulated into nanoethosomes which enhance solubility, bioavailability, stability, as well as efficient targeted delivery of drugs with minimal or no side effects. The nanoethosomes were prepared by a simple cold method. Further, it is evaluated for its vesicle size (nm), polydispersity index (PDI), Zeta potential (mV), Encapsulation Efficiency (%), Drug loading (%), and (%). The nanoethosomes exhibited a vesicle size of 245 ±1.3 nm, PDI value of 0.35 with a Zeta potential of –28.12 ± 1.5 mV showing good uniformity & colloidal stability. The % entrapment efficiency was found to be 56 ± 1.3% and drug loading (33 ± 1.2%). *In vitro* drug release studies showed 92.15% over 24 hours. The present study concluded that 5, 7, dihydroxy-3-(4-hydroxyphenyl) chromen-4-one loaded nanoethosomes may be efficient treatment for wound healing applications.

Keywords: Diabetic neuropathy, nanoethosomes, solubility, bioavailability, stability.

In vivo Study of *Solanum nigrum* Leaf Extract Aluminum Nanoparticles Loaded Carbopol Gel for Anti-Psoriatic Activity

Ashutosh Rai*, Ashish Kumar Gupta, Shekhar Singh

Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Lucknow, Uttar Pradesh 226028, India.

Corresponding author: ashutoshrai1132@bbdniit.ac.in

Abstract

Psoriasis is an autoimmune, chronic inflammatory skin disorder that occurs due to excessive proliferation of keratinocytes. Various synthetic drugs are available for psoriasis treatment however they have many limitations and also show side effects. *Solanum nigrum*, also known as black nightshade, belonging to Dicotyledons category, shows promising effect in treatment of psoriasis. Thus, the study aimed to prepare aluminum nanoparticles loaded gel of *Solanum nigrum* leaf extract by using microwave irradiation method. Optimized batch of *Solanum nigrum* leaf extract aluminum nanoparticles was incorporated in optimized batch of Carbopol gel and characterized for various parameters. The *in vivo* activity was performed on Wistar rats. The 3 groups prepared were Positive, Negative, and Test group. Imiquimod cream was used for inducing psoriasis. After induction of disease, *Solanum nigrum* leaf extract aluminum nanoparticles loaded gel was applied to the Test group while positive group was provided with marketed preparation till complete treatment for seven days. Histopathology was performed on skin samples to study the effect of *Solanum nigrum* leaf extract aluminum nanoparticle loaded gel on the disease. From the results it was concluded that *Solanum nigrum* leaf extract loaded aluminum nanoparticle-based gel showed better activity than marketed formulation and possessed significant anti-psoriatic activity.

Key Words: *Solanum nigrum*, Aluminum Nanoparticles, Psoriasis, Carbopol.

Estimation of Acacetin in *Buddleja asiatica* by TLC Densitometry

Ashwani Kumar*, Rahul

University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh

Corresponding author: bashwani@gmail.com

Abstract

Buddleja asiatica, commonly called butterfly bush belongs to the Loganiaceae family. The traditional uses of the plant include healing of wounds, liver protective, bronchial complaints, displaying diuretic actions, antioxidant properties, sedative, antirheumatic and analgesic. Acacetin is one of the biologically active flavonoids reported form this plant. It exhibits multiple pharmacological activities, including anti-cancer, anti-inflammation, anti-virus, anti-obesity and sedative activity. This study aims to develop an analytical method for the quantitative estimation of acacetin in *B. asiatica*. Quantitative analysis by TLC-densitometry was carried out using CAMAG TLC scanner 4 and WINCATS software version 1.4.2. Silica gel 60 F 254 aluminium-based plates, 20x20 cm having 2 mm thickness were used. The sample volume used was 10 µL. The mobile phase used was Toluene: Ethyl acetate (5:5) and plate was allowed to run upto 8 cm. After air drying, the plates were scanned at 330 nm. The method was validated as per ICH guidelines. The acacetin content in the flowers of the plant was found to be 0.54 mg/g.

Keywords: Acacetin, *Buddleja asiatica*, Densitometry.

Moringa-loaded Nanocarriers: A Novel Strategy for Wound Healing

Fatima Zehra*, Shubhanshu Goel, Moumita Barman

I.T.S College of Pharmacy, Muradnagar

Corresponding author: 2002zehrafatima@gmail.com

Abstract

Wound healing is a fundamental physiological process essential for preserving the structural integrity and functional capacity of living tissue. It involves a coordinated interplay among various cell types, including keratinocytes, fibroblasts, inflammatory cells, and endothelial cells, progressing through haemostasis, inflammation, proliferation, and tissue remodelling. Traditional treatments have challenges in adequately administering bioactive substances, highlighting the need for the advancement of sophisticated wound care systems.

Moringa species, namely *Moringa oleifera* and *Moringa peregrina*, are abundant in advantageous bioactives such as polyphenols, vitamins, tannins, saponins, flavonoids, and alkaloids, exhibiting antioxidant, antimicrobial, and anti-inflammatory properties. These phytoconstituents enhance tissue regeneration, rendering it an optimal choice for wound healing. Despite their therapeutic promise, poor solubility, stability, and bioavailability limit their clinical efficacy, warranting further investigation to optimize delivery and minimize adverse interactions.

Nanocarriers such as liposomes, nanofibers, nanoparticles, nano-emulsions, and nanogels represent a promising approach to address the inherent constraints of current treatment techniques. Encapsulation of Moringa extracts within nanocarriers enhances skin penetration, protects bioactives from degradation, and enables sustained release at wound sites. Emerging preclinical evidence highlights the efficacy of Moringa-loaded nanocarriers in promoting wound closure, attenuating inflammation and infection, and accelerating tissue repair, thereby reinforcing their potential in next-generation wound management.

Keywords: *Moringa*, wound healing, nanocarriers, phytotherapy, herbal drug delivery.

Formulation and Evaluation of Ciclopirox-Loaded Nanocrystals

Harshita Awasthi*, Komal Gupta, Shekhar Singh

Babu Banarasi Das Northern India Institute of Technology, Lucknow,

Uttar Pradesh 226028, India

Corresponding author: awasthih2019@bbdniit.ac.in

Abstract

Ciclopirox is a BCS class IV anti-fungal drug used in the treatment of dermatophytosis. As it faces challenges of low solubility and low permeability leads to poor bioavailability. Thus, this study aimed to develop Ciclopirox-loaded nanocrystals for improving solubility and permeability, thus enhancing bioavailability. Nanocrystals were prepared by the anti-solvent precipitation method by using polyvinylpyrrolidone as a polymer and sodium dodecyl sulfate as a stabilizer. Box-Behnken experimental Design was used for optimization using a three-factor experiment at three levels in Design Expert software. A total of fifteen batches were prepared and evaluated for different parameters, such as particle size, polydispersity index, zeta potential, percent entrapment efficiency, and in vitro drug release. The optimized batch showed particle size of (317.43 nm), PDI of (0.35), zeta potential of (-22.54 mV), percent entrapment efficiency of (92.5%), and 77.97 % drug release in 8 hrs. SEM images confirm the size and shape uniformity. Differential Scanning Calorimetry and Hot-stage microscopy confirmed the thermal stability of the dosage form. Thus, it may be concluded that there was an enhancement in solubility, thereby improving bioavailability.

Keywords: Ciclopirox, Nanocrystals, Dermatophytosis, Box-Behnken Design.

Design and Syntheses of Substituted Thiazole-2-Amines Schiff Bases as Anticonvulsant Agents

Mansi Pandey*, Durgesh Gupta, Geeta Mishra

Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Lucknow, Uttar Pradesh,226028, India

Corresponding author: mansinehapandey200018@bbdniit.ac.in

Abstract

Seizures are sudden, uncontrolled abnormal electrical activities in the brain. The majority of patients respond to available antiepileptic drugs (AEDs), but over 30% of population still experience drug-resistant epilepsy with side effects. The present study aimed to design and synthesize substituted thiazole 2-amino Schiff bases to explore their anticonvulsant activity. A series of substituted thiazole-2-amino derivatives (M1-M6) were synthesized by condensation reactions of various substituted aromatic aldehydes with thiazole-2-amine and piperidine as catalyst and characterized by using physicochemical and spectral techniques such as UV, IR, ^{1}H-NMR, ^{13}C-NMR and mass spectrometry. Further, molecular docking studies were carried out for target protein human gamma aminobutyric acid using PDB ID: 4COF, which showed binding energy in the range of -5.18 to -5.68kcal/mol.

The synthesized compounds were screened for anticonvulsant activity using Pentylenetetrazol (PTZ)-induced seizure models in mice. Among these compounds, M5 demonstrated the most potent activity with a percent convulsion inhibition of 66.94 ± 6.97. The findings highlight the potential of substituted thiazole Schiff bases in the discovery of safe and more effective antiepileptic agents.

Keywords: Thiazole-2-Amine, PTZ, Schiff Base, Seizures, Molecular docking.

Development and characterization of Ivermectin Silver Nanoparticles

Nitish Kumar*, Shrishti Mishra, Shekhar Singh

Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Lucknow, Uttar Pradesh 226028, India.

Corresponding author: nitish748830@bbdniit.ac.in

Abstract

Ivermectin is an anthelmintic drug that has anti-acne, anti-parasitic, and anti-microbial activity. Ivermectin has poor solubility and low bioavailability. The target of the current study was to formulate Ivermectin silver nanoparticles for the treatment of acne. The formulations were prepared by using the chemical reduction method, in which silver nitrate, ascorbic acid, and sodium citrate were utilized and optimized by a 3^3 full factorial design. A total of nine batches were prepared and characterized for particle size, dispersity Index (PDI), entrapment efficiency, zeta potential, and Percent drug release. The optimized batch had a particle size of 98.61 nm, PDI of 0.215, zeta potential of -21.6 mV, entrapment efficiency of 95.59 % and percent drug release of 83.27% in 24 hr. SEM images confirmed the size and spherical shape of nanoparticles. DSC confirmed the thermal stability of the formulation. Thus, it may be concluded that Ivermectin silver nanoparticles were successfully formulated and exhibited significant activity in the treatment of acne.

Keywords: Ivermectin, Anti-acne, silver nanoparticles, factorial design.

Pharmaceutical Technology-Based Approaches in the Development of Polymer–Lipid Hybrid Nanoparticles to Enhance Phytochemical Delivery

***Rekha Mehta, Arun Kumar Singh, Abhijeet Ojha**

Faculty of Pharmaceutical Sciences, Amrapali University

Corresponding author: rekmehta.pharma@gmail.com

Abstract

Phytochemicals possess the remarkable therapeutic potential for the prevention as well as management of various chronic diseases; however, their conventional delivery is often limited because of their poor aqueous solubility, instability in the microenvironment, rapid metabolism by gut enzymes or gut flora, and low bioavailability. Recent advances in pharmaceutical technology have focused on the development of polymer lipid hybrid nanoparticles (PLHNPs) as a novel platform to overcome these challenges and improve clinical application. PLHNPs integrate the structural advantages of polymeric nanoparticles and lipid-based nanocarriers, offering enhanced encapsulation efficiency, improved stability, and controlled drug release. Their unique architecture, comprising a polymeric core enabled for mechanical strength and a lipid shell enables site-specific and targeted delivery of phytochemicals, leads to maximizing therapeutic efficacy while minimizing systemic side effects. The potential of PLHNPs to improve the pharmacokinetic and pharmacodynamic profiles of various phytoconstituents, particularly in cancer therapy, neuroprotection, and cardiovascular disorders, has been published and proven by the Research scientist. Furthermore, PLHNPs provide opportunities for sustained drug release, reducing dosing frequency and enhancing patient compliance. Overall, PLHNPs represent a next-generation novel approach for enhancing phytochemical delivery and efficacy, paving the way for their successful application in biomedical & clinical settings.

Keywords: Pharmaceutical technology, polymer-lipid hybrid nanoparticles, phytochemicals, drug delivery, controlled release, site-specific targeting.

In-Vivo Activity of Surface Modified Hesperitin-Loaded Bilosomes for the Management of Inflammatory Bowel Disease

Saniya Khan*, **Chandransh Singh, Deepti Tripathi**

Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Sector-II, Dr. Akhilesh Das Nagar, Ayodhya Road, Lucknow, Uttar Pradesh 226028, India.

Corresponding author: saniyachaure@bbdniit.ac.in

Abstract

This study investigated the *in-vivo* activity of surface-modified Hesperitin-loaded bilosomes (EU-HES-BLs) for managing Inflammatory Bowel Disease (IBD). Surface modification of bilosomes was done with Eudragit S100, aimed at targeting the inflamed gut region. *In-vivo* studies were conducted by using an acetic acid-induced colitis model on Wistar rats. Animals were divided into five groups, each group having five animals. All the animals received acetic acid solution (4%v/v) intrarectally for 3 days to induce colitis, except group 1 (Control positive) WHICH received no treatment. Group-2 (Control negative) received acetic acid solution intrarectally and was left untreated. From day 4, Group-3 (Standard) was treated with Sulfasalazine orally, Group-4 (Test-1) received Hesperitin suspension orally, and Group-5 (Test-2) received EU-HES-BLs suspension orally, once a day for 7 consecutive days. The disease activity index, i.e. Change in weight, stool characteristics, and rectal bleeding, was observed throughout the study. After completion of the study, all animals were sacrificed and studied for histopathological changes. The result demonstrated a significant reduction in disease activity index and normal colonic structure in EU-HES-BLs as compared to other treated groups. The experimental study indicated that EU-HES-BLs could be a promising approach for the effective management of IBD.

Keywords: Hesperitin, Bilososmes, Site-Specific Delivery, In-vivo Studies, IBD.

In-Vivo Assessment of Repurposed Artesunate-Loaded Transferosomal Gel for The Management of Psoriasis

Vani*, Reena Kumari, Deepti Tripathi

Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Sector-II, Dr. Akhilesh Das Nagar, Ayodhya Road, Lucknow, Uttar Pradesh 226028, India.

Corresponding author: vanisrivastava19@bbdniit.ac.in

Abstract

Artesunate, a BCS-II drugs widely used as an antimalarial drug, has recently been repositioned in treating psoriasis. The objective of this study was to assess the anti-psoriatic potential of artesunate-loaded transferosomal gel (ART-TFs-gel). The *In-vivo* studies were conducted using an Imiquimod-induced psoriasis model on albino mice (25-30g). Animals were divided into five groups, each group having five animals. Group-I (negative control) received no treatment, and psoriasis was not induced; in Group-II (positive control), psoriasis was induced with Imiquimod cream, and animals were left untreated. In Groups-III (Standard), IV (Test- I), and V (Test-II), animals were induced with psoriasis and treated topically once a day from day 7 to 12. Group-III animals were treated with Betamethasone Dipropionate cream, Group- IV received ART-gel, and Group-V received ART-TFs-gel. Psoriasis area severity index (PASI) scoring was done throughout studies, and after completion of the study, animals were sacrificed, and the excised skin was used to perform histopathological evaluations. The cumulative PASI scores showed a substantially lower score, and histopathological images displayed nearly normal skin with minimal keratosis in the Test-II group, as compared to the positive control. The results suggest that ART-TFs-gel could be a promising approach for the effective management of psoriasis.

Keywords: Repurposing, Artesunate, transferosomes, *in-vivo* studies, Psoriasis.

Showing Artificial Intelligence in the Sensing of Breast Cancer

Aanchal Dahiya*

IIMT College of Pharmacy, Greater Noida, Uttar Pradesh-201306

Corresponding author: aanchalredhu@gmail.com

Abstract

Breast cancer is one of the most common causes of mortality among women worldwide, highlighting the importance of early detection and accurate diagnosis. Artificial intelligence (AI) has emerged as a transformative tool in breast cancer detection, particularly through machine learning and deep learning applications. These technologies analyze mammograms, ultrasounds, and histopathological images with greater speed and precision, offering significant improvements over conventional methods. Data preprocessing techniques such as image enhancement and noise reduction further strengthen model performance, while evaluation metrics like sensitivity, specificity, and accuracy ensure reliability.

However, challenges remain, including the availability of high-quality datasets, ethical concerns, interpretability of AI models, and integration into clinical practice. Addressing these issues is crucial for widespread adoption. AI also shows promise in personalized healthcare by combining imaging with genetic and clinical data, paving the way for tailored treatment approaches. Mammogram-based automated detection plays a particularly vital role, as mammography remains a cost-effective and accessible screening tool. AI-driven improvements in this area have the potential to enhance early diagnosis, optimize treatment planning, and ultimately save lives. Collaboration among healthcare providers, researchers, and policymakers will be essential to fully realize the benefits of AI in breast cancer management. Few extensive surveys have been provided to quickly analyse approaches for identifying breast cancer.

Keywords: Breast cancer, artificial intelligence, mammography, machine learning, personalized care.

Drug Repurposing for Treatment of Alzheimer

Azhar, Shaweta Sharma*

Department Of Pharmacy, School of Medical and Allied Science, Galgotias University

Corresponding author: shawetasharma@galgotiasuniversity.edu.in

Abstract

Drug repurposing has emerged as a promising strategy to accelerate the development of effective therapeutics for Alzheimer's disease (AD), a progressive neurodegenerative disorder characterized by memory impairment, cognitive decline, and neuropathological hallmarks such as amyloid-beta plaques and tau tangles. Traditional drug discovery for AD has faced high failure rates, prolonged timelines, and significant costs, highlighting the urgent need for alternative approaches. Repurposing existing drugs with known safety, pharmacokinetic, and toxicity profiles can substantially reduce the barriers to translation from bench to bedside. Various classes of drugs originally approved for conditions such as diabetes, hypertension, cancer, epilepsy, and psychiatric disorders have shown potential neuroprotective effects in AD through mechanisms including modulation of amyloid-beta aggregation, inhibition of tau phosphorylation, reduction of neuroinflammation, enhancement of synaptic plasticity, and improvement of mitochondrial function. For example, antidiabetic agents such as Metformin and Insulin have been investigated for their ability to improve neuronal energy metabolism, while antihypertensives like angiotensin receptor blockers are studied for reducing neurovascular dysfunction. Similarly, certain antiepileptics and antidepressants are being explored for their role in mitigating excitotoxicity and regulating neurotransmitter imbalances. Advances in computational biology, network pharmacology, and artificial intelligence have further accelerated the identification of novel repurposing candidates by uncovering shared molecular pathways between AD and other diseases. Although clinical translation remains challenging, with mixed trial outcomes and variability in patient response, drug repurposing continues to represent a cost-effective and time-efficient strategy that holds promise in expanding the therapeutic arsenal against Alzheimer's disease.

Keywords: Drug repurposing, Alzheimer's disease, neuroprotection, amyloid-beta, tau, neuroinflammation, antihypertensives, antidiabetics, antidepressants, computational pharmacology.

Scalp-Friendly Anti-Dandruff Gel: Reducing Flaking and Irritation Without Compromise

Harsh*, Vandana Singh, Satyender Kumar

Sharda University, Knowledge Park III, Greater Noida, Uttar Pradesh, 201310, India

Corresponding author: 2022483548.harsh@ug.sharda.ac.in

Abstract

Dandruff is a chronic scalp condition characterized by flaking, itching, and erythema resulting from Malassezia overgrowth, excess sebum, barrier dysfunction, and inflammation. Conventional treatments—such as shampoos containing zinc pyrithione, ketoconazole, selenium sulfide, coal tar, or salicylic acid remain standard but are limited by poor active penetration, irritation, and relapse upon discontinuation. Newer developments include nanoparticle-based delivery systems, such as ketoconazole delivered from zinc oxide using green synthesis, with increased solubility and antifungal potency. Multi-active products, such as VB-3222 shampoo, which brings together medium-chain fatty acids and zinc pyrithione, have exhibited improved fungicidal activity and substantial reductions in scalp flaking and pruritus. Moreover, plant extracts provide antifungal, anti-inflammatory, antioxidant and sebum-controlling activities with fewer side effects. Challenges remain in having sustained efficacy, minimizing irritation, enhancing sensory acceptability, maintaining stability and penetration of actives, and confirming safety among heterogeneous populations. Future studies will need to emphasize targeted delivery systems, synergistic active combinations, and robust clinical trials to yield safer, more effective, and user-friendly dandruff relief.

Keyword: Dandruff, Malassezia (yeast), Antifungal therapy, Nanoparticle delivery, Herbal extracts.

Nanoemulgel Formulation: A Modern Topical Delivery System for Effective Eczema Management

Mohd Anas*, Ayushi Tyagi

I.T.S College of Pharmacy, Muradnagar

Corresponding author: saifianas3096@gmail.com

Abstract

Nanoemulgel is an advanced topical drug delivery system that combines the advantages of nanoemulsion and gel, offering enhanced solubility, stability, and skin penetration of lipophilic drugs. The nano sized droplets provide a larger surface area for absorption, while the gel base ensures patient compliance and controlled release. This system shows great potential in dermatological applications, improving therapeutic efficacy and minimizing side effects. Eczema is a chronic inflammatory skin condition marked by itching, redness, and barrier dysfunction. Nanoemulgel formulation offer enhanced solubility, penetration, and controlled drug release, improving therapeutic efficacy. Incorporating agents like clobetasol propionate and chamomile oil provides synergistic anti-inflammatory effects for effective eczema management. Clobetasol propionate is a potent corticosteroid widely used in dermatology for treating inflammatory skin disorders. Its topical formulations provide rapid relief by reducing redness, itching, and swelling, offering effective management of conditions like eczema, atopic dermatitis. Chamomile oil, rich in bioactive compounds like bisabolol and flavonoids, exhibits strong anti-inflammatory, antioxidant, and soothing properties. It is widely used in dermatological formulation to relieve irritation, promote healing, and support management of skin disorders such as eczema and atopic dermatitis.

Keywords: Nanoemulgel, Eczema, Clobetasol propionate, Chamomile oil, Synergistic effects.

Development And Characterization of Microemulsion System Containing Itraconazole

Niharika Tiwari*

Department of Pharmaceutics, Kamla Institute of Pharmaceutical Sciences, Shri Shankaracharya Professional University, Bhilai, Chhattisgarh, India

Corresponding author: niharikatiwari1999@gmail.com

Abstract

Itraconazole, a broad-spectrum triazole antifungal agent, suffers from poor aqueous solubility and variable oral bioavailability, which limits its therapeutic potential. To overcome these challenges, a microemulsion drug delivery system was developed and characterized to enhance the solubility, stability, and bioavailability of itraconazole. Microemulsions were prepared using suitable oils, surfactants, and co-surfactants selected through solubility screening studies. The optimized formulation was characterized for particle size, zeta potential, polydispersity index (PDI), pH, viscosity, and thermodynamic stability. The drug loading efficiency and in vitro release profile were also evaluated. The optimized microemulsion exhibited a mean droplet size in the nanometer range (<200 nm) with a narrow distribution, indicating good uniformity and stability. In vitro release studies demonstrated an improved dissolution rate compared to pure drug suspension, suggesting enhanced solubility and potential for increased oral bioavailability. The results confirm that microemulsion systems are a promising approach for the delivery of poorly soluble drugs like itraconazole, offering improved therapeutic efficacy and patient compliance.

Keywords: Itraconazole, Microemulsion, Solubility Enhancement, Drug Delivery, Characterization.

In-Vivo Activity of Luliconazole Silver Nanoparticles Loaded Topical Gel for Fungal Infections

Prasoon Tripathi*, Iqbal Husain, Sanjiv Kumar Chaudhri

Babu Banarasi Das Northern India Institute of Technology Sector-II Dr. Akhilesh Das Nagar, Ayodhya Road Lucknow Uttar Pradesh 226028 India

Corresponding author: tripathikaushal99@bbdniit.ac.in

Abstract

Fungi are greatest contagious pathogens affecting the skin and mucosal membrane. Luliconazole belongs to the category of azoles and is used in the treatment of fungal infections. However, it is less effective in the existing dosage form due to poor permeability after topical preparation. Silver nanoparticles have emerged as promising antifungal agents due to their unique physicochemical properties and broad-spectrum activity. Luliconazole silver nanoparticles (LZL-AgNPs) were formulated by chemical reduction method, in which sodium borohydride and poly-vinyl pyrrolidine were utilized as reducing agent and stabilizing agent respectively. The optimized batch of LZL-AgNPs was incorporated into the optimized batch of Carbopol 934P gel. *In-vivo* activity was performed on Wistar rats (n=5), using fungal strain *Trichophyton mentagrophytes* (MTCC 7687) procured from MTCC Chandigarh, which induced fungal infections. Animals were divided into four groups; control (group I) was treated with gel base, standard (group II) was treated with marketed gel, test (group III) was treated with AgNPs, while test (group IV) was treated with LZL-AgNPs-loaded gel for seven consecutive days. Effects of LZL-AgNPs was evaluated by a histopathology study. The study concluded that LZL-AgNPs-loaded gel had better efficacy as compared to pure drug in the management of fungal infections.

Keywords: Luliconazole, Silver Nanoparticles, Topical gel, Fungal infections.

Neurodegenerative Diseases: Mechanisms and Novel Therapeutic Approaches

Rishita Singh*, Ayasha Saiffi, Swamita Arora, Sanjar Alam, Mohammad Rashid

R.V.Northland Institute, Dadri, G.B.Nagar, 203207

Corresponding author: rishitasingh0501@gmail.com

Abstract

Neuroprotection is defined as the processes and strategies that protects neural tissues from cellular incidents (such as apoptosis, degeneration, and inflammation) which is associated with chronic neurodegenerative diseases (e.g., Parkinson's disease, Alzheimer's disease, and multiple sclerosis) those derived from acute disorders (e.g., ischemia, stroke, or trauma). Neuroprotective agent is medications that can alter the course of metabolic events and show neuroprotective function. agents are needed in patients who undergone for a surgical procedure and clinical conditions that correspond with the central nervous system (CNS) and in intensive care, the neuroprotective agents are often used to prevent complications and patient deterioration. While we highlight encouraging neuroprotective strategies as well, the focus on the on neurodegenerative therapies, including neuropharmacological and cell-based approaches. Across the world, brain disorders are escalating, leading to major health challenges and reduced quality of life. Recent research suggests that a neuroprotective agent may help delay neurodegeneration, protect the brain from injury, minimize cerebrovascular damage and dementia-related decline, prevent neuronal cell death, improve mitochondrial function, alleviate depression-like symptoms, enhance learning and memory, reduce stress, and stimulate neurogenesis. Despite years of research, the neuroprotective potential and the interactions of various drugs used in anesthetic care and critical illness remain poorly understood.

Keywords: Neurodegeneration, central nervous system, neuroprotective agent, oxidative stress.

Aquasome in Topical Drug Delivery

Sachin Kumar*, **Shubhdeep Yadav**

I.T.S College of Pharmacy, Muradnagar,

Corresponding author: Sachin392000@gmail.com

Abstract

Aquasomes are an advanced class of nanocarriers developed for the effective delivery of bioactive molecules. Structurally, they consist of a solid inorganic core, a carbohydrate coating, and an outer surface that adsorbs and protects therapeutic agents. This unique "three-layer" architecture safeguards the biological activity of fragile molecules such as proteins, peptides, enzymes, vaccines, and antioxidants while enhancing their stability and pharmacological efficiency. In topical drug delivery, aquasomes provide multiple advantages. They facilitate deeper penetration through the skin layers, sustain drug release over an extended period, and protect formulations from environmental degradation caused by factors like light, temperature, and oxidation. Their ability to maintain structural integrity and prevent premature breakdown ensures improved therapeutic performance. These properties make aquasomes highly suitable for dermatological and cosmetic applications. They have demonstrated effectiveness in wound healing, anti-inflammatory therapy, antimicrobial treatment, antioxidant delivery, and skin rejuvenation. By combining stability, biocompatibility, controlled release, and enhanced skin penetration, aquasomes address major challenges faced in conventional topical formulations. Overall, aquasomes represent a promising platform for next-generation drug delivery systems, offering better therapeutic outcomes, prolonged effectiveness, and improved patient compliance in both clinical and cosmetic practices.

Keywords: Nanocarriers, Inorganic core, Carbohydrate coating, Controlled release, Biocompatibility, Stability, Skin penetration.

IM-HST/2025/153

Quantum AI for Drug Discovery

Shradha Rautela*

Department of Pharmacy Practice Shri Guru Ram Rai University

Corresponding author: rautela.shradha22@gmail.com

Abstract

Due to the Quantum AI, drug development process becomes more quicker, and contain more accurate biochemical studies and molecular simulations. While AI utilizes algorithms to identify patterns in large and complicated datasets, quantum computing process data in parallel by using two concepts: - superposition and entanglement. By combining these there will be reduce in the need of expensive, time consumption for clinical trials and investigations that lead to speed up drug development. Quantum AI also shows potential for customized medicine. It helps speeding up drug screening, finding novel drug targets, improving clinical trials, and mimicking intricate chemical interactions. This strategy demonstrated by industries such as Qubit Pharmaceuticals, Menten AI and many more. There are still some issues like limited quantum hardware, inexperienced algorithms, lack of data and integration complexity. Quantum AI can lower expenses from roughly $2.5 billion to $1 billion, also boost success rate from around 10%-30% and shorten timescales from 10years to 4years as compared to traditional drug research. To fully utilized Quantum AI advantages in pharmaceutical research in a responsible and equitable manner, further development and cooperation is essential.

Key words – Quantum AI, Drug discovery, Molecular simulations, Customized medicine.

Integrative Systems Biology and Computational Network Pharmacology Reveal Multi-Target Mechanisms of *Tylophora indica* Alkaloids against Alzheimer's Disease through *in-silico* Pharmacokinetics and Structure-Based Docking

Abdul Fairoz Ahamed*, Jennifer Fernandes

Department of Pharmaceutical Chemistry, NGSM Institute of Pharmaceutical Sciences, Nitte (DU), Deralakatte, Mangalore, Karnataka, India.

Corresponding author: fairozrkf@gmail.com

Abstract

Alzheimer's disease (AD) is a progressive neurodegenerative disorder with complex, multi-target pathogenesis, highlighting the potential of phytoconstituents as therapeutic agents. In this study, 25 alkaloids from *Tylophora indica* were screened using drug-likeness (DL ≥ 0.18), oral bioavailability (OB ≥ 0.50), and molecular weight (<500 g/mol), yielding 10 bioactive candidates. ADME evaluation indicated favorable pharmacokinetics, with high predicted human oral absorption (84–100%), balanced lipophilicity (QPlogPo/w 2.79–4.43), and negligible cardiotoxicity risk (QPlogHERG –5.24 to –5.74). Toxicity profiling identified Tyloindicine B, Tyloindicine D, and 14-Hydroxyisotylocrebrine as the safest scaffolds. Network pharmacology revealed 507 overlapping targets between the compounds and AD-related genes, with hub proteins including SRC, TNF, EGFR, CASP3, BCL2, ESR1, JUN, IL1B, HSP90AA1, and FOS. GO and KEGG analyses showed enrichment in kinase activity, apoptotic regulation, and signaling pathways such as neuroactive ligand–receptor, MAPK, PI3K-Akt, and cholinergic synapses. Molecular docking demonstrated strong binding, with Tyloindicine B (–10.875 kcal·mol^{-1}), Tyloindicine D (–9.601 kcal·mol^{-1}), and 14-Hydroxyisolycorine (–8.489 kcal·mol^{-1}) outperforming Donepezil. These results suggest that *T. indica* alkaloids, particularly Tyloindicine B and D, are promising multitarget anti-Alzheimer agents, meriting further preclinical investigation.

Keywords: *Tylophora indica*; alkaloids, Alzheimer's disease, Network Pharmacology, ADMET, Molecular docking, Hub genes.

Safety Signals of Tacrolimus: A Disproportionality Analysis Using FAERS Data

Dr. Devika. P. Sreedharan*, Dr. Adusumilli Pramod Kumar

Department of Pharmacy Practice, Faculty of Pharmacy, M. S. Ramaiah University of Applied Sciences, Bangalore, India

Corresponding author: psdevika1999@gmail.com

Abstract

Background: Tacrolimus is a widely used immunosuppressant in post-transplant patients. Its narrow therapeutic index and risk of Adverse Drug Reactions (ADRs) require continuous safety monitoring. Pharmacovigilance databases provide real-world evidence to detect potential safety signals.

Objective: To identify potential safety signals associated with tacrolimus using disproportionality analysis of FAERS data.

Methods: A retrospective analysis was conducted using FAERS data up to Quarter-1 2025, including reports listing tacrolimus as a suspect drug. Disproportionality analysis was performed using Proportional Reporting Ratio (PRR), Reporting Odds Ratio (ROR), Relative Reporting Ratio (RRR), and chi-square. A signal was defined as PRR>2, chi-square>4, with at least three case reports. Adverse events were first validated using published literature and regulatory sources, and then classified according to MedDRA SOC.

Results: A total of 31 signals were identified for tacrolimus. Significant signals included induced abortion, duodenal ulcer, and duodenitis. Most ADRs were reported under Investigations (n=8), Gastrointestinal disorders (n=5), and Pregnancy, Puerperium & Perinatal conditions (n=5).

Conclusion: Disproportionality analysis of FAERS data effectively identified both established and novel ADRs associated with tacrolimus. Continuous pharmacovigilance is essential for optimizing therapy and improving patient safety in transplant care.

Keywords: Tacrolimus, FAERS, Pharmacovigilance, Disproportionality Analysis, Safety Signals.

In Silico Screening and Molecular Docking Studies of Phytoconstituents from the Plant *Exacum tetragonum for* Anti-Diabetic Activity

Jennifer Fernandes*, Deepthi K

Department of Pharmaceutical Chemistry, NGSM Institute of Pharmaceutical Sciences, Nitte (DU), Deralakatte, Mangalore, Karnataka, India

Corresponding author: fernandesj@nitte.edu.in

Abstract

The plant *Exacum tetragonum* (*E. tetragonum*) is a plant species that has been studied for its potential antidiabetic activity. The interaction of selected molecules with their biological targets is predicted by in silico computer-aided design. The present study has performed in silico analysis to determine the antidiabetic activity of *E. tetragonum* on the enzymes alpha-amylase and alpha-glucosidase. The physicochemical and ADMET properties were determined using ADMET LAB 2.0. A docking programme was used to conduct molecular docking experiments on the phytoconstituents of *E. tetragonum* with active protein sites. All the phytoconstituents had their desired physicochemical characteristics and adhered to the Lipinski Rule of Five. The phytoconstituents were docked towards alpha amylase and alpha glucosidase to determine their potential antidiabetic activity. Among the 10 phytoconstituent derivatives, ETS and ET3 showed good docking scores towards alpha amylase and alpha glucosidase, respectively.

Keywords: *Exacum tetragonum*, Antidiabetic, ADMET Properties, Lipinski Rule, Molecular Docking.

In-silico Approach to Investigate Synthetic Schiff Base Scaffolds as Potential Anti Alzheimer's Agent

Disha S*, Jennifer Fernandes

Department of Pharmaceutical Chemistry, NGSM Institute of Pharmaceutical Sciences, Nitte (DU), Deralakatte, Mangalore, Karnataka, India.

Corresponding author: dishaullal0@gmail.com

Abstract

Alzheimer's disease (AD) is a prevalent neurodegenerative disorder worldwide, marked by decline in the acetylcholine levels, attributed to hyperactive acetylcholinesterase (AChE), leading to memory loss and cognitive impairment. Targeting AChE thus represents effective therapeutic strategy. This study presents a preliminary in-silico investigation using computer-aided drug design (CADD) to evaluate synthetic Schiff base quinoline scaffolds as potential anti-Alzheimer's agents. Donepezil served as the reference standard. Structure based computational analysis (Schrodinger 2024-2) of the 24 designed compounds assessed physicochemical properties, drug-likeness, ADME, toxicity (OSIRIS Property Explorer), and docking scores, providing initial insights into their affinity for acetylcholinesterase, pharmacokinetic feasibility, and safety before synthesis and experimental validation. Compounds 3E (-8.713), 4B (-7.697), and 1B (-7.583) exhibited the highest docking scores against acetylcholinesterase (PDB ID: 3LII), while also demonstrating low predicted risk for reproductive, mutagenic, tumorigenic, and irritant effects, along with favourable ADME properties (QikProp) and physicochemical profiles.

Keywords: Alzheimer's Disease; Schiff base; Acetylcholinesterase; Docking; OSIRIS Property Explorer.

Review on antibacterial mechanisms of nanoparticles and the latest developments in antibacterial applications

Himanshu*

School of Pharmacy, Lingayas Vidyapeeth, Faridabad, Haryana

Corresponding author: himanshusaini2291@gmail.com

Abstract

Nanoparticles (NPs) have emerged as a promising alternative in the fight against bacterial infections, especially in the context of increasing antibiotic resistance. Due to their unique physicochemical properties at the nanoscale, NPs can exert antibacterial effects through multiple mechanisms. These include disruption of bacterial cell membranes, generation of reactive oxygen species (ROS), release of toxic metal ions, and interference with essential cellular processes such as DNA replication and protein synthesis. Moreover, many nanoparticles exhibit strong anti-biofilm activity, making them effective against persistent and chronic infections. Metallic nanoparticles (e.g., silver, zinc oxide, copper oxide) and non-metallic types (e.g., carbon-based and polymeric nanoparticles) have shown broad-spectrum antibacterial activity. Recent developments in nanotechnology have focused on improving the biocompatibility, targeting ability, and controlled release of nanoparticles. Innovations such as surface functionalization, stimuli-responsive systems, green synthesis, and nanoparticle–antibiotic combinations have enhanced both their safety and antibacterial efficacy. Additionally, nanoparticles are being integrated into various applications including wound dressings, coatings for medical devices, and antimicrobial packaging. This review summarizes the antibacterial mechanisms of nanoparticles and highlights the latest advancements in their application, positioning them as valuable tools in modern antibacterial strategies.

Keywords: Nanoparticles, Antibacterial mechanisms, Reactive oxygen species (ROS), Cell membrane disruption, Latest developments.

Nano-Enabled Therapeutics for Irritable Bowel Syndrome: Integrating Conventional, Herbal, and Advanced Drug Delivery Approaches

Himanshi Saini *, Mohammad Rashid, Sanjar Alam

R. V. Northland Institute, Dadri, Gautam Budh Nagar, UP, India.

Corresponding author: sainihimanshi476@gmail.com

Abstract

Irritable bowel syndrome (IBS) is a complex functional gastrointestinal disorder characterized by abdominal pain, bloating, and altered bowel habits, with a global prevalence of approximately 10–11%. Conventional therapies, including antispasmodics, laxatives, antidiarrheals, antidepressants, and targeted antibiotics, primarily offer symptomatic relief but are often limited by suboptimal long-term efficacy. In recent years, herbal interventions such as peppermint oil, curcumin, aloe vera, psyllium, and triphala have shown promising antispasmodic, anti-inflammatory, and microbiota-modulating effects. However, their clinical utility remains restricted due to poor solubility, stability, and gastrointestinal absorption.

Advances in pharmaceutical nanotechnology offer innovative solutions to these challenges. Nano-based formulations, including nanosuspensions, Nanoemulsions, liposomes, polymeric nanoparticles, and phytosomes, enhance solubility, bioavailability, controlled release, and colon-targeted delivery of both allopathic and herbal agents. For example, eluxadoline-loaded PLGA nanoparticles have demonstrated improved therapeutic potential in IBS-D models. Such strategies not only stabilize poorly soluble phytoconstituents but also minimize dosing variability and improve patient adherence. This review provides a comprehensive synthesis of IBS epidemiology, pathophysiology, diagnostic criteria, and therapeutic approaches, with particular emphasis on integrating conventional, herbal, and nanotechnology-enabled modalities. Furthermore, it highlights translational challenges, including safety, toxicity, and regulatory concerns, while underscoring the potential of nano-herbal systems as emerging therapeutic options for IBS management.

Keywords: Irritable Bowel Syndrome (IBS), Herbal therapeutics, Nanotechnology, Nano formulations, Colon-targeted drug delivery, Phytoconstituents.

Eicosane: An Emerging Bioactive Hydrocarbon with Multidimensional Therapeutic Potential

Mohd. Bakir*, Swamita Arora, Sanjar Alam

R. V. Northland Institute of Pharmacy, Greater Noida, Uttar Pradesh, India-303207

Corresponding author: mohdbaqir93@gmail.com

Abstract

Natural hydrocarbons are gaining scientific interest for their potential biological activities, and eicosane, a straight-chain saturated hydrocarbon (C20H42), is one such compound that has been identified in various medicinal plants and essential oils. Although once considered biologically inert, recent studies suggest that eicosane may possess noteworthy pharmacological properties. Eicosane has been reported to contribute to the antimicrobial activity of several plant extracts, showing inhibitory effects against bacterial and fungal strains. Its insecticidal and pesticidal potential has also been explored, particularly in protecting crops from pest infestation, which highlights its agricultural relevance. In addition, preliminary studies suggest that eicosane may play a role in anticancer activity, possibly through the modulation of cell proliferation and induction of apoptosis; however, mechanistic insights remain limited. Apart from pharmacological benefits, eicosane has applications in the cosmetic and food industries as a fragrance component, stabilizer, and preservative. However, most of the current evidence regarding its therapeutic potential is based on in vitro studies and phytochemical screenings, with very limited *in vivo* validation or clinical translation. This review aims to summarize the available literature on the biological and pharmacological activities of eicosane, highlighting its emerging therapeutic promise and identifying research gaps that require further investigation.

Keywords: Eicosane, Hydrocarbon, Antimicrobial, Anticancer, Natural product.

Biological Activities of Cirsilineol: Insights into Its Role in Inflammation, Cancer, Metabolism, and Liver Disorders

Jayanti Kumari[1*], Swamita Arora[1], Sanjar Alam[1]

[1]R. V. Northland Institute of Pharmacy, Greater Noida, Uttar Pradesh, India-303207

Corresponding author: jayantikumari696@gmail.com

Abstract

Natural products remain an important source of new drug candidates, offering multitargeted benefits across diseases. Among them, cirsilineol, a polymethoxyflavone found in *Ocimum sanctum* (Tulsi) and *Artemisia* species, has recently gained attention for its broad pharmacological potential. Cirsilineol shows strong antioxidant and anti-inflammatory effects, helping to counter oxidative stress and chronic inflammation, two major contributors to many disorders. Experimental studies report that it suppresses inflammatory mediators such as COX-2 and NF-κB, thereby protecting tissues from damage. In cancer research, cirsilineol has demonstrated antiproliferative and pro-apoptotic activities against tumor cell lines, suggesting its promise as an anticancer agent. It has also been linked to hepatoprotective and gastroprotective actions, reflected by improved liver enzyme levels and reduced ulcerative damage in preclinical models. Other reports note antimicrobial properties, and emerging evidence indicates possible roles in metabolic regulation, with docking studies showing interactions with enzymes like α-glucosidase and DPP-4, which are relevant to diabetes management. Despite these encouraging findings, most studies are limited to *in vitro* and preliminary animal work, with scarce data on pharmacokinetics or safety. This review highlights cirsilineol's biological activities and its therapeutic potential, while underscoring the need for further *in vivo* and clinical exploration.

Keywords: Cirsilineol, Flavonoid, Antioxidant, Anti-inflammatory, Anticancer, Natural therapeutics.

Hentriacontane as a Natural Neuroprotective Candidate in Rotenone-Induced Parkinson's Disease: A Review

Khushi Bhati*, Swamita Arora, Sanjar Alam

R. V. Northland Institute of Pharmacy, Greater Noida, Uttar Pradesh, India-303207

Corresponding author: khushibhati484@gmail.com

Abstract

Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by dopaminergic neuronal loss in the substantia nigra, oxidative stress, mitochondrial dysfunction, and neuroinflammation. The rotenone-induced rat model of PD closely mimics these pathological events, making it a widely used experimental system for evaluating potential neuroprotective agents. Hentriacontane, a long-chain hydrocarbon ($C_{31}H_{64}$) present in various medicinal plants, has recently attracted attention for its promising biological properties. Although traditionally regarded as biologically inert, emerging studies highlight its anti-inflammatory and antioxidant activities, with evidence of suppressing pro-inflammatory cytokines (TNF-α, IL-1β, IL-6) and modulating NF-κB and caspase pathways. Since neuroinflammation and oxidative damage play central roles in rotenone-induced neurotoxicity, these mechanisms provide a rationale for exploring hentriacontane's protective effects in PD models. Moreover, phytochemical investigations suggest that hentriacontane-containing extracts exhibit antimicrobial, anticancer, and hepatoprotective actions, further supporting its pharmacological relevance. However, systematic evaluation in neurodegeneration, particularly in rotenone-induced PD, remains limited. This review aims to consolidate current knowledge on hentriacontane's pharmacological profile and discuss its potential as a neuroprotective candidate in PD. Future studies focusing on pharmacokinetics, blood–brain barrier penetration, and *in vivo* validation are essential to establish hentriacontane as a novel natural lead for PD management.

Keywords: Hentriacontane, Parkinson's disease, Rotenone, Neuroprotection, Natural product.

Formulation and Evaluation of Piroxicam Nano Gel-Loaded Transdermal Patches for Rheumatoid Arthritis

Gaurav Kumar*, Dr. Sanjar Alam, Mr. Yatendar Kumar

R. V. Northland Institute of Pharmacy, Greater Noida, Uttar Pradesh, India-303207

Corresponding author: gauravkumarga44667@gmail.com

Abstract

The creation of topical administration devices to promote drug penetration via the skin has drawn more interest in recent years. Medications with questionable oral administration are frequently utilized. For Rheumatoid Arthritis (RA), a chronic autoimmune disease in which the body's own tissues are mistakenly attacked by the immune system, piroxicam is a useful anti-inflammatory, antipyretic, and analgesic medication. RA primarily affects the joints and causes inflammation, which over time can cause pain, stiffness, swelling, and possible damage to bone and cartilage. However, the numerous gastrointestinal adverse effects limit its long-term oral consumption. This study's primary goal was to create and evaluate a topical piroxicam formulation based on transdermal patches filled with nanogel in order to increase the drug's rate of percutaneous penetration. Topical Nano-gel transdermal patches of piroxicam were formulated and its pharmaceutical characteristics were evaluated.

Keywords: Piroxicam, Nano Gel Transdermal Patches, Rheumatoid Arthritis, Anti-inflammatory.

Importance of Palladium catalyst in pharmaceutical chemistry

Ajet Saxena[1]*, Jyotsna Arora[2]

[1]Auriga Research Pvt. Ltd., IMT Manesar, Gurugram, India

[2]Delhi Public School, Dwarka, Delhi, India

Corresponding author: ajet@aurigaresearch.com

Abstract

The Pd/C (Palladium on charcoal i.e. Carbon support) is used from a long time in the synthetic chemistry as a catalyst. It is not only used for versatile reactions but also many other advantages like refining, recovery and recycling. During the period of research in the field of process chemistry of many APIs and new drug discovery, the role of Palladium is so important in current scenario as integral part of Pharma Industry. Many Scientists succeeded to perform the novel reactions in peculiar organic synthesis of compounds with the help of Palladium complex. More than 70% of hydrogenation reactions are carried out in the presence of Pd/C catalysts. The coupling reaction is very frequently occurred in synthesis of APIs such as Heck reaction, Suzuki–Miyaura, Mizoroki–Heck Stille couplings by using of palladium complex. The cost effective, selectivity, ecofriendly and efficacy of Palladium which are most require in Chemical industry, are fulfilled by its complex and salts.

Keywords: Catalyst, API, coupling reaction, Pharma industry, cost-effective.

3D Printing in Personalized Medicine: Revolutionizing Treatment with Customized Therapies

Arooshi*

Pharmacology Department, United Institute of Pharmacy, Prayagraj

Corresponding author: arooshi6201@gmail.com

Abstract

Beyond the traditional "one size fits all" approach, personalized medicine seeks to customize medical care to each patient's needs based on physiological, genetic, and lifestyle characteristics. In the biomedical and pharmaceutical industries, three-dimensional (3D) printing technology has become a game-changer for creating personalized medications, implants, and medical equipment. 3D printing gives precise control over drug dosage, release patterns, and the combination of numerous pharmaceuticals in a single dosage form by enabling layer-by-layer production utilizing computer-aided designs. Applications range from personalized implants and bioprinted tissues to patient-specific medication formulations and polypills. The benefits include decreased side effects, increased patient compliance, better therapeutic efficacy, and the possibility of on-demand production in distant and clinical settings. There are still a number of obstacles to overcome, though, including as material biocompatibility, regulatory barriers, technical restrictions on scalability and reproducibility, and the requirement for clinical validation. The delivery of healthcare could be revolutionized despite these obstacles thanks to continued advancements in printing technology, biomaterials, and integration with nanomedicine. With a focus on its revolutionary potential and crucial pathways to future clinical adoption, this study emphasizes the present successes and challenges of 3D printing in personalized medicine.

Keywords: Personalized medicine; 3D printing technology; Customized drug delivery; Bioprinting and implants; Nanomedicine integration.

Development And Characterization of Herbal Formulation of Curcumin and Piperine for The Treatment of Nasal Congestion and Throat Infection

Devina Vyas*, Deep Pooja

Faculty of Pharmacy, Parul Institute of Pharmacy and Research, Parul University, Vadodara,391760, Gujarat, India

Corresponding author: 2408232110006@paruluniversity.ac.in

Abstract

The present study focuses on the development and characterization of a herbal formulation containing curcumin and piperine for the treatment of nasal congestion and throat infections. Curcumin, a bioactive compound derived from Curcuma longa, exhibits potent anti-inflammatory, antioxidant, and antimicrobial properties, while piperine, an alkaloid from Piper nigrum, enhances the bioavailability of curcumin by inhibiting its rapid metabolism. The combination of these phytoconstituents offers a synergistic therapeutic effect suitable for managing respiratory discomfort associated with infections and congestion. In this study, curcumin and piperine were incorporated into a mucoadhesive herbal formulation designed for local and systemic delivery through nasal and oral routes. The formulation was evaluated for key physicochemical properties, including solubility, pH, viscosity, and stability. In addition, in vitro release studies and antimicrobial activity against common respiratory pathogens were assessed. The optimized formulation demonstrated improved curcumin absorption and effective inhibition of microbial growth, supporting its potential as a safe, natural alternative to conventional therapies. These findings suggest that a curcumin piperine herbal formulation could serve as a promising therapeutic strategy in managing nasal congestion and throat infections, while minimizing the side effects associated with synthetic drugs.

Keywords: Curcumin, Piperine, Herbal formulation, Phyto-constituents, Nasal congestion, Throat infection, antimicrobial activity, Mucoadhesive system.

Liposomal Gels: A Promising Platform for Sustained and Targeted Drug Delivery

Sanju*, Mr. Yatendra Kumar, Dr Mohammad Rashid, Dr. Sanjar Alam

R. V. Northland Institute of Pharmacy, Greater Noida, Uttar Pradesh, India-303207

Corresponding author: sanjubaba371998@gmail.com

Abstract

Through combining the benefits of hydrogels and liposomes, liposomal gels have become a viable drug delivery method that can improve therapeutic efficacy. Phospholipid bilayers form the spherical vesicles known as liposomes, which have the capacity to encapsulate both hydrophilic and lipophilic medications and provide biocompatibility and controlled release with enhanced bioavailability. However, their clinical applicability is limited due to their fast elimination and low stability. By offering a stable, viscous medium that increases drug retention, prolongs release, and improves patient compliance, liposome incorporation into a gel matrix overcomes these problems. With better permeability and tailored drug deposition than traditional formulations, liposomal gels have been thoroughly studied for topical, transdermal, ocular, and mucosal routes of drug delivery. Furthermore, there has been a lot of interest in their ability to treat malignancies, infections, inflammation, and chronic skin conditions. The composition, formulation methods, characterization approaches, and therapeutic uses of liposomal gels are the primary subject matter of this review. It also discusses current developments, difficulties with large-scale manufacturing, and prospects for creating patient-friendly, optimal dose forms in the future. In conclusion, the liposomal gels provide a flexible and cutting-edge platform technology that can be proven as a contemporary medication delivery.

Keywords: Liposomal gel, Controlled release, Transdermal delivery, Nanocarriers.

Recent Advances in Gastroretentive Floating Drug Delivery System for Antibiotics

Teenu*, Dr. Sanjar Alam, Mr. Yatendra Kumar

R. V. Northland Institute, Dadri, Gautam Budh Nagar, UP, India.

Corresponding author: teenuchaudhary5@gmail.com

Abstract

Gastroretentive floating drug delivery systems (GFDDS) are gaining attention as an effective strategy to enhance the performance of antibiotics that dissolve poorly in the small intestine or are absorbed mainly in the upper gastrointestinal tract (stomach). By staying in the stomach for longer durations, these systems improve solubility in acidic conditions, provide sustained release, and reduce dosing frequency, which may also lower the risk of resistance.

Recent progress includes the use of natural and synthetic polymers, effervescent formulations, and new excipients to improve buoyancy, swelling, and release patterns. Antibiotics such as ciprofloxacin, amoxicillin, and clarithromycin have been formulated into floating tablets, beads, and in-situ gels for the treatment of gastric infections, especially those caused by *Helicobacter pylori*.

The addition of natural gums, mucoadhesive materials, and nanocarriers has further improved stability and absorption. This review summarizes current formulation strategies, floating mechanisms, evaluation methods, and clinical insights into gastroretentive systems for antibiotics. Future work should focus on patient-friendly designs, polymer blends, and targeted delivery to maximize therapeutic benefit while minimizing adverse effects. Overall, GFDDS represent a promising tool for achieving controlled release and improved antibiotic therapy.

Keywords: Gastroretentive floating tablets, Helicobacter pylori, Natural polymers, Synthetic polymers.

Nanotechnology in Diabetes Management: Emerging Strategies for Advanced Drug Delivery

Abhishek Kumar

PhD Scholar, School of Pharmacy, Lovely Professional University, Phagwara, Punjab

Corresponding author: abhishekkrsingh16498@gmail.com

Abstract

Nanotechnology has become an increasingly important tool in modern medicine due to its ability to operate at nanoscale and enhance therapeutic outcomes. In the field of diabetes management, conventional oral therapies often face limitations such as poor bioavailability, enzymatic degradation and insufficient glycaemic control. To address these challenges, a variety of nanoparticles, liposomes, dendrimers, niosomes and micelles have been developed to improve the delivery of hypoglycaemic agents. These nanosystems offer advantages such as enhanced drug stability, controlled release & improved absorption compared with standard formulations. Functionalization of nanocarriers with specific ligands further enables targeted drug delivery, reducing systemic side effects and prolonging glucose-lowering effects. Collectively, these innovations contribute to more effective regulation of blood glucose levels and decreased risks of diabetes related complications. This review summarizes the distinctive features of major nanocarrier-based drug delivery systems and highlights recent progress in nanoparticle application for diabetes therapy.

Keywords: Nanotechnology, Diabetes Management, Nanocarriers, Nanoparticles, Liposomes, Targeted drug delivery system, Controlled release, Hypoglycaemic Control.

In-Silico Studies of Trans-3,4,4'-Trihydroxystilbene Analogues as an Anti-Hypertensive Drug

Neelabh Verma*[1], Arun Kumar Mahato[2], Ishu Garg[3]

[1]School of Pharmacy, Maya Devi University, Selaqui, Dehradun, Uttarakhand

[2]School of Pharmaceutical Sciences and Technology, Sardar Bhagwan Singh University, Balawala, Dehradun, Uttarakhand

[3]College of Pharmacy, Shivalik Campus, Dehradun, Uttarakhand

Corresponding author: neelabhverma98@gmail.com

Abstract

Hypertension remains one of the most important global health challenges, increasing the risk of cardiovascular diseases, stroke, and kidney failure. This research focuses on exploring the antihypertensive potential of trans-3,4,4'-trihydroxystilbene analogues using computer-based methods. Applying the concept of bioisosterism, a series of structural analogues was designed and analysed through molecular docking against two key targets related to hypertension: the muscarinic M3 receptor and the β-2 adrenergic receptor. Docking simulations were performed with PyRx, followed by interaction analysis using BIOVIA Discovery Studio. Several analogues showed higher binding affinities than the parent compound; among 30 analogues of the pharmacophore, one (analogue x) had the strongest interaction, with binding energies of -9.0 kcal/mol and -9.3 kcal/mol. ADMET profiling with SwissADME indicated that, of the 30 analogues, one (analogue x) had the most favourable drug-like properties, solubility, and oral bioavailability. These results support the potential of trihydroxystilbene analogues as promising candidates for antihypertensive drugs and demonstrate the value of computational drug design in early pharmaceutical research.

Keywords: Trans-3,4,4'-trihydroxystilbene; *In-silico* drug design; Antihypertensive agents; Molecular docking; Muscarinic M3 receptor; Beta-2 adrenergic receptor; PyRx; SwissADME; Bioisosterism; ADMET analysis.

Wearable Biosensors: Transforming the Future of Personalised Pharmacotherapy

Aaditya Kumar Pandey*[1], Anshika Dimri[2]

[1]PG Scholar, Siddhartha Institute of Pharmacy, Veer Madho Singh Bhandari Uttarakhand Technical University, Dehradun, Uttarakhand

[2]PG Scholar Sardar Bhagwan Singh University, Balawala, Dehradun, Uttarakhand

Corresponding Author: aditya933pandey@gmail.com

Abstract

Wearable biosensors have rapidly evolved as innovative tools that bridge the gap between pharmacology and digital health. These compact, non-invasive devices—including wristbands, adhesive patches, smart inhalers, and even contact lenses—enable continuous monitoring of physiological functions as well as drug-related responses. Unlike conventional, one-time clinical measurements, wearable biosensors provide real-time data streams that can be transmitted directly to mobile applications or healthcare professionals for immediate analysis.

In diabetes care, continuous glucose monitoring devices integrated with insulin pumps have paved the way for automated insulin delivery, functioning like an artificial pancreas. In cardiovascular medicine, wearable ECG sensors and smartwatches assist in the early detection of arrhythmias and help optimize antihypertensive and antiarrhythmic therapy. Smart inhalers, particularly useful in asthma and COPD, improve treatment adherence by recording inhaler use and sending reminders. Additionally, experimental oncology biosensors are being designed to track chemotherapy drug concentrations, reducing the risk of toxicity while maintaining therapeutic efficacy.

The impact of these technologies extends far beyond convenience: they promote personalized drug dosing, prevent complications arising from under- or over-medication, and improve patient safety. Looking forward, the integration of artificial intelligence with wearable platforms promises the development of closed-loop, predictive systems capable of automatically adjusting drug regimens. Such advancements mark a paradigm shift toward individualized, data-driven pharmacotherapy and truly patient-centered care.

Keywords: Wearable biosensors, Personalized therapy · Continuous health monitoring, Smart drug delivery, Artificial intelligence, Medication adherence, Closed-loop systems.

Artificial Intelligence in Personalised Drug Therapy: Innovations and Implications

Rishabh Bora*, **Dr. Priya Sharma, Dr. Satyender Kumar**

Sharda University, Knowledge Park III, Greater Noida, Uttar Pradesh, 201310, India

Corresponding author: 2022003268.rishabh@ug.sharda.ac.in

Abstract

Artificial Intelligence is fast revolutionizing the healthcare landscape by providing innovative solutions for improving precision and customization in drug treatment. Conventional methods of treatment may depend on standardized protocols, which might fail to consider person-to-person differences in genetic makeup, lifestyle, and the course of disease. AI with machine learning, deep learning, and predictive analytics facilitates the consolidation of large and intricate biomedical data to create customized treatment plans for patients. Through genomic profile analysis, clinical history, and real-time health information, AI systems are capable of recognizing ideal drug combinations, anticipating adverse drug reactions, and personalizing dosage regimens for optimal therapeutic outcomes. Recent breakthroughs include AI-based drug discovery platforms that speed up the discovery of new medicine molecules and clinical decision support systems that help doctors make evidence-based treatment decisions. In addition, AI makes pharmacovigilance better by tracking patient responses and identifying safety issues earlier than traditional approaches. This article discusses the innovations propelling AI in customised drug treatment and stresses the importance of interdisciplinary efforts to tap the full potential of AI in providing safer, more efficient, and patient-centric treatments.

Keywords: Artificial Intelligence, Personalised Medicine, Genomic Profiling, Pharmacovigilance.

The enteric influence on wound healing: mechanistic insights into the gut-skin Axis

Dimpi Gupta*, Lalit Parihar

R.V. Northland Institute, Dadri, Gautam Buddha Nagar, U.P., India

Corresponding author: guptadimpi262625@gmail.com

Abstract

Chronic kidney disease (CKD) is a condition where the kidneys don't work properly and get worse over time. One big risk factor for CKD is high blood pressure, which can be linked to an unhealthy balance of gut bacteria (dysbiosis). In people with CKD, this imbalance leads to a buildup of harmful substances called uremic toxins, which makes the disease progress faster.

Research shows that the connection between the gut and kidneys, known as the gut-kidney axis, is also involved in kidney stones and a kidney disease called IgAN. Scientists are studying the different types of gut bacteria, either by grouping them into categories (enterotypes) or by using specific markers to understand how they relate to a person's lifestyle, diet, and health.

Studies that look at both the gut bacteria and the body's metabolites (metabolome) are providing good results about how they interact. More research is needed to fully understand the link between gut bacteria and CKD. Studying how certain proteins and transporters in the body communicate can also give us a better picture of the gut-liver-kidney axis, which could lead to new treatments.

One promising treatment is using probiotics, which are beneficial microbes you can swallow. These microbes can help break down uremic toxins in the gut, reducing their harmful effects. More comprehensive studies are needed to confirm if probiotics can slow down kidney failure and lower inflammation.

Keywords: Chronic kidney disease, Kidney failure, Glomerular filtration rate, Gut bacteria.

Advancement in of Herbal Drugs: Integrating HPLC, LC-MS and DNA Barcoding

Himanshu Kumar, Jayendra Madhav, Dr. Gaurav Dubey

Nims Institute of Pharmacy, Nims University, Rajasthan, Jaipur

Corresponding author: hk178972@gmail.com

Abstract

The global demand for herbal drugs is rising, yet the absence of robust quality control methods poses risks such as adulteration, variability, and inconsistent efficacy. Standardization is therefore essential to ensure safety, reliability, and therapeutic value.

This review highlights three advanced approaches that are transforming herbal drug standardisation. High-Performance Thin-Layer Chromatography (HPTLC) provides a rapid, cost-effective chemical "fingerprint" for routine quality checks, batch consistency, and detection of adulterants. Liquid Chromatography–Mass Spectrometry (LC-MS), with its high sensitivity and precision, enables detailed profiling of bioactive compounds and detection of trace contaminants, ensuring chemical validation. DNA barcoding offers a reliable molecular tool for species-level identification, critical for authenticating raw materials and preventing substitution with incorrect or harmful species.

An integrated framework—HPTLC for preliminary screening, LC-MS for quantitative validation, and DNA barcoding for biological authentication—emerges as a comprehensive strategy to address existing challenges. Adoption of these complementary methods can significantly improve the quality, safety, and global acceptance of herbal medicines, while strengthening consumer confidence in natural therapeutics.

Keywords: Herbal drug standardisation, HPTLC, LC-MS, DNA barcoding, quality control.

Microbiome Modulation as a New Pharmacological Target

Peddi Jahnavi*, Shaik Shakir Basha

Department of Pharmacy, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India

Corresponding author: jahnavisreenivasulupeddi@gmail.com

Abstract

The human microbiome, comprising trillions of microorganisms residing in the gut, skin, and other tissues, plays a critical role in regulating immunity, metabolism, and neurological function. Dysbiosis, an imbalance in microbial communities, has been increasingly associated with a wide range of diseases, including inflammatory bowel disease, obesity, diabetes, cancer, and neurodegenerative disorders. Targeting the microbiome has emerged as a novel pharmacological approach to restore microbial balance and improve therapeutic outcomes. Strategies such as probiotics, prebiotics, synbiotics, fecal microbiota transplantation, and microbiome-derived metabolites are being explored to modulate microbial composition and function. Recent advances in metagenomics, metabolomics, and systems biology have enabled the identification of specific microbial targets, offering opportunities for precision and personalized interventions. Despite promising results, challenges remain, including inter-individual variability, long-term safety, regulatory considerations, and standardization of microbiome-based therapies. Continued research is essential to translate these findings into effective clinical applications. Modulating the microbiome not only provides a new paradigm for drug development but also holds potential to revolutionize personalized medicine, offering mechanism-based interventions for a variety of chronic and complex diseases.

Keywords: Human microbiome, Dysbiosis, Microbiome modulation, Probiotics, Prebiotics, Fecal microbiota transplantation, Personalized medicine, Pharmacological target.

Evolving Paradigms in Oncology: Recent Advances in Cancer Treatment Modalities

Jayendra Madhav, Himanshu Kumar, Dr Himmat Singh Chawda

Nims Institute of Pharmacy, Nims University, Rajasthan, Jaipur

Corresponding author: madhavr800@gmail.com

Abstract

Cancer is a major global cause of mortality, responsible for nearly one in every six deaths. The most prevalent cancers include breast, lung, colon, rectal, and prostate. Nearly one-third of cancer-related deaths can be attributed to tobacco use, high body mass index, alcohol consumption, insufficient fruit and vegetable intake, and lack of physical activity. Cancer treatment has always been complex. Traditional methods like surgery, chemotherapy, and radiotherapy have been used for decades; however, significant progress has been made with the introduction of targeted and gene-based therapies, modern radiation techniques, and nanoparticle-based drug delivery systems. CRISPR-Cas9 acts as a genetic editing tool enhancing precision medicine. CAR-T therapy is an immune-based treatment showing success in blood cancers. Proton beam therapy provides highly precise radiation while minimizing collateral damage. LINAC technology is fundamental to external beam radiotherapy, IMRT modifies the intensity of radiation beams for accuracy, and 3D-CRT uses shaped beams to conform to tumour geometry. Nanoparticle-based drug delivery improves efficacy by enabling controlled and targeted release at the disease site. These advances mark a paradigm shift toward precision oncology, improving both safety and outcomes.

Keywords: CRISPR-Cas9, CAR-T, Proton beam, LINAC, IMRT, JD-CRI, Nanoparticles.

Pharmacovigilance in Pediatric Populations: Addressing Challenges and Emerging Innovations

Keerti Dayal*, **Dr. Madhaw Dwivedi**

Department of Pharmacy Practice, ISF College of Pharmacy (An Autonomous College), Moga-142001, Punjab, India.

Corresponding author: dayalkeerti@gmail.com

Abstract

Introduction: Pharmacovigilance in pediatric populations is crucial for drug safety because children have unique pharmacokinetic and pharmacodynamic traits that increase their vulnerability to adverse drug reactions (ADRs). Off-label prescribing and immature organ systems further heighten the risk of drug-related issues.

Objective: This study aims to evaluate patterns of ADRs in pediatric patients and to analyze the role of pharmacovigilance systems, emphasizing the integration of artificial intelligence (AI) and global data-sharing methods to improve safety monitoring.

Methodology: Data were gathered from peer-reviewed journals, pharmacovigilance databases, and clinical studies on pediatric ADRs. Sources included PubMed, The Lancet, and the British Journal of Clinical Pharmacology, along with reports from WHO VigiBase, FAERS, and hospital-based ADR systems. A comparative analysis was performed on ADR prevalence, drug classes, severity, and preventability across different pediatric age groups.

Results: The most common ADRs identified were antibiotic-induced hypersensitivity, neurotoxic effects from antiepileptics, and gastrointestinal issues related to NSAIDs. Data from pharmacovigilance databases showed that systematic monitoring and early reporting significantly reduce drug-related risks. Variations in ADR frequency and severity were observed across distinct pediatric age groups, highlighting the need for age-specific monitoring strategies.

Conclusion: Pediatric pharmacovigilance can be improved through collaborative efforts among healthcare professionals, caregivers, and regulatory agencies. The integration of AI-based ADR detection systems and international data-sharing frameworks offers potential for enhancing reporting accuracy and therapeutic safety, ensuring that the benefits of treatment outweigh potential risks in pediatric care.

Keywords: Pharmacovigilance, Pediatric Drug Monitoring, Adverse Drug Reactions, Drug Safety, Ethical Challenges in Pediatric Trials, Real-World Evidence.

3D Printing of Personalized Medicines: The Future of Drug Delivery

Chakali Mahesh[1]*, Shaik Shakir Basha[2]

*[1]Department of Pharmacy, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India,

[2] Associate Professor, Department of Pharmaceutical Analysis, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India

Corresponding author: maheshmahesh41339@gmail.com

Abstract

Personalized medicine aims to deliver patient-specific therapies that maximize efficacy and minimize adverse effects. Among the innovative technologies, three-dimensional (3D) printing has emerged as a disruptive approach in pharmaceutical manufacturing. It enables the design of customized dosage forms with precise drug release kinetics, tailored dose strengths, and flexible geometries that improve compliance and therapeutic outcomes. Techniques such as fused deposition modeling (FDM), inkjet printing, stereolithography (SLA), and selective laser sintering (SLS) have been employed to create tablets, transdermal patches, and implantable drug delivery systems. The approval of *Spritam (levetiracetam)* by the US FDA marked a significant milestone, demonstrating the clinical applicability of 3D printed medicines. Current research is advancing towards multi-drug printing, bioprinting of tissues, and integration with nanotechnology and artificial intelligence, offering new opportunities in cancer therapy, pediatrics, geriatrics, and rare disease management. However, challenges such as regulatory acceptance, scalability, quality control, and cost must be addressed before widespread clinical adoption. Overall, 3D printing holds immense potential to transform drug delivery into a precise, patient-centered, and futuristic healthcare solution.

Keywords: 3D printing, personalized medicine, drug delivery, precision therapy, pharmaceutical technology.

Microemulgel-Based Delivery of Imidazoles: A Promising Strategy for Dermatophytic and Candidal Infections

Manita Saini[1], Shrestha Sharma[1], Syed Arman Rabbani[2]

[1]Amity Institute of Pharmacy, Amity University, Gurugram, Haryana-122412

[2]RAK Medical and Health University, Ras Al Khaimah, United Arab Emirates-11172

Corresponding author: manitasaini44@gmail.com

Abstract

Fungal skin infections, notably dermatophytosis and candidiasis, pose persistent therapeutic challenges due to chronicity, recurrence, and the emergence of antifungal resistance. Conventional topical formulations often fail to achieve consistent efficacy because of poor solubility, limited skin penetration, and suboptimal patient adherence. Among antifungal classes, imidazoles remain widely employed, acting through inhibition of cytochrome P450–dependent lanosterol 14α-demethylase and subsequent disruption of ergosterol biosynthesis. To overcome the formulation-related limitations of imidazoles, advanced drug delivery platforms are being explored. Microemulgel technology, which combines the solubilizing efficiency of microemulsions with the spreadability and patient acceptability of gels, offers thermodynamic stability, enhanced loading capacity, and improved percutaneous absorption by modulating stratum corneum permeability. Recent studies have demonstrated that optimized imidazole-loaded microemulgel exhibit favorable physicochemical attributes, sustained release, and superior skin retention, potent antifungal activity against Candida albicans and dermatophytes, and excellent tolerability. Collectively, this approach represents a promising next-generation strategy for topical antifungal therapy, addressing both therapeutic limitations and patient compliance.

Keywords: Dermatophytosis, Candidiasis, Imidazoles, Microemulgel, Topical antifungal delivery, Ergosterol biosynthesis inhibition, Percutaneous absorption, Drug resistance.

AI-Driven Drug Repurposing for Rare Diseases

Machireddy Gari Meghana Reddy[1*], Shaik Shakir Basha[2]

*[1]Department of Pharmacy, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India,

[2] Associate Professor, Department of Pharmaceutical Analysis, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India

Corresponding author: machireddymeghanamachireddymeg@gmail.com

Abstract

Rare diseases, affecting fewer than 1 in 2,000 individuals, collectively impact millions worldwide but remain neglected due to limited research investment and high drug development costs. Traditional drug discovery is expensive, time-consuming, and often unfeasible for small patient populations. Artificial Intelligence (AI)-driven drug repurposing has emerged as a transformative approach to address these challenges. By leveraging machine learning, deep learning, and network-based algorithms, AI can analyze vast biomedical datasets, including genomics, proteomics, clinical trial data, and real-world evidence, to identify novel therapeutic uses for existing drugs. This approach not only shortens development timelines but also reduces costs while ensuring safety, as repurposed drugs have established pharmacological profiles. Recent successes include the AI-assisted identification of therapies for amyotrophic lateral sclerosis, Duchenne muscular dystrophy, and certain rare cancers. In the Indian context, the integration of AI with biobanks, electronic health records, and genetic research can accelerate solutions for underdiagnosed and underserved rare disease populations. However, challenges such as data quality, regulatory frameworks, and ethical considerations must be carefully managed. Overall, AI-driven drug repurposing holds immense potential to revolutionize rare disease management, making personalized and affordable therapies more accessible.

Keywords: Artificial Intelligence, Drug Repurposing, Rare Diseases, Machine Learning, Personalized Therapy.

A Network Pharmacological approach to evaluate the effect of flavonoids in chronic stress-induced neurodegenerative diseases

Minal Y. Chaudhari[1]*, Dr. Hemant D. Une[2]

[1]Assistant Professor, Shreeyash Institute of Pharmaceutical Education and Research, Chh. Sambhajinagar

[2]Professor, Y. B. Chavan College of Pharmacy, Chh. Sambhajinagar

Corresponding author: minalchaudhari78@gmail.com

Abstract

Background: Neurodegenerative diseases are characterized by oxidative stress, protein misfolding, and impaired neurotransmission. Flavonoids such as quercetin have shown neuroprotective potential. This study applies network pharmacology to elucidate their molecular mechanisms.

Methods: Active phytochemical targets of the selected herbal drugs were retrieved from PubChem and Swiss Target Prediction databases. Neurodegenerative disease-related targets were collected from the Gene Cards database. Overlapping targets were identified, and a protein–protein interaction (PPI) network was constructed using STRING and analyzed in Cytoscape 3.7.1. Functional enrichment analysis was performed through Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathways using Shiny GO.

Results: Four common targets were identified. PPI and topological analyses highlighted RLN3, NMUR2, AKR1B1, and RXFP4 as key targets. GO analysis revealed 60 enriched biological processes, while KEGG analysis identified four significant pathways related to neuroprotection.

Conclusion: Flavonoids may exert neuroprotective effects by modulating neurotransmitter. These findings provide molecular insights into their potential therapeutic roles in neurodegenerative diseases.

Keywords: Network pharmacology; Relaxin-3; Protein disulfide isomerase; Bacopa monnieri; Green tea; Ginkgo biloba; neurodegenerative diseases.

Pharmacogenomics: Towards Personalized Medicine in India

Baddela Mohan Kumar[1*], Shaik Shakir Basha[2]

*[1]Department of Pharmacy, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India

[2] Associate Professor, Department of Pharmaceutical Analysis, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India

Corresponding author: baddelamohankumar@gmail.com

Abstract

Pharmacogenomics, the study of how genetic variations influence drug response, represents a cornerstone of personalized medicine. By linking pharmacology with genomics, this emerging field enables clinicians to optimize drug therapy based on an individual's genetic profile, thereby reducing adverse drug reactions and improving therapeutic efficacy. Globally, pharmacogenomics has revolutionized treatment in oncology, psychiatry, and cardiology, but its application in India is still at an early stage. With a population of over 1.4 billion and rich genetic diversity, India faces both opportunities and challenges in implementing pharmacogenomics. The prevalence of adverse drug reactions, variable drug responses, and the high burden of non-communicable diseases underscore the urgent need for genetically guided therapies. Recent advances in next-generation sequencing, bioinformatics, and biobanking initiatives in India provide a foundation for integrating pharmacogenomics into clinical practice. However, barriers such as high costs, lack of standardized guidelines, limited awareness among healthcare providers, and ethical concerns must be addressed. Moving forward, India requires collaborative research, government support, and capacity-building initiatives to harness the full potential of pharmacogenomics. This integration will mark a paradigm shift towards safe, effective, and personalized healthcare for the Indian population.

Keywords: Pharmacogenomics, Personalized Medicine, Genetic Variability, Drug Response, India

Regenerative Medicine: Stem Cell Therapies for Neurodegenerative Disorders

Bochupalli Mythri[1*], Shaik Shakir Basha[2]

*[1]Department of Pharmacy, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India,

[2]Associate Professor, Department of Pharmaceutical Analysis, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India

Corresponding author: gollamythri0@gmail.com

Abstract

Neurodegenerative disorders such as Alzheimer's disease, Parkinson's disease, and amyotrophic lateral sclerosis represent a major global health challenge, with limited treatment options that primarily manage symptoms rather than provide a cure**.** Regenerative medicine, particularly stem cell therapy, offers a promising approach to restore neuronal function and slow or reverse disease progression. Stem cells possess the unique ability to self-renew and differentiate into multiple neural cell types, thereby enabling replacement of damaged neurons, modulation of neuroinflammation, and secretion of neurotrophic factors. Various stem cell sources including embryonic stem cells, induced pluripotent stem cells (iPSCs), and mesenchymal stem cells are being explored for their therapeutic potential in neurodegenerative conditions. Preclinical studies and early-phase clinical trials have demonstrated encouraging outcomes, such as improved motor function, reduced neuronal loss, and enhanced synaptic connectivity. Despite these advancements, challenges remain in ensuring long-term safety, ethical acceptance, immune compatibility, and large-scale clinical translation. With rapid progress in stem cell engineering, biomaterials, and gene editing technologies, stem cell therapy is poised to become a transformative modality in neuroregenerative medicine. This approach holds promise for shifting the paradigm from symptomatic management to disease modification and potential cure.

Keywords: Regenerative Medicine, Stem Cells, Neurodegenerative Disorders, Neuronal Repair, Cell Therapy.

Formulation And Evaluation of Polyherbal Microsponge Gel

Neha Singh*, Ashish Jain

Lakshmi Narain College of Technology (LNCT), Bhopal (M.P.)

Corresponding author: neha945040@gmail.com

Abstract

Polyherbal microsponges are polymeric exemption systems. These are small spongy -like spheres with large pores and can alter the release of drug, enhance stability, reduce side effects with poly herbs and enable to medicine release. The Microsponge system are grounded on teeny, polymeric microspheres that can suspend or entrap a wide variety of substances and can also be incorporated into formulated product similar as a gel, cream, liquid, powder and have recently been used for oral administration that is why it is called "multifaceted drug delivery system. Microsponge technology has favorable characteristics, which make it a protean medicine exemption agent.the external face is generally previous, allowing a sustained inflow of substances out of the sphere. Polyherbal microsponge are aimed to deliver a pharmaceutical active component efficiently at the minimum cure and also improve stability, enhance elegance and enhanced formulation flexibility at the minimum dose. The present review elaborates about the multifaceted polyherbal micropsponge technology including its preparation, characterization, evaluation methods along with recent research and future potential.

Keywords: Polyherbal microsponge, exemption, multifaceted, teeny, pharmaceutical active component.

Patient Counselling on Alzheimer's Disease

Prajakta Purohit*

NIMS Institute of Pharmacy

Corresponding author: prajaktapurohit1033@gmail.com

Abstract

Alzheimer's disease (AD) is a progressive neurodegenerative disorder that primarily affects memory, thinking, behaviour, and the ability to perform everyday activities. It is the most common cause of dementia, accounting for 60–80% of cases worldwide. With the global ageing population, the prevalence of AD is increasing rapidly, creating a substantial burden on patients, caregivers, and healthcare systems. As the disease advances, individuals experience significant cognitive decline, emotional distress, personality changes, and a loss of independence. In such a scenario, patient counselling plays a pivotal role in improving the quality of life for both patients and their caregivers. Effective counselling can help patients understand the nature of their disease, manage symptoms, cope with emotional challenges, and make informed decisions about their treatment and care. Moreover, counselling in Alzheimer's disease is not limited to the patient alone. Caregivers often face significant emotional, physical, and financial stress, and their needs must be addressed as part of the counselling process. Healthcare professionals, especially pharmacists and clinicians, can act as counsellors by providing personalised guidance, support, and education tailored to the patient's stage of disease progression. Despite its importance, patient counselling in Alzheimer's disease remains an under-researched and under-implemented area of care. This synopsis aims to explore the scope, methods, and benefits of structured counselling interventions in Alzheimer's disease management. Alzheimer's disease presents multifaceted challenges that go beyond cognitive impairment. While medical treatment is important, it is insufficient on its own. Patient counselling when delivered effectively can empower patients, relieve caregiver burden, and enhance the overall quality of care. This study aims to bridge the existing gaps by providing a comprehensive, evidence-based counselling framework that can be practically implemented in clinical and community settings. By recognizing and strengthening the role of patient counselling in Alzheimer's disease, healthcare systems can move toward more holistic, compassionate, and effective dementia care.

Keywords: Alzheimer's disease (AD), neurodegenerative, caregivers, dementia care.

Revolutionizing Topical Therapy: Nanosponge-Based Drug Delivery for Atopic Dermatitis

Rakesh Kumar[1], Shrestha Sharma[1], Syed Arman Rabbani[2]

[1]Amity Institute of Pharmacy, Amity University, Gurugram, Haryana-122412

[2]RAK Medical and Health University, Ras Al Khaimah, United Arab Emirates-11172

Corresponding author: rakeshk.bhardwaj98@gmail.com

Abstract

Atopic dermatitis (AD) is a chronic, relapsing skin disorder driven by barrier dysfunction, immune dysregulation, and microbial imbalance. Current management relies on topical corticosteroids, calcineurin inhibitors, and emollients; however, conventional creams and ointments often suffer from poor solubility, inadequate penetration, rapid degradation, and frequent dosing, leading to limited efficacy and poor patient compliance. These challenges have accelerated the shift toward nanotechnology-enabled delivery systems. Nanosponges—porous, sponge-like colloidal carriers offer controlled release, improved drug stability, and targeted deposition within skin layers, thereby reducing systemic exposure and irritation while sustaining therapeutic action. Their ability to encapsulate both hydrophilic and lipophilic agents enables versatility across diverse treatments. Preclinical evidence demonstrates that nanosponge formulations of corticosteroids, calcineurin inhibitors, and natural bioactives achieve superior permeation, prolonged retention, reduced flare-ups, and better tolerability compared with conventional topical formulations. Thus, nanosponge-based platforms represent a promising next-generation approach to advance AD therapy, uniting precision, safety, and long-term disease control.

Keywords: Atopic dermatitis; Skin barrier dysfunction, Nanosponges, Topical drug delivery, Controlled release, Corticosteroids, Calcineurin inhibitors, Patient compliance.

To develop and evaluate herbal transdermal patches with antifungal properties for effective and sustained treatment of fungal infections

Sachin J. Semwal*

Research Scholar, Department of Pharmaceutics, Kharvel Subharti College of Pharmacy, Meerut, Uttar Pradesh, India

Corresponding author: sem.wal2099@gmail.com

Abstract

Fungal infections, or mycoses, range from superficial conditions to life-threatening invasive diseases and are increasingly recognized as a major global health concern. Their prevalence has risen due to expanding immunocompromised populations, comorbidities such as diabetes and HIV/AIDS, and medical interventions that create susceptible hosts. Despite their growing impact, fungal diseases remain underdiagnosed and underprioritized, particularly in resource-limited settings. These infections can be broadly classified as superficial, cutaneous, subcutaneous, mucosal, or systemic, with dermatophytes, Candida, Aspergillus, and other opportunistic fungi being significant pathogens. Traditional antifungal therapies often face limitations such as resistance, systemic toxicity, and poor patient compliance, underscoring the need for alternative strategies. Transdermal drug delivery systems (TDDS) have emerged as a promising approach, offering advantages like sustained release, localized effects, improved compliance, and bypassing hepatic metabolism. Transdermal patches provide non-invasive, controlled drug delivery, while novel formulations improve skin penetration and therapeutic outcomes. Herbal antifungal agents such as neem, turmeric, garlic, tea tree oil, coconut oil, and Cinnamomum camphora demonstrate potent antifungal mechanisms, enhanced further through incorporation in transdermal systems. Preparation methods such as solvent casting and the use of biocompatible polymers, permeation enhancers, and plasticizers have been optimized to ensure patch stability, drug content uniformity, and efficacy. Evaluation techniques including UV-Vis, HPLC, FTIR, in vitro release, antifungal assays, ex vivo permeation, and skin irritation tests confirm therapeutic potential. Stability studies further ensure long-term effectiveness. Collectively, integrating herbal antifungal agents into advanced TDDS represents a significant advancement in the management of fungal infections.

Keywords: Fungal infections, Transdermal drug delivery, Herbal antifungal agents, Transdermal patches, Drug release evaluation.

Dried Saliva Spot: A Sampling Technique for Therapeutic Drug Monitoring and Disease Diagnosis

Ashwin Mudgal*

KIET Group of Institutions

Corresponding author: ashwin.2226bph1053@kiet.edu

Abstract

The dried Saliva Spot (DSS) sampling technique is a non-invasive and painless sample collection technique of bioanalysis for disease diagnosis and therapeutic drug monitoring. DSS sampling technique is widely used as an alternative technique when compared with traditional sampling techniques, dried blood spot (DBS), and dried matrix spot (DMS) because of advantages such as less tissue damage, less sampling quantity, and convenience. This technique's required sample volume is approximately 3-100 µL. This sample is applied on filter paper, then dried at room temperature for approximately 30 min. After drying, the dried saliva spot is extracted using a suitable solvent by vortex-assisted extraction or by ultrasound-assisted extraction. In DSS, the determination of biomarkers for disease diagnosis and therapeutic drug monitoring by using chromatographic and spectroscopic techniques or hyphenated techniques. In this paper, we discuss some applications of DSS, where dried saliva spot is used for disease diagnosis and therapeutic drug monitoring like the diagnosis of oral squamous cell carcinoma, D, L-Lactic acid/ diabetes, measles virus, hyperuricemia/uric acid and therapeutic drug monitoring of antipsychotics drugs, non-steroidal anti-inflammatory drugs, anti-epileptic drugs, and lidocaine.

Keywords: Dried Saliva Spot, DSS, non-invasive sampling, therapeutic drug monitoring, disease diagnosis, biomarkers, saliva analysis, chromatography, bioanalysis.

Herbal Niosomes as Targeted Drug Delivery System

Nisha Jha* Prashant Kumar

Accurate College of Pharmacy, Greater Noida, U.P

Corresponding author: nishajha201122@gmail.com

Abstract

Introduction: Niosomes are one of the best among these carriers. The self- assembly of non- ionic surfactants into vehicles was first reported in the 70s by researcher in the cosmetic industry. Niosomes (non-ionic surfactants vesicles) obtained on hydration are microscopic lamellar structure formed upon combining non-ionic surfactants of alkyl or dialkyl polyglycerol ether classes with cholesterol.

Objective: The objective of this study is to review the herbal niosomes. Niosomes, considered as novel drug delivery systems, can improve the solubility and stability of natural pharmaceutical molecules.

Method for Preparation of Niosomes: Multiple methods have been described in the literature for the preparation of niosomes. These include the thin-film hydration method, the ether injection method, the reverse-phase evaporation method, the transmembrane pH gradient drug uptake process, bubble method, and the micro-microfluidization method. Each method could result in the formation of niisomes of different sizes and size distribution. A brief overview of some of the methods that have been described for the preparation of niosomes is provided.

Conclusion: To enhance therapeutic effects and bioavailability, an enormous number of attempts have been made with regards to the development of a drug delivery system based on herbal C their phytoconstituent with niosomes.

Keywords: Niosomes, non-ionic surfactants, herbal niosomes, Bilayer, drug entrapment, lamellar.

Challenges Faced During HPV Vaccination in India

Om Kumar, Pawan Kumar, Dr. Rahul Kumar

Nims institute of pharmacy, Nims University Rajasthan, Jaipur

Corresponding author: kumarom1804@gmail.com

Abstract

Human papillomavirus (HPV) infection is the primary cause of cervical cancer, which continues to be a major public health concern in India. Despite the availability of safe and effective vaccines, their large-scale implementation has faced numerous hurdles, limiting the overall impact of vaccination programs.

Key barriers include low public awareness, inadequate health education, and stigma surrounding sexually transmitted infections. Economic constraints, high vaccine costs, and disparities in access between urban and rural regions further restrict adoption. Logistical issues, such as gaps in cold chain maintenance, limited integration into national immunization schedules, and insufficient coverage in school-based programs, also weaken outreach efforts.

Moreover, myths, misconceptions, and vaccine hesitancy fueled by cultural beliefs and misinformation remain significant challenges. This review critically explores these socio-cultural, economic, and infrastructural barriers while also examining government initiatives, recent policy reforms, and the potential of indigenous vaccines. Strengthening awareness campaigns, reducing costs, and improving program delivery are crucial steps toward expanding coverage, lowering cervical cancer incidence, and securing long-term public health gains in India.

Keywords: Human papillomavirus (HPV)**,** Cervical cancer prevention**,** Vaccine hesitancy**,** public health in India**,** Immunization challenges.

Artificial Intelligence in Early Disease Diagnosis

Sandhya Baranwal*, Dr. Sunil Kumar Singh

Department of Pharmacology, United Institutes of Pharmacy, Prayagraj, 211010 India.

Corresponding author: sandhyabaranwal5@gmail.com

Abstract

Since it has a direct impact on patient outcomes, treatment efficacy, and healthcare expenses, early and accurate disease identification continues to be one of the most important difficulties in contemporary healthcare. A game-changing technology for improving diagnostic speed and accuracy is artificial intelligence (AI), especially machine learning and deep learning approaches. Large and complicated biomedical datasets, such as genomic profiles, medical imaging, and electronic health records, can be analysed by AI-driven models to find tiny trends that may be hard for physicians to see. Recent developments have shown how AI can be used to detect chronic diseases including diabetes, cancer, cardiovascular disease, and neurodegenerative disorders early on. AI not only helps medical professionals make decisions, but it also minimizes diagnostic delays, lowers human error, and makes tailored treatment plans possible by combining predictive algorithms with clinical operations. Additionally, wearable technology driven by AI and remote monitoring tools offer chances for ongoing health monitoring and preventative care. Notwithstanding these developments, issues with clinical validation, algorithm openness, and data privacy still exist. For AI to be integrated into healthcare systems in a way that is both safe and moral, these restrictions must be addressed. All things considered, AI signifies a paradigm shift in 21st-century disease management toward proactive, patient-centred, and technology-driven approaches.

Keywords: Artificial Intelligence, Early Diagnosis, Machine Learning, Healthcare Technology, Predictive Analytics, Personalized Medicine.

Molecular Docking-Based Insights into 7-Hydroxycoumarin Derivatives as Potential Anti-Inflammatory Agents

Saurabh Singh*, Surendra Jatav

School of Medical and Allied Sciences, Galgotias University

Corresponding author: saurabhkdkvm102018@gmail.com

Abstract

Inflammation is a protective response of the body against harmful stimuli, aiming to restore normal tissue function. Cyclooxygenase-2 (COX-2) is a key enzyme involved in the biosynthesis of prostaglandins, which regulate pain, fever, and inflammation. Selective inhibition of COX-2 has long been recognized as a promising therapeutic strategy. In this study, a novel series of 7-hydroxycoumarin derivatives was designed and computationally evaluated using molecular docking against the COX-2 crystal structure (PDB ID: 1CX2). Aspirin was employed as a reference compound to validate binding interactions and docking protocols. The results demonstrated that all synthesized derivatives exhibited stronger binding affinities than aspirin (–6.4 kcal/mol). Among them, compounds A, B, and C showed significant docking scores of –7.9, –8.8, and –8.8 kcal/mol, suggesting enhanced inhibitory potential. Most notably, compound D displayed the highest docking score (–9.9 kcal/mol), attributed to additional hydrogen bonding and hydrophobic interactions within the COX-2 active site. These findings suggest that 7-hydroxycoumarin derivatives represent promising scaffolds for the development of potent COX-2-selective anti-inflammatory agents.

Keywords: 7-hydroxycoumarin, cyclooxygenase inhibition, molecular docking, anti-inflammatory agents.

Formulation And Evaluation of Novel Topical Cream Containing Luliconazole Co-Crystals

Saurabh Nautiyal*, Ram Prasad, Deepanshu Rana, C. Nithya Shanti

School of Pharmaceutical Sciences and Technology, Sardar Bhagwan Singh University, Balawala, Dehradun-248001, Uttarakhand, India

Corresponding author: nautiyalsaurabh93@gmail.com

Abstract

The development of advanced topical formulations is essential to address limitations of conventional antifungal therapies, such as poor solubility and inadequate skin penetration. *Luliconazole*, a potent imidazole antifungal agent, is highly effective against dermatophytes but exhibits restricted solubility and potential skin irritation. This study focuses on the formulation and evaluation of a novel topical cream containing *Luliconazole–Metronidazole* co-crystals. Co-crystallization was employed as a strategy to improve solubility, stability, and therapeutic efficiency, while harnessing the synergistic benefits of antifungal and antibacterial activity. Metronidazole was incorporated to enhance solubility, provide antibacterial protection, and support broader therapeutic coverage. The formulated cream was systematically evaluated for physicochemical parameters, including appearance, pH, viscosity, spreadability, and drug content. Structural confirmation of co-crystal formation and stability was performed using FTIR, DSC, and XRD analyses. *In vitro* and *in vivo* studies revealed improved permeation, skin retention, and therapeutic effectiveness compared to conventional topical formulations. The optimized cream demonstrated enhanced antifungal efficacy, additional antibacterial activity, and better patient compliance potential. This research highlights the promise of Luliconazole–Metronidazole co-crystals as a novel topical therapeutic approach for managing dermatological infections, providing improved drug delivery and synergistic clinical benefits.

Keywords: Luliconazole, Metronidazole, Co-crystals, Topical cream, Antifungal therapy.

Regenerative Medicine and Stem Cell Therapies: Bridging the Gap Between Science and Clinical Applications

S Shakir Basha[1]*, S Pavan Kalyan[1], S Sreenivas[2]

[1]Department of Pharmaceutical Analysis, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India,

[2] Department of Pharmacy, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India.

Corresponding author: shakirbasha72@gmail.com

Abstract

Regenerative medicine, encompassing stem cell therapies, tissue engineering, and biomaterials, represents a paradigm shift in modern healthcare by aiming to restore or replace damaged tissues and organs. Stem cells, owing to their self-renewal and differentiation capacities, have emerged as pivotal tools in treating degenerative diseases, injuries, and genetic disorders. Recent advancements in induced pluripotent stem cells (iPSCs), mesenchymal stem cells (MSCs), and organoid technology have significantly enhanced the translational potential of regenerative therapies. Despite remarkable preclinical progress, clinical implementation faces challenges such as immunogenicity, ethical considerations, scalability, and regulatory hurdles. Innovations in biomaterial scaffolds, gene editing, and 3D bioprinting are bridging the gap between laboratory research and patient-centered applications, offering personalized and precision-based treatment strategies. Ongoing clinical trials highlight promising outcomes in cardiovascular, neurological, musculoskeletal, and ocular disorders. This review provides a comprehensive overview of the current landscape, elucidating recent scientific breakthroughs, clinical successes, and the hurdles that remain in translating regenerative medicine from bench to bedside. A multidisciplinary approach integrating stem cell biology, bioengineering, and clinical sciences is essential to realize the full therapeutic potential of regenerative medicine.

Keywords: Regenerative medicine, Stem cells, Tissue engineering, iPSCs, MSCs, Clinical translation, 3D bioprinting.

Advancement of Liposomal Nanomedicine in Precision Cancer

Shouraj Kumar*, Dr. Himmat Singh Chawda

Nims institute of pharmacy, Nims university Rajasthan, Jaipur

Corresponding author: saurya663@gmail.com

Abstract

Lysosomes, once considered simple degradative organelles, are now recognized as central regulators of metabolism, signalling, and programmed cell death. Their dysfunction plays a critical role in cancer progression and therapeutic resistance, making them attractive targets for precision oncology. Recent advances in nanomedicine have enabled the design of lysosome-targeted nanosystems that exploit the acidic pH, enzyme-rich environment, and altered trafficking of tumor lysosomes to achieve precise drug release and enhanced therapeutic efficacy. Smart nanoplatforms, including pH-responsive nanoparticles, enzyme-activated carriers, and ligand-functionalized systems, not only improve drug accumulation but also overcome multidrug resistance, reprogram tumor metabolism, and synergize with existing and emerging anticancer strategies.

Importantly, lysosomal nanomedicine reduces systemic toxicity by minimizing off-target exposure, thereby improving safety and expanding the therapeutic index. This review highlights recent innovations, preclinical progress, and emerging clinical applications of lysosome-directed nanomedicine, while also addressing key challenges such as tumor heterogeneity, immune compatibility, and large-scale production. By bridging nanotechnology with lysosomal biology, lysosomal nanomedicine holds significant promise to transform precision cancer therapy and establish new paradigms in personalized oncology.

Keywords: Lysosomal nanomedicine**,** Precision oncology**,** Targeted drug delivery**,** Multidrug resistance**,** Tumour microenvironment.

Formulation And Development of Pazopanib-Loaded Nanostructured Lipid Carriers for Targeted Cancer Therapy

Vinayak Kachru Mhaismale

Y.B.Chavan College of Pharmacy, Chh. Sambhajinagar

Corresponding author: vinayakmhaismale@gmail.com

Abstract

Pazopanib, a potent tyrosine kinase inhibitor, is widely employed in the treatment of advanced renal cell carcinoma and soft tissue sarcomas. However, its poor aqueous solubility, limited oral bioavailability, and variable pharmacokinetics restrict therapeutic efficiency. To overcome these limitations, nanostructured lipid carriers (NLCs) offer a promising drug delivery approach. NLCs are second-generation lipid nanoparticles composed of solid and liquid lipids stabilized by surfactants, providing improved drug loading, stability, and controlled release. In this work, Pazopanib was encapsulated into NLCs to enhance solubility, bioavailability, and sustained therapeutic effect. The NLCs were prepared using high-shear homogenization and ultrasonication techniques, followed by characterization for particle size, polydispersity index, zeta potential, entrapment efficiency, and morphology. Optimized formulations exhibited nanometric particle size (<200 nm), narrow size distribution, high encapsulation efficiency, and stable surface charge, ensuring physical stability. In vitro drug release studies demonstrated biphasic release with an initial burst followed by sustained release, potentially reducing dosing frequency. Overall, Pazopanib-loaded NLCs present a viable strategy to overcome solubility challenges, improve patient compliance, and maximize therapeutic efficacy in cancer treatment.

Keywords: Pazopanib, Nanostructured Lipid Carriers, Cancer Therapy, Targeted Delivery, Sustained Release.

Computational Evaluation of Natural Antimicrobials Targeting DNA Gyrase B: A Docking and ADMET Study

Vinita Nand*, Pinkal Patel

Department of Pharmaceutical Chemistry, Parul Institute of Pharmacy & Research, Parul University, Vadodara, Gujarat, 391760.

Corresponding author: Vinitabony@gmail.com

Abstract

Antimicrobial resistance has reduced the clinical utility of conventional antibiotics such as Novobiocin, which targets the ATP-binding pocket of DNA Gyrase B (Gyr B). In this study, natural phytoconstituents were evaluated as potential alternatives. Molecular docking revealed that Quercetin (-8.7 kcal/mol) and Kaempferol (-8.5 kcal/mol) displayed stronger binding affinities than Novobiocin (-7.6 kcal/mol), indicating more stable inhibition of Gyr B. Pharmacokinetic evaluation using the BOILED-Egg model showed that Novobiocin, with high polar surface area, has poor gastrointestinal absorption and no blood–brain barrier (BBB) penetration. In contrast, phytoconstituents exhibited favorable absorption profiles and, in some cases, predicted brain access, along with better drug-likeness. These results highlight the therapeutic promise of phytoconstituents as safer and more effective antimicrobial agents compared to Novobiocin.

Keywords: DNA Gyrase B, Novobiocin, Phytoconstituents, Quercetin, Kaempferol, Docking Score, Boiled-Egg Model, BBB penetration, antimicrobial resistance.

The Role of Artificial Intelligence in Revolutionizing Cancer Diagnostics and Treatment

Vishakha Goswami*
Lloyd Institute of Management and Technology (Pharm), AKTU, Greater Noida, UP

Corresponding author: vishakhagoswami2000@gmail.com

Abstract

Background: Cancer remains a leading cause of global mortality, where early detection and precise treatment are crucial for improving patient survival. Traditional diagnostic and therapeutic approaches, while foundational, are often limited by inter-observer variability and the complexity of genomic and clinical data. The integration of Artificial Intelligence (AI) has brought a paradigm shift in oncology by enabling faster, more accurate, and personalized care.

Aim: This poster explores the transformative applications of AI across the oncology continuum, from initial detection to personalized treatment strategies.

Methods: Recent clinical studies and reviews were examined to highlight AI-driven innovations. Special emphasis was given to deep learning algorithms, particularly Convolutional Neural Networks (CNNs) in imaging, and machine learning approaches in genomics, proteomics, and biomarker discovery. AI applications in therapy optimization, drug discovery, and clinical decision support were also reviewed.

Results: AI systems demonstrate high accuracy in detecting malignancies from CT scans, mammograms, and histopathological slides, often rivaling expert performance. In therapeutics, predictive models guide chemotherapy and immunotherapy responses, streamline radiotherapy planning, and accelerate drug development. AI also supports personalized treatment selection and improves patient monitoring.

Conclusion: AI is revolutionizing cancer diagnostics and treatment by enhancing accuracy, efficiency, and personalization, representing a powerful tool for the future of oncology.

Keywords: Artificial Intelligence, Cancer Diagnostics, Deep Learning, Personalized Medicine, Oncology.

Formulation And Evaluation of Gentamicin Sulphate-Based *in Situ* Gel

Yash Bhatt*, Nancy Thakur, C. Nithya Shanti

School of Pharmaceutical Sciences and Technology, Sardar Bhagwn Singh University, Balawala, Dehradun-248001, Uttarakhand, India

Corresponding author: yashndbhatt@gmail.com

Abstract

In situ gel are liquid dosage form that remain in solution form at room temperature and gets converted into gel form at physiological conditions (temperature, pH, enzymes and presence of ions. These formulations enhance the precorneal residence time which ultimately increases the bioavailability of drug. Deep eutectic solvents are the solvents that are composed of two or more components having melting point lower than that of its individual components. Gentamicin sulphate is a BCS class III drug having low permeability. In order to overcome its permeability problem this research aims to formulate and evaluate Gentamicin sulphate based *in situ* gel by cold method using Poloxamer 407 as a temperature polymer. Seven different formulations of in situ gel (IG1-IG7) were prepared by varying the concentration of Poloxamer 407 and evaluate for pH, gelation temperature, viscosity, in vivo drug release and *in vitro* permeation studies. The pH, gelation temperature and viscosity of the optimized formulation (IG6) was found to be 7.22, 36.66 ºC and 293.66cps at 50 rpm and 195.33cps at 100 rpm respectively. In the *in vitro* drug release study, the optimized formulation showed the cumulative amount of drug 23.700 mg at 24 hours. The *in vitro* permeation study shows the flux of 1.212 µg/cm^2 /hour at 6 hours.

Keywords: Gentamicin Sulphate, permeability, *in situ* gel, gelation temperature.

Computational Molecular docking studies of novel chromene derivatives as COX-2 Inhibitors

Manjot Singh*, Kalpana Rahate

School of Medical and Allied Sciences, Galgotias University

Corresponding author: msing6738@gmail.com

Abstract

Inflammation represents a protective immune mechanism against harmful stimuli, but when prolonged or dysregulated, it contributes to chronic diseases such as arthritis, cardiovascular disorders, and cancer. Non-steroidal anti-inflammatory drugs (NSAIDs), including ibuprofen, are effective in alleviating pain and inflammation but are associated with significant side effects upon long-term use, particularly gastrointestinal and cardiovascular risks. This has led to the exploration of safer alternatives with improved selectivity for cyclooxygenase-2 (COX-2), the inducible enzyme responsible for the production of pro-inflammatory prostaglandins. In this study, a novel series of ten chromene derivatives (A–J) were structurally characterized, and evaluated for their anti-inflammatory potential using in silico techniques. Molecular docking studies were performed with the COX-2 crystal structure (PDB ID: 3LN1) through computational platforms including ChemDraw 2D, 3D, Discovery Studio, PyRx, and AutoDock. Ibuprofen, used as the reference compound, exhibited a binding affinity (BA) of 7.7. Interestingly, four derivatives (A–D) demonstrated stronger binding affinities, with docking scores of 10.7, 9.7, 9.7, and 8.4, respectively, along with stable interactions at the active site. These results suggest that chromene derivatives A–D may function as potent COX-2 selective inhibitors and serve as promising leads for further pharmacological investigation toward the development of safer anti-inflammatory agents.

Keywords: Anti-inflammatory agents, Molecular docking, Ibuprofen, Binding affinity, Drug design.

Examining the role of inflammation in a zebrafish model of sensory hair cell aging

Kunal*

Gurukul Kangri (Deemed to be University), Haridwar, Uttarakhand

Corresponding Author: kunal7419028442@gmail.com

Abstract

In the zebrafish model, inflammation plays a complex, bidirectional role in cell aging, promoting it by triggering senescence-associated secretory phenotype (SASP) and chronic inflammatory pathways like NF-κB signaling in beta-cells, which reduces cell proliferation and function. Concurrently, zebrafish models are used to study the inflammatory components of age-related decline and to screen for compounds that can suppress inflammation and alleviate aging processes, leveraging their genetic similarity to humans and transparent embryos for in-depth cellular analysis.

Keywords: Zebrafish model, inflammation, aging, senescence-associated secretory phenotype, beta-cell dysfunction.

Examining the role of inflammation in a zebrafish model of sensory hair cell aging

Geetika Goel*[1], Jannat ul Firdaus[2]

[1*]PhD Scholar, School of Pharmacy, Sharda University, Greater Noida

[2]Assistant Professor, School of Pharmacy, Sharda University, Greater Noida

Corresponding Author: Geetikagoel89@gmail.com

Abstract

Antiepileptic medications, or AEDs, are being used more often to treat a variety of neurological and mental diseases that are not epileptic. The majority of AEDs have several mechanisms of action (MOAs), which include changes to voltage-gated ion channels or intracellular signalling pathways, as well as modulation of glutamatergic and c-aminobutyric acid (GABA)ergic neurotransmission. Antiepileptic medications that block sodium channels may lessen ectopic discharge from damaged dorsal root ganglion neurons and nerve terminals.

These MOAs may explain the effectiveness of AEDs in treating bipolar illness and neuropathic pain. For bipolar illness, migraine prevention, chronic pain, and fibromyalgia, conventional medication has generally proven ineffective and constrained by drug-related toxicity.

By interacting with particular neurotransmitters and ion channels, these medications alter the transmission of pain. Neuropathic and non-neuropathic pain are treated differently by antidepressants and antiepileptic medications, and each form of treatment has a different level of effectiveness; for example, antifungal, antioxidant, anti-inflammatory, and antibacterial effects give them therapeutic versatility outside of treating epilepsy. In order to provide insights for future research and therapeutic applications, this review produces existing knowledge, highlighting the many roles in biological systems and their potential as anti-epileptic drugs and other pharmacological actions.

Keywords: Bipolar illness, neuropathic pain, biological activities, epilepsy, antifungal, antioxidant, anti-inflammatory, antimicrobial, migraine, neuroprotection, seizure, anti-epileptic agent.

Emulsomes mediated targeted delivery of paclitaxel for the treatment of glioblastoma

Murad Ali[1], Suryakant Verma[1*], Mohit Panwar[1], Sachin Tyagi[1]

[1]Bharat Institute of Technology, School of Pharmacy, NH-58, Partapur Bypass Road,

Meerut-250103, Uttar Pradesh

Corresponding Author: surajmeerut@gmail.com

Abstract

Glioblastoma is one of the most aggressive brain tumors with poor survival rates. Current treatments like surgery, radiation, and chemotherapy are often limited due to rapid tumor growth, drug resistance, and serious side effects. Paclitaxel is a powerful anticancer drug, but its low solubility and inability to cross the blood–brain barrier restrict its use in glioblastoma therapy. To overcome these challenges, emulsomes, a lipid-based nanocarrier system, were developed for targeted delivery of paclitaxel. Paclitaxel-loaded emulsomes were prepared using the thin-film hydration technique followed by sonication. The formulation was evaluated for particle size, stability, drug entrapment efficiency, and release behaviour. In vitro studies were conducted to test cytotoxicity against glioblastoma cells and to compare the effectiveness of emulsome-based delivery with free paclitaxel. The prepared emulsomes showed nanosized particles with high drug loading and good physical stability. Drug release was found to be controlled and sustained, ensuring prolonged exposure of the tumor to paclitaxel. In vitro results demonstrated higher cytotoxicity of emulsome-loaded paclitaxel against glioblastoma cells compared to the free drug, suggesting improved drug uptake and action. Emulsomes offer a promising delivery platform for paclitaxel in glioblastoma treatment. By enhancing solubility, prolonging release, and improving cellular uptake, this system can increase therapeutic effectiveness while reducing side effects. Further in vivo and clinical studies are required to confirm its potential in real-world treatment of glioblastoma.

Keywords: Glioblastoma, paclitaxel, emulsomes, targeted delivery, blood–brain barrier, nanomedicine.

The development of TPGS-BSAED liposomal formulation to combat antimicrobial resistance

Mohd. Salman[1], Suryakant Verma[1*], Charu Bharti[1], Ishita Tyagi[1], Sachin Tyagi[1]

[1]Bharat Institute of Technology, School of Pharmacy, NH-58, Partapur Bypass Road,

Meerut-250103, Uttar Pradesh

Corresponding Author: surajmeerut@gmail.com

Abstract

Antimicrobial resistance (AMR) is a serious global health challenge where antibiotics become less effective, making infections harder to treat. To address this issue, new drug delivery systems are needed that can improve the effectiveness of medicines and reduce resistance. Liposomes, which are small vesicles that carry drugs, are one promising approach. In this study, a TPGS-BSAED liposomal formulation was developed. TPGS (D-α-tocopheryl polyethylene glycol succinate) is a safe excipient that increases drug solubility and helps block resistance mechanisms such as efflux pumps. BSAED was used as a stabilizer to make the formulation more stable. Liposomes were prepared using the thin-film hydration method and evaluated for particle size, stability, drug loading efficiency, and release pattern. The prepared formulation showed nanosized particles with high drug loading and good stability. Drug release studies demonstrated a slow and controlled release pattern, allowing longer therapeutic action. In vitro antimicrobial tests showed that the formulation had stronger activity against resistant bacteria compared to the free drug. The TPGS-BSAED liposomal system is a promising strategy to fight AMR. It can improve drug effectiveness, reduce side effects, and provide sustained action. Further in vivo and clinical studies are needed to confirm its practical application in treating resistant infections.

Keywords: Antimicrobial resistance, TPGS, Liposomal formulation, Nanotechnology, Drug delivery.

In-vitro evaluation and development of formulation based on polyherbal extract for the treatment of diabetes mellitus

Suryakant Verma[1,2,*], Milind Sharad Pande[1]

[1]Department of Pharmaceutics, IIMT College of Medical Sciences, IIMT University, Meerut, Uttar Pradesh, 250001, India

[2]Department of Pharmaceutics, School of Pharmacy, Bharat Institute of Technology, NH-58, Partapur Bypass, Meerut, Uttar Pradesh, 250103, India

Corresponding Author: surajmeerut@gmail.com

Abstract

Worldwide, polyherbal drugs have been extensively used for long-term diabetic treatment because they contain glycosides, flavonoids, alkaloid compounds, and various other substances with specific types of activity. The present study aims to develop a suitable tablet dosage form for a polyherbal combination of ten herbs with potent antidiabetic properties. The tablet is prepared by mixing polyherbal drugs, namely *Gymnema sylvestre*, *Syzygium cumini*, *Pterocarpus marsupium*, *Psidium guajava*, *Mangifera indica*, *Costus igneus*, *Aloe barbadensis*, *Abelmoschus esculentus*, *Camellia sinensis*, and *Tinospora cordifolia*, along with excipients.The study focuses on obtaining standard raw materials, accurately collecting and authenticating plant ingredients, rigorously standardizing each component, optimizing tablet formulation, and evaluating antidiabetic potential using a streptozotocin-induced diabetes model in rats. For the manufactured polyherbal tablets, it was observed that the hardness, friability, and disintegration time were all found to fall within acceptable parameters. Analysis of the data showed that among the nine formulations tested (F1-F9), F3, F7, and F9 demonstrated the highest dissolution rates, reaching 97.54±0.47%, 93.21±1.50%, and 92.95±0.52%, respectively, at the end of the study. In vitro assessments identified formulation F7 as the most promising candidate. In summary, this research underscores the potential of polyherbal formulations in diabetes management. Optimized versions could be advanced for scale-up trials.

Keywords: Polyherbal, metabolic disease, synergistic, antidiabetic, tablet.

Formulation and evaluation of an anti-inflammatory herbal hydrogel containing *Ocimum sanctum* and *Indian frankincense*

Abhishek Rana[1], Suryakant Verma[1*], Charu Bharti[1], Ishita Tyagi[1], Sachin Tyagi[1]

[1]Department of Pharmaceutics, School of Pharmacy, Bharat Institute of Technology, NH-58, Partapur Bypass, Meerut, Uttar Pradesh, 250103, India

Corresponding Author: surajmeerut@gmail.com

Abstract

Development and assessment of a hydrogel formulation incorporating ocimum sanctum, Indian Frankincense (Boswellia Serrata) extracts for anti-inflammatory activity. A ethanolic fraction was produced by partitioning the ethanol, of O. sanctum leaf powder extract and Frankincense resin (Gum). In separate containers, 50 ml each of chloroform, n-hexane, ethyl acetate, and double distilled water were combined. For the hydrogel synthesis, different proportions of aloe and ocimum sanctum and Indian Frankincense (Boswellia Serrata) were mixed with different proportions of propylene, methyl paraben and Carbopol 940. The ideal physical characteristics, pH level, homogeneity, viscosity, release profile, medication content, and irritation potential of the produced hydrogel were determined through characterization. The protein/albumin denaturation bioassay will used to evaluate the anti-inflammatory impact of the optimized hydrogel. Because the rules established by the CPCSEA, which control the use of animals in drug research, necessitated this review. When there are viable alternatives to using animals, these rules demand a good reason for their use. Ethical concerns take precedence. Most proteins lose their biological activity when denaturation occurs. It is well-established that albumin denaturation causes inflammation.

Keywords: Transdermal, hydrogel, ocimum, boswellia serrata anti-inflammatory.

Enhancement of dissolution rates of poorly water-soluble drug with hydrophilic polymer

Hifza Ansari[1], Suryakant Verma[1*], Charu Bharti[1], Sachin Tyagi[1]

[1]Department of Pharmaceutics, School of Pharmacy, Bharat Institute of Technology, NH-58, Partapur Bypass, Meerut, Uttar Pradesh, 250103, India

Corresponding Author: surajmeerut@gmail.com

Abstract

This research aims to enhance the water solubility and improve the uptake of the antihypertensive drug Azilsartan Medoxomil by using a solid dispersion technique with kneading. The goal was to create an amorphous solid dispersion by testing various hydrophilic polymers to find the optimal carrier. We prepared and evaluated solid dispersions at multiple drug-to-polymer ratios. The most effective polymer concentration was determined by its solubility and dissolution properties. All formulations showed improved solubility in a 0.1 M phosphate buffer (pH 6.8) compared to the pure drug. To determine the optimal formulation, we conducted drug content analysis, percentage yield, and in-vitro dissolution studies. The prepared solid dispersions were characterized using Fourier Transform Infrared (FTIR) spectroscopy, Powder X-ray Diffraction (PXRD), Differential Scanning Calorimetry (DSC), and Scanning Electron Microscopy (SEM). The DSC study revealed that while pure Azilsartan Medoxomil has a sharp endothermic peak at its melting point, the optimized formulation showed a slight decrease in this peak, indicating its amorphous nature. PXRD results confirmed this, showing a reduction in crystallinity and partial amorphization. FTIR studies found no major interaction between the drug and the carrier. SEM analysis showed that the optimized formulation had a decreased crystalline lattice structure, confirming its conversion to an amorphous form.

Furthermore, the accelerated stability tests demonstrated that the optimized preparation maintained its good physical and chemical stability over time. Overall, the results suggest that Poloxamer 407 is a highly effective carrier for improving the aqueous solubility and bioavailability of Azilsartan Medoxomil, and the solid dispersion approach with kneading is a promising method for enhancing drug delivery performance.

Keywords: Azilsartan medoxomil, PEG-6000, HPMC K L100, Poloxamer 407, FTIR, XRD, polymer.

Artificial intelligence in pharmacy: An overview of innovations

Mohd Fawaj[1], Sachin Tyagi[1]

[1]Department of Pharmaceutics, School of Pharmacy, Bharat Institute of Technology, NH-58, Partapur Bypass, Meerut, Uttar Pradesh, 250103, India

Corresponding Author: sachintyagi005@gmail.com

Abstract

Artificial Intelligence (AI) is transforming the pharmaceutical industry by driving innovation across the entire drug development and healthcare ecosystem. From early-stage drug discovery to personalized medicine, AI-powered tools are accelerating research, reducing costs, and improving clinical outcomes. Machine learning algorithms enable the rapid identification of drug targets, prediction of molecular interactions, and optimization of lead compounds, thereby shortening development timelines. In pharmacy practice, AI enhances medication management, supports clinical decision-making, and facilitates precision prescribing through the integration of electronic health records and predictive analytics. AI-driven virtual screening, natural language processing, and deep learning models are also revolutionizing pharmacovigilance, enabling real-time detection of adverse drug reactions and enhancing patient safety. Furthermore, AI applications in supply chain optimization, manufacturing, and patient engagement contribute to efficiency and better therapeutic outcomes. Despite these advancements, challenges such as data privacy, algorithmic bias, regulatory considerations, and integration with existing systems remain critical barriers. This overview highlights the transformative role of AI in pharmacy, emphasizing its potential to redefine pharmaceutical research, practice, and healthcare delivery while addressing the need for responsible and ethical implementation.

Keywords: Artificial intelligence, drug discovery, personalized medicine, pharmacovigilance, machine learning, clinical decision support, pharmaceutical innovation.

Effectiveness of ChatGPT in clinical pharmacy and role of artificial intelligence in medication therapy management

Abdus Samad[1], Sachin Tyagi[1]

[1]Department of Pharmaceutics, School of Pharmacy, Bharat Institute of Technology, NH-58, Partapur Bypass, Meerut, Uttar Pradesh, 250103, India

Corresponding Author: sachintyagi005@gmail.com

Abstract

Artificial intelligence (AI) has emerged as a transformative tool in healthcare, with ChatGPT being one of the most widely discussed applications for clinical decision support. In clinical pharmacy, effective communication, accurate drug information, and patient-centered counseling are critical for improving health outcomes. ChatGPT demonstrates potential effectiveness by assisting pharmacists in rapidly retrieving drug-related information, identifying potential drug–drug interactions, and providing evidence-based recommendations. Its natural language processing capabilities enable real-time patient counseling, personalized education, and enhanced clinical documentation. Moreover, ChatGPT supports pharmacists in handling routine queries, allowing more time for complex clinical interventions. Within medication therapy management (MTM), AI facilitates medication reconciliation, adherence monitoring, and therapeutic optimization by analyzing large datasets and predicting patient-specific risks. While promising, challenges such as data privacy, contextual accuracy, and the need for human oversight remain essential considerations. Overall, ChatGPT and AI-driven solutions complement pharmacists' expertise, streamline workflow efficiency, and enhance patient safety. As integration into healthcare systems advances, responsible adoption and continuous validation will be crucial to maximize benefits while mitigating limitations. This paradigm highlights the evolving role of AI in clinical pharmacy and underscores its potential in optimizing medication therapy management.

Keywords: ChatGPT, clinical pharmacy, artificial intelligence, medication therapy management, drug interactions, patient counseling, digital health.

The use of quality control parameters in the evaluation of herbal drugs

Firdous Fatima[1], Suryakant Verma[1*], Sachin Tyagi[1]

[1]Department of Pharmaceutics, School of Pharmacy, Bharat Institute of Technology, NH-58, Partapur Bypass, Meerut, Uttar Pradesh, 250103, India

Corresponding Author: surajmeerut@gmail.com

Abstract

Herbal drugs, derived from plant sources, play a vital role in traditional and modern healthcare systems worldwide. However, their therapeutic effectiveness and safety largely depend on rigorous quality evaluation. Unlike synthetic drugs, herbal formulations often consist of complex mixtures of bioactive compounds, making standardization and quality control challenging. The application of quality control parameters such as macroscopic and microscopic evaluation, physicochemical analysis, phytochemical screening, and chromatographic fingerprinting ensures the identity, purity, and consistency of herbal drugs. Physicochemical parameters including ash values, extractive values, loss on drying, and pH provide essential insights into the composition and stability of crude drugs. Chromatographic techniques like TLC, HPTLC, and HPLC are widely used for chemical profiling and detection of adulterants. Additionally, pharmacognostic studies help in authenticating the raw materials and distinguishing genuine drugs from substitutes or spurious ones. Adherence to pharmacopeial standards and guidelines established by WHO and other regulatory authorities further strengthens the credibility of herbal medicines in global markets. Hence, systematic evaluation using standardized quality control parameters is indispensable for ensuring the efficacy, safety, and acceptance of herbal drugs in evidence-based medicine.

Keywords: Herbal drugs, quality control, pharmacognosy, chromatographic fingerprinting, physicochemical parameters, standardization, phytochemical screening.

Polyherbal formulation for skin disease

Shilpa Thukral[1]*, Dr. Bharat Tekade[2]

[1]HOD, Dnyan Ganga Institute of Pharmaceutical Sciences, Thane (W)

[2]Principal, Dnyan Ganga College of Pharmacy, Thane (W)

Corresponding Author: shilpaailwadi29@gmail.com

Abstract

Skin diseases are among the most common health concerns worldwide, significantly affecting quality of life and leading to both physical discomfort and psychosocial stress. Conventional therapies, although effective, are often associated with side effects, resistance, and limited accessibility. Polyherbal formulations have emerged as a promising alternative approach, utilizing the synergistic action of multiple medicinal plants to enhance therapeutic efficacy and minimize adverse reactions. The rationale behind polyherbalism lies in combining herbs with complementary pharmacological activities that target various pathological factors such as inflammation, microbial infection, oxidative stress, and impaired wound healing. Several phytoconstituents, including flavonoids, alkaloids, terpenoids, and tannins, contribute to antimicrobial, anti-inflammatory, antioxidant, and skin-rejuvenating effects. Recent studies highlight the effectiveness of polyherbal formulations in treating common dermatological conditions such as eczema, psoriasis, acne, fungal infections, and wounds. Additionally, the use of traditional knowledge integrated with modern pharmacological validation strengthens the scientific basis for their clinical use. The development of standardized, safe, and effective polyherbal formulations can serve as a cost-effective and sustainable strategy for skin healthcare. Future research should focus on optimization, bioavailability enhancement, and rigorous clinical evaluation to establish their role as reliable dermatological therapeutics.

Keywords: Polyherbal formulation, skin disease, phytoconstituents, antioxidant, antimicrobial, anti-inflammatory, wound healing, traditional medicine.

Advances in Nanocarriers: A Step Toward Site-Specific Drug Delivery

Vivek Gautam*

Department of Pharmaceutics

L. B. Rao Institute of Pharmaceutical Education and Research, Khambhat, Anand, Gujarat

Corresponding author: Vivekgautam681@gmail.com

Abstract

Nanocarriers have emerged as promising solutions for overcoming the constraints of traditional drug administration, such as low solubility, quick clearance, and non-specific distribution. Systems such as liposomes, Aquasomes, and dendrimers improve treatment results by allowing for targeted, regulated, and efficient drug release. Liposomes encapsulate hydrophilic and lipophilic medicines with great biocompatibility, whereas Aquasomes preserve delicate biomolecules and allow long-term release. Dendrimers' branching design enables precise drug loading and functionalization for active targeting. These nanocarriers have demonstrated promising results in cancer treatment, neurological diseases, gene delivery, and immunization. However, large-scale production, regulatory barriers, and long-term safety remain issues. This poster reviews recent breakthroughs in nanocarrier design, emphasizing its importance in attaining site-specific medication delivery and precision medicine.

Keywords: Nanocarriers, Liposomes, Aquasomes, Dendrimers, Targeted drug delivery, Precision medicine

Oxadiazole-based derivatives: synthesis for inflammatory disorders

Ayush Agrawal*

Department of Pharmaceutical Chemistry,

Indubhai Patel College of Pharmaceutical Research Center, Dharmaj, Anand, Gujarat, India.

Corresponding author: aayushagrawal07433@gmail.com

Abstract

Oxadiazole derivatives have emerged as a noteworthy class of compounds in drug discovery due to their diverse pharmacological properties, especially for anti-inflammatory applications. Many novel oxadiazole derivatives are found with healing action in inflammation. Some anlaogs even possess anti-oxidant activity along with free radical inhibition activity. Their therapeutic window reveals advancement in research including molecular docking against COX-2/5-LOX inflammatory targets, revealing strong binding interactions with residues that holds crucial role in enzyme inhibition. These compounds have been shown to modulate other markers of inflammation such as nitric oxide (NO) and interleukin-6 (IL-6), as evidenced by recent studies evaluating both in vitro and in vivo markers. Oxadiazole derivatives represent a promising scaffold in the development of new anti-inflammatory agents, with structural modifications offering avenues to optimize their therapeutic potential.

Keywords: Oxadiazole, binding interaction, molecular docking, scaffold.

Estimation of antihypertensive properties of Betacyanin-loaded Phytosomal formulation, an *in-vivo* study using Wistar male rats

[1]Avnica Tyagi *, [2]Gurvinder Singh, [3]Nitin Sharma, [1] Dr. G.K Gautam

Shri Ram College of Pharmacy, Indraprastha colony, Muzaffarnagar (Uttar Pradesh), 251001, India School of Pharmaceutical Sciences, Lovely Professional University, Phagwara (Punjab), India

Department of Pharmaceutics, Amity Institute of Pharmacy, Amity University, Sector 125, Noida,201313, India

Corresponding author: tyagiavnica27@gmail.com

Abstract

This formulation strategy offers a promising platform for the delivery of Betacyanin and similar hydrophilic phytoconstituents, especially for applications in nutraceuticals, functional foods, and therapeutic antioxidant formulations. Future work may focus on *in-vivo* pharmacokinetic and pharmacodynamic studies.

To evaluate the betacyanin-loaded phytosomes as a prominent antihypertensive property in rats with hypertension induced by DOCA salt. Betacyanin's antihypertensive effect was verified by monitoring the rats' heart rate, diastolic blood pressure, and systolic blood pressure after DOCA salt-induced hypertension.

The present study aimed to develop Betacyanin-loaded Phytosomal formulation, in order to overcome its poor biopharmaceutical properties and to improve its therapeutic efficacy in treating hypertension. Potential *in-vivo* anti-hypertensive activity is observed for 4weeks in DOCA-salt induced hypertensive rats. Finally, a correlation was established in order to understand the clinical implications of the developed novel phytosomes as a suitable antihypertensive agent.

Keywords: Betacyanin, hydrophilic phytoconstituents, phytosomes, hypertension.

Stability-Indicating RP-HPLC Method Development and Validation for Quantification of Molnupiravir in Bulk and Pharmaceutical Formulation

Bushra Ansari[1*], U A Deokate[2], P B Shamkuwar[1]

[1]Department of Pharmaceutical Chemistry, Government College of Pharmacy,

Chhatrapati Sambhaji Nagar, Maharashtra, India

[2]Department of Pharmaceutical Chemistry, Government College of Pharmacy, Karad,

Maharashtra, India

Corresponding author: b.ansari11@yahoo.in

Abstract

This study outlines the development and validation of a simple, accurate, and robust reverse-phase high-performance liquid chromatography (RP-HPLC) method for the quantification of molnupiravir in both bulk drug and capsule dosage forms. The analysis was performed using a Zodiac C18 column (150 × 4.6 mm, 5 µm) with an isocratic mobile phase consisting of 15 mM ammonium acetate, acetonitrile, and methanol in a 70:20:10 (v/v) ratio, at a flow rate of 0.8 mL/min. Detection was carried out at 236 nm, with molnupiravir eluting at approximately 11.7 minutes. Method validation was conducted in accordance with ICH guidelines, assessing parameters such as linearity, accuracy, precision, robustness, sensitivity, and system suitability. The method exhibited excellent linearity over the concentration range of 3.12–100 µg/mL, with a correlation coefficient (R^2) of 0.9999. The limit of detection (LOD) and limit of quantitation (LOQ) were found to be 2.06 µg/mL and 6.87 µg/mL, respectively. Forced degradation studies indicated significant degradation under basic and oxidative conditions, while molnupiravir remained stable in acidic and photolytic environments. The proposed method proves to be reliable for routine quality control and stability testing of molnupiravir in pharmaceutical formulations.

Keywords: Reverse-phase high-performance liquid chromatography (RP-HPLC), molnupiravir, pharmaceutical formulations.

Eco-friendly Analytical Quality by Design HPLC Method for the Quantification of the combined dose formulation of Rosuvastatin and Ezetimibe

Kokilambigai K S[1*], Lakshmi K S[1]

[1]Department of Pharmaceutical Analysis, SRM College of Pharmacy,

SRM Institute of Science and Technology, Kattankulathur, Chengalpattu Dist. – 603203,

Tamil Nadu, India.

Corresponding author: kokilampharm@gmail.com

Abstract

This research demonstrates the advantages of employing Analytical Quality by Design (AQbD) and environmentally friendly solvents for the detection of Rosuvastatin calcium and Ezetimibe by HPLC. A rotatable central composite design was utilized to investigate the influence of ethanol concentration and mobile phase flow rate on k prime, Ezetimibe retention time, and resolution. In adherence to the 12 principles of green chemistry, ethanol was employed in lieu of hazardous solvents owing to its simplicity, efficiency, and ecological compatibility. Chromatographic parameters were tuned using rotatable central composite designs on a Zorbax C18 column (150 × 4.6 mm, 5 µm) with a mobile phase of 0.5% v/v aqueous acetic acid and ethanol (45:55 v/v) at a flow rate of 1.14 mL min^{-1} for a duration of 20 minutes. Rosuvastatin eluted at 4.14 minutes, while Ezetimibe eluted at 9.99 minutes. Additional validation experiments produced favorable outcomes. The HPLC method has been verified as environmentally benign and safe by NEMI, AES, and AGREE. The HPLC method formulated utilizing AQbD and an environmentally friendly approach proved appropriate for the routine analysis of Rosuvastatin calcium and Ezetimibe in pharmaceutical tablets without causing environmental harm.

Keywords: Analytical Quality by Design (AQbD), Ezetimibe retention time, green chemistry.

Role of Herbal Formulation in the Management of Alpoecia

Priyanka Panchal*

Galgotias university, greater Noida

Corresponding author: priyankapanchal3689@gmail.com

Abstract

Alopecia, commonly referred to as hair loss, is a multifactorial disorder that can arise from genetic predisposition, hormonal imbalances, autoimmune reactions, nutritional deficiencies, psychological stress, infections, and environmental influences. The pathophysiology of alopecia varies with its type; however, key mechanisms include miniaturization of hair follicles, disruption of the hair growth cycle, perifollicular inflammation, and immune- mediated destruction of follicular units. In androgenetic alopecia, dihydrotestosterone (DHT)- induced follicular sensitivity leads to progressive hair thinning, while in alopecia areata, T- cell mediated autoimmune attack impairs follicular activity. Conventional therapies, though effective in some cases, are often limited by side effects, high cost, or recurrence of hair loss. Herbal formulations have gained significant attention as preventive and therapeutic alternatives due to their safety, accessibility, and multifaceted bioactive properties.

Phytoconstituents such as flavonoids, alkaloids, terpenoids, and essential oils derived from herbs like *Aloe vera*, *Eclipta alba* (Bhringraj), *Withania somnifera* (Ashwagandha), *Rosmarinus officinalis* (Rosemary), and *Emblica officinalis* (Amla) exhibit antioxidant, anti- inflammatory, anti-androgenic, and hair growth-promoting activities. These natural agents help in restoring follicular function, improving scalp circulation, reducing oxidative stress, and maintaining the hair cycle balance. Preventive strategies incorporating herbal formulations, dietary modulation, and stress management present a holistic approach to reducing the incidence and progression of alopecia. Thus, integrating herbal therapies with modern research provides promising prospects for safe and effective management of hair loss.

Keywords: Alopecia, genetic predisposition, hormonal imbalances, autoimmune reactions.

Nanoparticles in Targeted Drug Delivery for Preventing Aneurysm Rupture and Promoting Vascular Remodelling

Deepika Chauhan[1], Shikha Yadav[2*]

[1]PhD Scholar, School of Medical and Allied Science, Galgotias University, Greater Noida.

[2]Professor, School of Medical and Allied Science, Galgotias University, Greater Noida.

Corresponding Author: 9839455006r@gmail.com

Abstract

Targeted medication delivery using nanoparticles has shown promise in avoiding aneurysm rupture and boosting vascular remodelling. Due to their weaker artery walls, aneurysms carry a high danger of rupturing and causing potentially deadly outcomes. Presently available interventions like endovascular coiling and surgical clipping are intrusive and fraught with danger. Through the direct delivery of therapeutic drugs to the aneurysm site, targeted medication delivery using nanoparticles provides a non-invasive and possibly more effective option.This paper delves into the latest developments in nanoparticle technology specifically designed to treat aneurysms. It talks about the different kinds of nanoparticles used, such as metallic, polymeric, and liposomal nanoparticles, emphasizing their special qualities that improve the effectiveness of therapy and the efficiency of drug administration. In addition, targeting strategies that are employed to attain targeted accumulation of nanoparticles at the aneurysm site are also covered. These strategies include active targeting using ligands that target biomarkers expressed on the aneurysm wall and passive accumulation through increased permeability and retention effect.Additionally, the potential of the therapeutic substances encapsulated in nanoparticles such as growth factors, antioxidants, and anti-inflammatory drugs. To prevent aneurysm rupture and encourage vascular remodelling is investigated. In addition, the study discusses difficulties with biocompatibility, pharmacokinetics, and clearance in nanoparticle-based drug delivery and suggests future research avenues to improve nanoparticle design and therapeutic results.In summary, targeted medication delivery mediated by nanoparticles has enormous potential to transform the way cerebral aneurysms are treated. Realizing the full clinical benefit of this novel strategy for preventing aneurysm rupture and boosting vasculature remodelling will need ongoing research efforts focused on improving therapeutic payloads, fine-tuning nanoparticle composition, and addressing regulatory issues.

Keywords: Nanoparticles, Vascular remodelling, Aneurysm

Herbal Approaches in the Treatment of Stomach-Related Disorders: Insights from Rat Experimental Models

Arzoo*, Ramji Gupta, Nitya Sharma, SanjarAlam

R.V. Northland Institute, Greater Noida, Dadri (203207)

Corresponding author: arzootanwar67@gmail.com

Abstract

Stomach-related disorders such as gastritis, gastric ulcers, and acid reflux are widespread and significantly impact quality of life. Although conventional drugs like proton pump inhibitors and H2 receptor antagonists provide relief, their long-term use is often linked with relapse and side effects. This has increased interest in herbal medicines as safer alternatives or complementary therapies. Experimental rat models serve as reliable platforms for evaluating herbal interventions in gastric disorders. Commonly employed methods include ethanol-induced, indomethacin-induced, stress-induced, and pylorus-ligated ulcer models, which mimic clinical gastric pathology. These models allow for the assessment of gastroprotective and healing activities of herbal preparations. Several medicinal plants, including *Glycyrrhiza glabra* (licorice), *Zingiber officinale* (ginger), *Aloe vera*, *Withania somnifera* (ashwagandha), *Ocimum sanctum* (Tulsi), *Curcuma longa* (Turmeric), and *Camellia sinensis* (Green Tea), have demonstrated strong protective effects in such models. Their phytoconstituents—flavonoids, tannins, alkaloids, and saponins—exert antioxidant, anti-inflammatory, and mucosal-protective actions, thereby reducing gastric acid secretion, enhancing mucosal defense, and promoting healing. Herbal approaches not only address the underlying causes of gastric injury but also offer long-term benefits with fewer side effects compared to synthetic agents. Findings from rat models provide essential insights into the pharmacological potential of herbs and support their translation into clinical applications. This abstract summarizes experimental models, mechanisms, and key herbal agents in managing stomach-related disorders, highlighting the significance of a natural therapeutic approach.

Keywords: Stomach Disorders, Gastric Ulcer, Herbal Medicine, Rat Models, Gastroprotection, Antioxidant, Phytoconstituents.

Agro-Waste valorization: Sustainable pathway for Medicinal innovation

Gurudayal Yadav*, **Prof. (Dr.) Shaweta Sharma**

Research Scholar, Department of Pharmacy, School of Medical and Allied Sciences, Galgotias University, Plot No. 2, Sector 17-A, Yamuna Expressway, Greater Noida, Gautam Budh Nagar, Uttar Pradesh 201310.

Corresponding author: gurudayalyadav98@gmail.com

Abstract

Agro - waste has emerged as a critical global challenge, contributing to environmental pollution and economic loss. However, this waste stream represents a valuable reservoir of bioactive compounds that can be harnessed for medicinal and pharmaceutical applications. Agricultural by-products such as fruit peels, seeds, leaves, husks, and stems are rich in phytoconstituents, including flavonoids, polyphenols, tannins, alkaloids, and essential oils, which possess significant therapeutic potential. Recent studies demonstrate their role in the prevention and management of chronic diseases such as Diabetes, Cardiovascular disorders, and microbial infections. For example, mango leaves, pomegranate peels, and citrus wastes have shown antioxidant, anti-inflammatory, and antimicrobial properties, while also serving as precursors for green synthesis of nanoparticles with enhanced biomedical efficacy. The valorization of agro-waste not only contributes to sustainable healthcare by providing affordable medicinal solutions but also promotes circular bioeconomy principles through effective resource utilization. Moreover, advancements in extraction techniques, nanotechnology, and biotechnological interventions have improved the bioavailability and targeted delivery of these compounds. This approach highlights the dual benefits of agro-waste valorization: addressing environmental concerns and innovating sustainable therapeutics.

Keywords: Agro-waste utilization, Bioactive compounds, Sustainable healthcare, Phytoconstituents, Medicinal applications.

Investigating The Pharmacological Effect of Cetirizine

Monika Bhati*, Ramji Gupta, SanjarAlam

R.V. Northland Institute, Greater Noida, Dadri (203207)

Corresponding author: monikabhati6054@gmail.com

Abstract

Allergy is a widespread condition in which the immune system exhibits hypersensitivity toward normally harmless substances such as dust, pollen, animal dander, or certain foods. These substances, known as allergens, trigger the release of histamine and other inflammatory mediators, resulting in symptoms such as sneezing, nasal congestion, itching, watery eyes, cough, and skin rashes. Allergic conditions affect both children and adults, significantly impairing quality of life if not managed appropriately.

Antihistamine therapy remains one of the most effective approaches to controlling allergic manifestations. Cetirizine, a second-generation H1 receptor antagonist, is widely prescribed for allergic rhinitis, chronic urticaria, and seasonal allergies. By selectively blocking histamine H1 receptors, cetirizine reduces allergy-related symptoms effectively. Unlike first-generation antihistamines, cetirizine has minimal sedative effects as it poorly crosses the blood–brain barrier. Its rapid onset of action, prolonged duration, and favorable safety profile make it suitable for long-term therapy and improve patient adherence.

Thus, cetirizine represents a reliable and well-tolerated option in allergy management, providing effective symptom control with fewer side effects compared to earlier antihistamines. Continued clinical use and research affirm its role as an important pharmacological intervention for allergic disorders.

Keywords: Allergy, Cetirizine, Allergic Rhinitis, H1 Receptor Antagonist, Second-Generation Antihistamines.

Cardioprotective Effects of Multitherapy Approaches: Experimental Insights

Shyam Babu*, Ramji Gupta, Nitya Sharma, SanjarAlam

R.V. Northland Institute, Greater Noida, Dadri (203207)

Corresponding author: ramjicops@gmail.com

Abstract

Cardiovascular diseases (CVDs), including heart attacks, hypertension, and heart failure, are major causes of illness and death worldwide. These conditions often involve multiple factors such as oxidative stress, inflammation, high blood pressure, and damage to heart tissue. Treating CVDs with a single drug may not fully protect the heart, which has led to the study of multitherapy approaches that combine drugs, natural compounds, or lifestyle interventions to improve heart health. Experimental studies in rats and mice have shown that combining medicines like beta-blockers, ACE inhibitors, and statins with natural agents such as plant extracts or antioxidants can provide stronger protection than single therapies. These combinations work by reducing oxidative stress, lowering inflammation, improving blood flow, protecting heart cells from damage, and preventing harmful changes in the heart structure. Multitherapy can also reduce side effects by using lower doses of individual drugs while maintaining effectiveness. Rat models of heart damage, including myocardial infarction, drug-induced cardiotoxicity, and high blood pressure, help researchers study the mechanisms and benefits of these combined treatments. Such studies provide important insights into how multitherapy can improve heart function and prevent damage. This abstract highlights the potential of multitherapy in protecting the heart, focusing on experimental evidence, mechanisms of action, and practical relevance. Understanding these approaches could help develop safer and more effective treatments for cardiovascular diseases.

Keywords: Cardioprotection, Multitherapy, Oxidative Stress, Heart Damage, Rat Models, Antioxidants, Inflammation.

Assessment of Drug-Induced Nephrotoxicity in Experimental Models: Mechanisms and Evaluation Approaches

Srishti*, Ramji Gupta, Sanjar Alam

R.V. Northtland Institute, Greater Noida, Dadri (203207)

Corresponding author: sksrishti246@gmail.com*

Abstract

Drug-induced nephrotoxicity is a major contributor to acute kidney injury (AKI), accounting for nearly 20–25% of all reported cases. The kidney, being the primary site for drug excretion and biotransformation, is highly vulnerable to toxic insults from therapeutic agents. Nephrotoxic effects can arise from antibiotics, chemotherapeutic agents, immunosuppressants, and various non-steroidal anti-inflammatory drugs (NSAIDs). These agents exert toxic effects through mechanisms such as oxidative stress, mitochondrial dysfunction, altered renal hemodynamics, tubular necrosis, and apoptosis. Experimental models provide a critical platform to investigate the mechanisms of nephrotoxicity, evaluate drug safety, and develop nephroprotective strategies. Both in vivo and in vitro models have been widely employed. Rodent models, particularly rats and mice, are frequently used to mimic drug-induced renal injury through agents like gentamicin, cisplatin, or adriamycin, which replicate clinical manifestations of nephrotoxicity. Biochemical markers such as serum creatinine, blood urea nitrogen (BUN), cystatin-C, and urinary protein serve as standard indicators of renal dysfunction, while histopathological analysis confirms structural alterations. Understanding pathogenic mechanisms in experimental models aids in identifying molecular targets and designing novel therapeutic interventions. Additionally, herbal and natural products with antioxidant and anti-inflammatory potential are gaining attention as nephroprotective agents. The integration of conventional and molecular biomarkers with mechanistic insights enhances the translational relevance of experimental findings.

Keywords: Nephrotoxicity, Experimental Models, Drug-Induced Kidney Injury, Oxidative Stress, Renal Function, Nephroprotection

Development of Sitagliptin Buccal Films for Antidiabetic Therapy

Supriya[1]*

Department of Pharmaceutics, Goel Institute of Pharmacy and Sciences, Lucknow, 226028, India

Corresponding author: sdauntless2@gmail.com

Abstract

Sitagliptin is an antidiabetic agent frequently used for type 2 diabetes, but its oral bioavailability is limited due to extensive first-pass metabolism. This study aims to prove the bioavailability of sitagliptin by formulating mucoadhesive buccal films as an alternative to traditional tablets. Mucoadhesive buccal films were prepared by the solvent casting method using hydroxypropyl methylcellulose (HPMC) and sodium alginate as the main polymers. The films were evaluated for thickness, folding endurance, surface pH, drug content, and mucoadhesive strength. In vitro drug release and ex vivo permeation studies were conducted using porcine buccal mucosa. The optimized films showed a uniform appearance and good flexibility. Drug release studies indicated sustained and controlled sitagliptin release up to 6 hours. Permeation studies revealed higher drug absorption through the buccal membrane compared to oral tablet delivery, and the films remained stable during storage. Mucoadhesive buccal films of sitagliptin can improve bioavailability, reduce dosage frequency, and enhance patient compliance. This technique provides a promising alternative drug delivery system for diabetic therapy.

Keywords: Sitagliptin, mucoadhesive buccal film, antidiabetic, HPMC, sodium alginate.

In-Vivo Study of Atorvastatin Calcium-Loaded Guar Gum Microspheres for Colon Targeting in Ulcerative Colitis

Om Krishna Pandey*, Vinay Kumar Soni, Sanjiv Kumar Chaudhri

Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Sector-II, Dr. Akhilesh Das Nagar, Ayodhya Road, Lucknow, Uttar Pradesh 226028, India

Corresponding author: omkrishnapandey2612@bbdniit.ac.in

Abstract

Inflammatory bowel disease is a group of inflammatory conditions of the colon and small intestine; ulcerative colitis is one of them. Atorvastatin calcium is antihyperlipidemic drug showing promising effect in treating ulcerative colitis. The aim of the present study was to perform in-vivo study on atorvastatin calcium loaded guar gum microspheres for colon targeting in ulcerative colitis. Guar gum coating prevented premature drug release in the GIT. The formulation was prepared by the emulsion cross-linking method. The optimized batch was screened and characterized for different parameters. *In-vivo* study was performed using acetic acid induced colitis rat-model. Three days post induction of colitis, the animals were treated for seven consecutive days. Clinical scoring was done for changes in the weight of the animals, stool characteristics, rectal bleeding. Based on the histopathological reports, the negative group showed enteritis characterized by massive necrosis destruction of epithelium. However, no significant changes were observed after administration of atorvastatin calcium drug solution in the standard group, while a decrease in inflammation was observed in the test group. Thus, the study concluded that atorvastatin calcium loaded guar gum microspheres may be a promising treatment for ulcerative colitis as compared to pure atorvastatin calcium.

Keywords: Atorvastatin Calcium, Microspheres, Ulcerative colitis.

Probiotics and Prebiotics in the Prevention and Management of Gastric and Duodenal Ulcers

Amita Bhati, Lalit Parihar, Dr. Sanjar Alam

R. V. Northland Institute, Chithera, Dadri, G. B. Nagar, Uttar Pradesh, India

Corresponding author: amita.nagar0007@gmail.com

Abstract

Gastric and duodenal ulcers remain a major global health concern, often arising from *Helicobacter pylori* infection, chronic use of non-steroidal anti-inflammatory drugs (NSAIDs), stress, or lifestyle-related factors. Conventional therapies, including proton pump inhibitors and antibiotics, are effective but are increasingly limited by drug resistance, relapse, and adverse effects. Recent evidence highlights the potential role of probiotics and prebiotics as adjunctive or alternative strategies in the prevention and management of peptic ulcers. Probiotics exert gastroprotective effects through competitive inhibition of *H. pylori* adhesion, modulation of mucosal immunity, enhancement of mucus secretion, and regulation of inflammatory responses. Prebiotics, by selectively promoting beneficial microbial growth, improve mucosal barrier integrity and reduce oxidative stress, thereby facilitating ulcer healing. In combination, synbiotics may offer synergistic benefits by restoring microbial balance, reducing pathogenic colonization, and promoting epithelial regeneration. This review consolidates current insights into the mechanisms and therapeutic potential of probiotics and prebiotics in ulcer prevention and treatment, with emphasis on clinical findings, experimental evidence, and future perspectives. A better understanding of these microbiome-based interventions could provide safe, cost-effective, and sustainable options for ulcer management in the era of rising antimicrobial resistance.

Keywords: Probiotics, Prebiotics, Gastric ulcer, Duodenal ulcer, *Helicobacter pylori*, Gastroprotection.

Role of the Intestinal Ecosystem in Neuroinflammation and Neuroprotection

Lalit Parihar[1,2], Ajay Pal Singh [1], Sanjar Alam[2]

[1] School of Pharmacy, Lingaya's Vidyapeeth, Faridabad, Haryana, India

[2] R. V. Northland Institute, Chithera, Dadri, G. B. Nagar, Uttar Pradesh, India

Corresponding author: lalitpparihar@gmail.com

Abstract

The intestinal ecosystem has emerged as a pivotal regulator of brain health, exerting profound influence on neuroinflammation and neuroprotection through the bidirectional gut–brain axis. Disruptions in the intestinal microbial balance trigger immune dysregulation, increased intestinal permeability, and elevated production of pro-inflammatory mediators, which collectively contribute to neuroinflammatory cascades. Conversely, a balanced ecosystem produces metabolites such as short-chain fatty acids, indoles, and tryptophan derivatives that strengthen blood–brain barrier integrity, modulate microglial activation, and promote neuronal survival. Preclinical and clinical studies have linked intestinal dysbiosis with neurodegenerative disorders including Alzheimer's disease, Parkinson's disease, and multiple sclerosis, highlighting its contribution to disease onset and progression. At the same time, restoration of intestinal homeostasis through dietary modulation, probiotics, prebiotics, and fecal microbial transplantation has demonstrated potential in reducing neuroinflammation and enhancing neuroprotection. This review explores the mechanistic underpinnings of intestinal ecosystem–brain interactions, delineates their role in neurological disorders, and discusses therapeutic opportunities targeting the gut–brain axis. Understanding these complex interactions may open new avenues for microbiome-based interventions in the prevention and management of neuroinflammatory and neurodegenerative diseases.

Keywords: Intestinal ecosystem, Neuroinflammation, Neuroprotection, Gut–brain axis, Microbial metabolites, Neurodegenerative disorders

1,8-Cineole (Eucalyptol) And Its Interaction with Nitric Oxide (NO) In Stress-Allied Adjuvant-Induced Rheumatoid Arthritis in Rats

Lavkush Tiwari[1*], Nitu Nigam[2]

[1]Ph.D Scholar, Centre for Advanced Research, King George's Medical University, UP, Lucknow-226003, India.

[2]Additional Professor, Centre for Advanced Research, King George's Medical University, UP, Lucknow-226003, India.

Corresponding author:lav4pharma@gmail.com

Abstract

Background: Rheumatoid arthritis (RA) is a chronic autoimmune disease marked by synovial inflammation, oxidative stress, and joint damage. The Complete Freund's Adjuvant (CFA)-induced arthritis model in rodents closely mimics human RA. Eucalyptol, a natural monoterpene oxide, has known anti-inflammatory and antioxidant properties.

Objective: This study evaluated the therapeutic potential of Eucalyptol alone and in combination with Methotrexate in Stress Allied CFA-induced arthritis in Wistar rats, focusing on inflammation, oxidative stress, and functional recovery.

Methods: Arthritis was induced with CFA on Day 0. From Day 14 to 28, rats were treated across eight groups including Control, CFA only, and various combinations of Eucalyptol (200 mg/kg), Methotrexate (1 mg/kg), L-NAME (10 mg/kg), and L-Arginine (100 mg/kg). Behavioral outcomes such as locomotor activity, speed, and grip strength were assessed.

Results: CFA significantly impaired locomotor and muscular function. Combination therapy with Eucalyptol and Methotrexate showed the greatest improvement, nearly restoring baseline function. Methotrexate alone showed substantial benefits, while Eucalyptol monotherapy and Eucalyptol + L-NAME provided moderate recovery. Eucalyptol + L-Arginine offered partial improvement.

Conclusion: Eucalyptol enhances anti-arthritic efficacy, especially with Methotrexate, indicating its promise as a supportive therapy in RA.

Keywords: Rheumatoid arthritis, CFA model, Eucalyptol, Methotrexate, Oxidative stress, Cytokines, Locomotor function.

The Microbial Regulation of the Brain: Insights into Cognitive Disorders

Sumit Kashyap, Lalit Parihar, Dr. Sanjar Alam

R. V. Northland Institute, Chithera, Dadri, G. B. Nagar, Uttar Pradesh, India

Corresponding author: sumitkashyap5698@gmail.com

Abstract

The intricate bidirectional communication between the brain and the intestinal microbial ecosystem has emerged as a critical determinant of cognitive health. Growing evidence suggests that alterations in microbial composition and activity can influence neuronal signaling, neuroinflammation, neurotransmitter balance, and metabolic pathways, thereby contributing to the onset and progression of cognitive disorders. Mechanistic studies highlight the role of immune modulation, microbial metabolites such as short-chain fatty acids and tryptophan derivatives, and vagus nerve-mediated signaling in shaping cognitive function. Dysregulation of this brain–microbe dialogue has been associated with Alzheimer's disease, dementia, depression, autism spectrum disorders, and stress-related cognitive decline. Recent clinical and preclinical findings also indicate that dietary interventions, probiotics, psychobiotics, and fecal microbial transplantation hold therapeutic potential in restoring cognitive function. This review synthesizes current insights into microbial regulation of the brain, delineates its role in cognitive disorders, and discusses emerging therapeutic opportunities and translational challenges. A deeper understanding of this complex interplay may pave the way for novel microbiome-targeted strategies to prevent and manage cognitive dysfunction.

Keywords: Brain–microbe communication, Cognitive disorders, Neuroinflammation, Microbial metabolites, Psychobiotics.

Ranitidine-Induced Safety Concerns: A Comparative Perspective with Thalidomide Tragedy

Sudhanshu Saraswat*

Dharm Samaj College of Pharmacy, Aligarh, Uttar Pradesh

Corresponding author: sudhanshusaraswat45@gmail.com

Abstract

Ranitidine, a widely used H2-receptor antagonist for the treatment of acid-related gastrointestinal disorders, recently attracted global attention due to potential contamination with N-Nitrosodimethylamine (NDMA), a probable human carcinogen. This situation evokes historical parallels with the thalidomide tragedy; wherein widespread use of a pharmaceutical agent led to unforeseen teratogenic outcomes. While thalidomide caused severe birth defects due to inadequate preclinical testing, ranitidine's NDMA contamination highlights gaps in post-marketing surveillance, manufacturing practices, and regulatory oversight. Reports suggest long-term consumption of contaminated ranitidine may elevate cancer risk, especially gastrointestinal cancers, though epidemiological evidence is still emerging. This case underscores the critical need for vigilant pharmacovigilance, rigorous quality control, and timely regulatory action to prevent drug-induced public health crises. The ranitidine episode serves as a cautionary tale, emphasizing that lessons from past drug tragedies must inform contemporary drug safety frameworks.

Keywords: Ranitidine, N-Nitrosodimethylamine (NDMA), thalidomide tragedy, drug safety.

Network-Based Analysis of Kaempferol Reveals Multitarget Interactions Underlying Its Antidiabetic Potential

Prashant Kumar, Shashi Bhooshan Tiwari*

[1,2*]Department of Pharmacy, MJP Rohilkhand University, Bareilly, Uttar Pradesh, India- 243006

Corresponding author: s.tiwari@mjpru.ac.in

Abstract

This research work based on the protein–protein interaction (PPI) network highlights the multifaceted mechanisms through which kaempferol may exert antidiabetic effects. At the center of the network, kaempferol is linked to xenobiotic-sensing and metabolic enzymes, particularly the aryl hydrocarbon receptor (AHR), cytochrome P450 1B1 (CYP1B1) and several UDP-glucuronosyltransferases (UGT1A3, UGT1A7, UGT1A8, UGT1A9 and UGT3A1). These interactions indicate a coordinated modulation of phase I and II metabolism, which can improve the bioavailability and detoxification of glucose-modulating phytochemicals and reduce oxidative stress—both crucial in diabetes management. Connections with the pregnane X receptor (NR1I2/PXR) point to nuclear receptor-mediated regulation of detoxifying and glucose-handling enzymes, supporting improved hepatic and intestinal metabolism of xenobiotics and endogenous ligands during hyperglycemia. In addition, peripheral links to cell-cycle regulators such as CDK1 and signaling kinases like RPS6KA3 suggest that kaempferol influences insulin-sensitive pathways, pancreatic β-cell proliferation, and inflammation. Together, this network implies that kaempferol does not act through a single target but modulates a cluster of metabolic, receptor and cell-signaling proteins whose combined actions—improved antioxidant defense, enhanced phase II conjugation, regulation of nuclear receptors, and modulation of kinase activity—may underlie its reported antidiabetic and insulin-sensitizing properties.

Keywords: Antidiabetic, Kaempferol, Protein Protein Interaction and Network Pharmacology

Emerging Hybrid Approaches for the Integrated Management of Type 2 Diabetes and Hypertension

Asiya Parveen[1*], Shazia Parveen[2], Nisha Vats[1], Mohd. Shafeeque[1], Akram Choudhary[1],

M. Shahar Yar[1*]

[1]Department of Pharmaceutical Chemistry, School of Pharmaceutical Education and Research, Jamia Hamdard, Hamdard Nagar, New Delhi – 110062.

[2]Department of Pharmaceutical Biotechnology, School of Pharmaceutical Education and Research, Jamia Hamdard, Hamdard Nagar, New Delhi – 110062.

Corresponding author: yarmsy@rediffmail.com

Abstract

The coexistence of type 2 diabetes mellitus (T2DM) and hypertension represents a major global health challenge, substantially increasing the risk of cardiovascular and renal complications. Conventional management often relies on polypharmacy, which may compromise adherence and lead to drug–drug interactions. The concept of *hybrid drug therapy*—encompassing both fixed-dose combinations and single-molecule hybrids—has emerged as a promising approach to simultaneously address hyperglycemia and elevated blood pressure. Recent advances in antidiabetic therapy, including sodium–glucose cotransporter-2 (SGLT2) inhibitors, glucagon-like peptide-1 receptor agonists (GLP-1RAs), and dual incretin agonists such as tirzepatide, have demonstrated not only glycemic efficacy but also blood pressure reduction and organ protection. Similarly, antihypertensive agents such as renin–angiotensin system blockers exhibit favorable metabolic effects when combined with antidiabetic drugs. Preclinical efforts in molecular hybridization further aim to integrate antihypertensive and antidiabetic pharmacophores within a single scaffold, offering potential for synergistic efficacy and simplified pharmacokinetics. Despite these advances, challenges remain in optimizing safety, regulatory approval, and cost-effectiveness. This article highlights the evolving landscape of hybrid strategies in diabetes and hypertension management and future directions for cardio-metabolic drug development.

Keywords: Antidiabetic, hybrid compound, Antihypertension, Synergistic efficacy.

Papain-Encapsulated Selenium Nanoparticles as a Novel Drug Delivery System for Hepatocellular Carcinoma: Evidence from 2D, 3D, and In Silico Studies

Mustafa Hatem Nafea* [1, 2], Majid Sakhi Jabir[3], Ahmed Abdullah Mohammed[2], Mogana Das Murtey[2]

[1]College of Biomedical Engineering, University of Technology-Iraq

[2]School of Dental Sciences, University Sains Malaysia, Kubang Kerian, Kelantan, Malaysia

[3]College of Applied Sciences, University of Technology- Iraq, Baghdad, Iraq

Corresponding author: mustafa.h.nafea@student.usm.my

Abstract

Recent progress in nanomedicine and nanotechnology has expanded the range of multifunctional nanostructures. Hence, novel solutions have been generated for targeted systems to deliver medication in oncology and nuclear medicine. Papain is a *Carica papaya* protease that is a feasible green nanotechnology option given its medicinal properties, such as effects against cancer. This study examined the use of papain-loaded selenium nanoparticles (Pap-Se NPs) against HepG2 hepatocellular carcinoma cells. The Pap-Se NPs were prepared by chemical synthesis. UV–Vis, Fourier transform infrared, and transmission electron microscopy (TEM) were used to examine the structural, optical, and morphological characteristics of the Se NPs. The activity of the Se NPs, Papain, and Pap-Se NPs against cancer was examined using a cytotoxicity assay and acridine orange/ethidium bromide (Ao/EB) staining. Pap-Se NPs showed a higher cytotoxicity rate than Se NPs alone. The growth of spheroids in a three-dimensional (3D) model of HepG2 cells was reduced by Pa-Se NPs. Molecular docking determined the optimal Pa-Se NP conformation against the 7ZA2 receptor in hepatocellular carcinoma cells. Se-Pap nanopreparation has strong in vitro activity and holds promise as a potential candidate for further development towards clinical applications as an anticancer agent.

Keywords: nanomedicine, nanotechnology, Papain, *Carica papaya.*

Rising Prevalence of Polycystic Ovary Syndrome: A Global Women's Health Challenge

Aarushi Saini*, Nitya Sharma, Ramji Gupta, Sanjar Alam

R.V. Northland Institute, Dadri, Greater Noida (203207)

Corresponding author: *sainiaarushi6@gmail.com

Abstract

Polycystic Ovary Syndrome (PCOS) is one of the most common endocrine and metabolic disorders affecting women of reproductive age, with a global prevalence estimated between 8–20%, and rising steadily due to changing lifestyle and environmental factors. Characterized by ovulatory dysfunction, hyperandrogenism, and polycystic ovarian morphology, PCOS presents with irregular menstrual cycles, infertility, hirsutism, acne, and metabolic complications.

The increasing incidence of PCOS is strongly linked to sedentary lifestyle, unhealthy diet, obesity, insulin resistance, and chronic stress. Genetic and epigenetic factors also play a significant role, making PCOS a complex, multifactorial condition. Beyond reproductive consequences, PCOS is associated with type 2 diabetes, metabolic syndrome, cardiovascular risks, and psychological disorders such as anxiety and depression, thereby affecting both physical and mental health.

Despite its high prevalence, PCOS often remains underdiagnosed or misdiagnosed, delaying timely management. Early recognition and intervention are essential to reduce long-term complications. Management strategies include lifestyle modifications, weight management, insulin-sensitizing agents, hormonal therapy, and counseling for psychological support.

The growing number of PCOS cases worldwide highlights the need for greater awareness, standardized diagnostic criteria, community-level screening, and holistic treatment approaches. Addressing PCOS as both a reproductive and metabolic disorder is critical for improving women's health outcomes globally.

Keywords: Polycystic Ovary Syndrome, PCOS, Women's Health, Hyperandrogenism, Infertility, Insulin Resistance, Metabolic Syndrome, Lifestyle Disorders, Prevalence.

Development and Validation of QbD-Based RP-HPLC and Green UHPLC Methods for Sustainable Analysis and Future Bilayer Formulation of Antidiabetic Drugs

Marina Juliet A [1]*, Karthikeyan Elumalai [2]

[1]Research Scholar, Saveetha College of Pharmacy, Saveetha Institute of Medical and Technical Sciences (SIMATS), Thandalam, Chennai-602105

[2]Department of Pharmaceutical Chemistry, Saveetha College of Pharmacy, Saveetha Institute of Medical and Technical Sciences (SIMATS), Thandalam, Chennai-602105

Corresponding author: julietsamag95@gmail.com

Abstract

The simultaneous quantification of active pharmaceutical ingredients and the development of innovative pharmaceutical forms are essential to ensure quality control and therapeutic efficacy in the field of antidiabetic treatment. This study presents a quality-by-design (QBD) RP-HPLC method using central composite design to quantify lobeglitazone sulphate and glimepiride in bulk and combined doses. The method has been optimised and validated in accordance with ICH guidelines and has yielded accurate, precise and reliable results with mobile ACN:KH_2PO_4 buffer (pH 3.5, 50:50 v and v) and 227 nm detection. In addition, for future work, a bilayer tablet will be developed combining the Glipin and Glifozin classes to improve antidiabetic therapy by prolonged release and improved adherence. UHPLC development and validation will highlight the principles of green analytical chemistry, with a focus on minimising the use of solvents, energy consumption and the impact on the environment Chemometric instruments, in particular JASP statistical software, will be used to analyse the data and optimise the methods. An assessment of environmental performance will be carried out to ensure sustainable analytical procedures. This combined approach highlights the potential to integrate QbD frameworks, green methodologies and advanced chemical methods to assess drug quality in a sustainable, effective and accurate manner, which will contribute to future advances in antidiabetic drug research.

Keywords: Lobeglitazone, Glimepiride, Quality by Design, RP-HPLC, Green Analytical Chemistry.

To study forced degradation behavior of Tivozanib HCl under forced degradation conditions- A comprehensive Liquid chromatography-Mass Spectroscopy and *In-silico* study

Snehal S. Ukhade[1]

[1]PhD Scholar, Department of Pharmaceutical Chemistry, MET's Institute of Pharmacy, Bhujbal Knowledge City, Affiliated to Savitribai Phule Pune University, Adgoan, Nashik, India.

Corresponding author: snehalukhade712@gmail.com

Abstract

This research investigated the forced degradation of Tivozanib HCl, establishing and validating a Reverse Phase-High Performance Liquid Chromatography (RP-HPLC) method, and then employing in silico methods to evaluate the therapeutic and toxicological characteristics of its degradation products. Tivozanib HCl was exposed to various stress conditions—oxidative, thermal, photolytic, acidic, alkaline, and hydrolytic—to determine its degradation pathways. Chromatographic separation was achieved on an ODS C-18 column utilizing a mobile phase composed of Methanol and Water in a 75:25 % v/v ratio. The developed method was subsequently validated in accordance with ICH Q2 (R1) guidelines. Liquid Chromatography-Mass Spectrometry (LC-MS) was utilized to identify the specific degradation products formed under alkaline stress. Molecular docking, performed with AutoDock using PDB ID: 3VHE, assessed the potential of these degradation products to inhibit VEGF receptor tyrosine kinase. Additionally, Toxtree and PASS software were employed for the prediction of toxicity and biological activity, respectively. The findings indicated that significant degradation of Tivozanib HCl occurred exclusively under alkaline conditions.The validated RP-HPLC method demonstrated effective separation of the drug from its degradation products and exhibited linearity within the 80%–120% concentration range. Two previously uncharacterized degradation products were identified and subjected to further analysis. Molecular docking results suggested that these degradation products might retain some VEGF inhibitory potential, while toxicity predictions raised certain safety concerns. This comprehensive study provides valuable insights into the degradation profile of Tivozanib HCl, supporting both drug development and regulatory compliance efforts.

Keywords: Tivozanib HCl, Reverse Phase-High Performance Liquid Chromatography (RP-HPLC), Liquid Chromatography-Mass Spectrometry (LC-MS), Molecular docking.

Health Science and Technology Approach for Gastric Disorders: Gastroretentive Herbal Formulation Targeting *H. pylori*

Rajiv Yadav*, Sonia Parashar, Pawan Kumar Jalwal

Faculty of Pharmaceutical Sciences, Baba Mastnath University, Asthal Bohar, Rohtak, Haryana, India.

Corresponding Author: rajivkarira@gmail.com

Abstract

Gastric disorders, primarily caused by *Helicobacter pylori*, affect millions worldwide and contribute to chronic gastritis, peptic ulcers, and gastric cancer. Conventional antibiotic therapies, though effective, are increasingly limited by rising antimicrobial resistance, adverse effects, and poor patient compliance. This necessitates the exploration of alternative, sustainable therapeutic strategies.

Herbal medicines offer a promising solution due to their multi-targeted pharmacological effects and favorable safety profiles. *Mangifera indica* (mango leaves) is rich in bioactive compounds such as mangiferin, flavonoids, and phenolics, which exhibit anti-*H. pylori*, antioxidant, and gastroprotective activities. However, clinical application is often hindered by poor solubility, instability in acidic gastric conditions, and limited retention in the stomach.

Gastroretentive drug delivery systems (GRDDS), including floating and mucoadhesive formulations, can enhance gastric residence time and allow localized release of herbal phytoconstituents, thereby improving therapeutic efficacy. Literature evidence highlights that integrating herbal therapy with advanced drug delivery technology represents a novel approach in health science, offering targeted, sustained, and patient-friendly management of gastric infections.

This paper reviews existing studies on *H. pylori* infection, herbal gastroprotective agents, and GRDDS, emphasizing the synergy of health science and technology. Further preclinical and clinical validation, along with standardization of herbal extracts, is essential to establish these gastroretentive herbal formulations as effective alternatives to conventional therapies.

Keywords: *Helicobacter pylori*, gastric disorders, *Mangifera indica*, herbal medicine, gastroretentive drug delivery system, health science and technology.

AI-powered predictive models for patient response to biologics

Pankaj Mishra, Chanchal Sharma, Avijit Mazumder

Noida Institute of Engineering and Technology (Pharmacy Institute), Greater Noida, U.P. 201306

Corresponding author: mishrap2702@gmail.com

Abstract

Day by day medicines are not confined to chemical-based drugs. There is an alternative new and better category of drugs made from living organisms called as Biologics. Biologics are therapeutic products derived from living organisms, including monoclonal antibodies, vaccines, recombinant proteins, and gene therapies. It has an ability to target diseases with high specificity makes them essential in treating disease conditions like cancer, autoimmune diseases, diabetes, and rare genetic disorders. Biologics revolutionized chronic disease management, yet up to 40% of patients show poor response. AI offers predictive models integrating clinical and genomic data for personalized, effective treatment strategies. Machine learning algorithms (Random Forest, XGBoost, Deep Neural Networks) were trained on panomics datasets and electronic health records. Predictive features included genetic polymorphisms, cytokine profiles, and patient demographics. Model performance was evaluated using cross-validation and ROC-AUC metrics. Preliminary findings demonstrate that AI models achieved >85% accuracy in predicting responders vs non-responders. Feature importance analysis revealed genetic variants in TNF-α and IL-6 pathways as top predictors. Integration of real-world clinical data further improved prediction robustness. AI-powered predictive models show strong potential in optimizing biologic therapy by enabling personalized treatment decisions. Future work will focus on prospective validation and clinical implementation.

Keywords: Artificial Intelligence, Biologics, Predictive Models, Personalized Medicine, Immunology.

Pharmacological And Phytochemical Evaluation of Cardioprotective Activity of Some Medicinal Plants

Varsha Patwekar[1]*, Dr V G. Rajurkar[2]

[1]PhD scholar at Dr Ved Prakash Patil College of Pharmacy, Chhatrapati Sambhaji Nagar, Maharashtra, India

[2]Principal, Dr Ved Prakash Patil College of Pharmacy, Chhatrapati Sambhaji Nagar, Maharashtra, India

Corresponding author: vdlad91@gmail.com

Abstract

Background and the purpose of the study: The objectives of the present study were phytochemical and pharmacological screening of the effects of various extracts of plant parts of Curcuma Longa (Turmeric) and Geranium plant on cardiac functions.

Methods: The juvenile rhizomes of turmeric plant and geranium leaves were extracted with ethanol by cold maceration, supercritical extraction, UAE, and Soxhlet extraction methods and subjected to spectrophotometric analysis to determine flavonoids, phenolic compounds and Proanthocyanidins. High-Performance Liquid Chromatography–Tandem Mass Spectrometry and UV-VIS were used to determine phenolic constituents. For cardioprotective activity, the test drugs were administered daily for 30 days and on 28th and 29th isoproterenol was injected to induce cardiotoxicity. Various changes were estimated post isoproterenol injection. Various biochemical changes in the serum or cardiac homogenates were estimated.

Results: Phytochemical screening indicated the presence of phenolic compounds with differentiate proportion in various used extraction methods. With 539.96 mg GA/100 g of material, the supercritical process produced the highest content of total phenolic components. The cold maceration extraction method yielded the lowest total phenolic content (179.43 mg GA/100 g of material). Turmeric (400 mg/kg) and Geranium (400 mg/kg) both show the highest antioxidant activity among the test compounds. These groups demonstrate high levels of SOD, GSH and CAT while showing the lowest MDA levels, indicating significant cardioprotective effects and antioxidant activity. Turmeric (200 mg/kg) and Geranium (200 mg/kg) also show good antioxidant effects, although not as effective as the higher doses. The Normal Control group exhibits low antioxidant levels and high MDA, suggesting significant oxidative stress. The Standard Control group, known for its antioxidant properties, shows high SOD, GSH and CAT levels, with very low MDA, indicating strong cardioprotective effects. Vehicle Control shows lower antioxidant potential and higher MDA levels compared to the test compounds.

Conclusion: Turmeric (400 mg/kg) and Geranium (400 mg/kg) are the most effective in providing cardio protective and antioxidant properties. These compounds significantly reduce oxidative stress and lipid peroxidation.

Keywords: Cardioprotective, Turmeric, geranium, Isoproterenol.

Targeting Excitotoxicity in Neurodegeneration: Exploring Novel Pharmacophores via Chemical Synthesis

Yogita Dhurandhar, Kamta P. Namdeo*

Department of Pharmacy, Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur

Chhattisgarh, India

Corresponding author: knamdeo@yahoo.com

Abstract

Alzheimer's disease (AD) continues to be a major threat to the general public's health, necessitating the research and development of innovative treatment approaches. The advancement of Alzheimer's disease has been linked to glutamate excitotoxicity, which makes it an interesting target for the development of new drugs. Our objective shall be to improve the efficacy of anti- Alzheimer's treatment by employing a rational drug design strategy that focuses on modulating the glutaminergic system. In this study, we aim to design and synthesize a series of derivatives of oxymatrine, a natural alkaloid known for its neuroprotective properties in conjunction with amino acid due to its potential to cross the blood-brain barrier. Firstly, docking studies shall be conducted to determine interactions with glutamate receptors. The best-fitting agents shall then be synthesized and characterized using analytical techniques. Anti-Alzheimer study of the synthesized derivatives shall be conducted using the high-fat diet-induced Alzheimer model. Cognitive performances shall be determined using the Radial arm maze and Hebbs-William's maze. Glutamate, NMDA and Aβ expressions, along with other excitotoxic parameters like calcium, shall be assessed using ELISA in the plasma and brain extracts of the experimental animals. Through this study, these novel derivatives of oxymatrine might show potential to be considered as therapeutic candidates in the research and development of effective treatments for Alzheimer's disease.

Keywords: Oxymatrine, Alzheimer's Disease, Neurodegeneration, Amino acids, BBB.

AI-Powered Decision Support Systems in Robotic Surgery

Vinit Srivastava, Chanchal Sharma, Avijit Mazumdar

Noida Institute of Engineering and Technology (Pharmacy Institute), Greater Noida, U.P. 2013061

Corresponding author: vinit1201.vns@gmail.com

Abstract

Robotic surgery, known for its minimally invasive techniques and computer-controlled robotic arms, has revolutionized modern medicine by providing improved dexterity, visualization, and tremor reduction compared to traditional methods. The integration of AI into robotic surgery has further advanced surgical precision, efficiency, and accessibility. Initially, AI applications in robotic surgery focused on automating tasks like suturing and tissue dissection to enhance consistency and reduce surgeon workload. Present AI-driven systems functionalities such as image recognition, motion control, and haptic feedback, allowing real-time analysis of surgical field images and optimizing instrument movements for surgeons. The advantages of AI integration include enhanced precision, reduced surgeon fatigue, and improved safety. Despite its advantages, challenges such as data privacy, high implementation costs, and the need for standardized training remain. Regulatory hurdles and workflow integration also present obstacles. Future directions for AI integration in robotic surgery include enhancing autonomy, personalizing surgical approaches, and refining surgical training through AI-powered simulations and virtual reality. AI-powered robotics supports remote surgery (telesurgery), making advanced procedures accessible to patients in underserved regions. The integration of AI also facilitates postoperative care through continuous monitoring and outcome prediction. As technology advances, AI-driven robotic surgery holds the potential to revolutionize surgical practice, reduce recovery times, and improve overall patient safety and outcomes. Overall, AI integration holds promise for advancing surgical care, with potential benefits including improved patient outcomes and increased access to specialized expertise. Addressing challenges and promoting responsible adoption are essential for realizing the full potential of AI-driven robotic surgery.

Keywords: Artificial Intelligence, Robotic Surgery, Machine Learning, Telesurgery, Surgical Precision, Healthcare Technology.

Pharmacological Potential of Randia dumetorum for Treating Diabetes Mellitus

Priyanshi Goyal[1], Shaweta Sharma[2*]

[1]Research Scholar, Department of Pharmacy, Galgotias University, Greater Noida, UP, India

[2]School of Medical and Allied Sciences, Galgotias University, Greater Noida, UP, India

Corresponding author: shawetasharma@galgotiasuniversity.edu.in

Abstract

Randia dumetorum (family Rubiaceae), commonly known as the emetic nut or "Madanphal," is a traditional medicinal plant widely used in Ayurveda and folk medicine. Recent pharmacological investigations have highlighted its potential in the management of diabetes mellitus, a chronic metabolic disorder characterized by hyperglycemia and associated complications. Phytochemical analysis of *R. dumetorum* fruit, seeds, and bark has revealed the presence of bioactive constituents such as saponins, flavonoids, alkaloids, glycosides, and phenolic compounds, which exhibit antioxidant, hypoglycemic, and antihyperlipidemic activities. Preclinical studies suggest that extracts of *R. dumetorum* may improve glucose tolerance, enhance insulin sensitivity, and modulate carbohydrate-metabolizing enzymes. Its antioxidant properties further contribute to reducing oxidative stress, a key factor in diabetic complications. Although the plant demonstrates promising therapeutic efficacy, clinical validation, standardization of extracts, and mechanistic insights are still limited. Hence, R. dumetorum represents a potential phytotherapeutic agent for the development of safe and effective antidiabetic formulations.

Keywords: Randia dumetorum, diabetes mellitus, hypoglycemic activity, antioxidant, herbal medicine.

Biodegradable Polymeric Nanoparticles for Targeted Brain Drug Delivery

Aditi Kumari

R.V. Northland Institute

Corresponding author: aditikumari1414@gmail.com

Abstract

The blood-brain barrier (BBB) protects the brain but limits the delivery of most drugs but limits the delivery of most drugs, making treatment of central nervous system (CNS) Disorders challenging. Biodegradable polymeric nanoparticle offers a promising approach to overcome this barrier by delivering drugs directly to the brain in a targeted and controlled manner. Polymers like PLGA, Chitosan, and polycaprolactone are biocompatible and safety degrade into non- toxic products. These nanoparticles can be functionalized with ligands such as transferrin or peptides to enhance receptor-mediated transport across the BBB. This approach controlled and sustained drug release, reduces systemic side effects, and increase therapeutic efficacy. Potential applications include treatment of neurodegenerative diseases, brain tumors, and CNS infections. Future development may include stimuli-responsive nanoparticles represent a safe and efficient strategy to improve drug delivery to the brain, offering new hope for the treatment of various CNS disorders.

Keywords: blood-brain barrier (BBB), central nervous system (CNS), polymeric nanoparticles.

Hepatoprotective Effects of Achyranthes aspera Extracts Against Monosodium Glutamate-Induced Toxicity in Rats

Ritu Jaiswal and Veena B. Kushwaha

Department of Zoology, DDU Gorakhpur University, Gorakhpur-273009, Uttar Pradesh

Corresponding author: rituj3666@gmail.com

Abstract

Monosodium glutamate (MSG) is a glutamate-rich compound that imparts umami flavour to food. It occurs naturally in vegetables (spinach, peas, onions, tomatoes), as well as in meat, milk, cheese, and mushrooms. However, the excessive use of synthetic MSG as a flavour enhancer in food preparations has raised health concerns, as it has been associated with conditions such as obesity, diabetes mellitus, hepatotoxicity, kidney failure, and cardiovascular diseases.

Achyranthes aspera, an herb belonging to the family *Amaranthaceae*, commonly grows as a roadside and field weed. It is rich in metabolites such as alkaloids, flavonoids, tannins, and coumarins, which are known for their diverse biological properties, including antioxidative, hepatoprotective, anti-inflammatory, and anticancer activities.

This study investigates the hepatoprotective effect of *A. aspera* extracts in mitigating MSG-induced hepatotoxicity in rats. Oral administration of MSG at a dose of 400 mg/kg body weight/day for 28 days led to significant increase in serum levels of alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), and cholesterol, in comparison to the control group. These elevations indicate liver damage, as increased enzyme activity in blood reflects leakage from disrupted hepatocyte membranes. The rise in cholesterol may be attributed to impaired metabolic pathways, possibly due to oxidative stress and reactive oxygen species (ROS) generated by MSG exposure.

When MSG-exposed rats were treated with ethanolic and aqueous extracts of whole-plant *A. aspera* (400 mg/kg body weight/day) along with MSG (400 mg//kg body weight/day) for 28 days, the elevated ALT, AST, ALP, and cholesterol levels were normalized, reflecting a reversal of MSG-induced hepatotoxicity. This demonstrates the hepatoprotective effect of *A. aspera* extracts, likely to be mediated by their antioxidant activity, which helps counteract ROS-induced hepatic damage.

Keywords: Monosodium Glutamate, *Achyranthes aspera*, alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), cholesterol.

AGREE - Analytical GREEnness Metric Approach and Software

Vaidehi Hiwarkar[1]*, Kinjal Bera[2]

[1]PG Scholar, Department of Pharmaceutical Quality Assurance, Parul Institute of Pharmacy, Parul University, Vadodara- 391760, Gujarat, India

[2]Assosiate Professor, Department of Pharmaceutical Quality Pharmacognosy, Parul Institute of Pharmacy, Parul University, Vadodara- 391760, Gujarat, India

Corresponding author: vaidehihiwarkar18@gmail.com

Abstract

Drugs must be tested to ensure their quality, effectiveness, and efficiency. However, harmful chemicals, solvents, and irreversible processes are typically used in analytical techniques, which may be harmful to humans or the environment and produce large amounts of waste, these problems are being increasingly resolved as a less sustainable and sustainable alternative. Analytical GREEnness Metric (AGREE) software provides a comprehensive and user-friendly tool for assessing the environmental sustainability of analytical methods. Based on the 12 principles of Green Analytical Chemistry, AGREE translates qualitative concepts into a visual, quantitative, and holistic score ranging from 0 (least green) to 1 (most green) and adopt energy-efficient equipment and smaller techniques. Recent advancements include the use of ethanol-water in high-performance liquid chromatography instead of acetonitrile and the creation of a direct analytical method that does not require significant sample preparation. Artificial intelligence add-ons for automation and digital optimisation software are also increasing efficiency in terms of cost and resource conservation. This would be restricted by problems including technology, regulatory acceptance, and the absence of a clear tool to measure sustainability. Considering the usefulness of sources like AGREE and GAPI, global standards still exist. In the future, the industry will continue to develop to provide more affordable testing technique solutions through the use of solvent-free platforms, nanomaterial sensitisation, and artificial intelligence optimisation. Green chemistry principles are the only way for the pharmaceutical sector to associate precision, safety, and environmental responsibility, which will ultimately contribute to a more sustainable healthcare system.

Keywords: Analytical GREEnness Metric, Green Analytical Chemistry, nanomaterial sensitisation, artificial intelligence optimisation.

Enhancing Evidence-Based Decision Making for Sustainable Healthcare *via* Health Technology Assessment

Anzarul Haque[1*], Shahida Parveen[2], Ajaz Ahmad[3]

[1]Central Laboratories Unit, Qatar University, 2713, Doha, Qatar

[2]Department of Nursing, College of Pharmacy and Applied Medical Sciences, Dar Al Uloom University, Riyadh, Saudi Arabia

[3]Department of Clinical Pharmacy, College of Pharmacy, King Saud University, 11451 Riyadh, Saudi Arabia

Corresponding author: Anzarul.h@qu.edu.qa

Abstract

Health technology encompasses a broad spectrum of interventions, including pharmaceuticals, vaccines, devices, medical and surgical procedures, and organizational systems designed to protect and maintain health. These technologies form the backbone of prevention, diagnosis, treatment, and rehabilitation across healthcare systems. The increasing complexity and cost of such innovations necessitate structured evaluation through Health Technology Assessment (HTA). HTA is a multidisciplinary, systematic process that examines the clinical, economic, ethical, and social implications of health technologies to guide evidence-based decision-making. Its orientations can be technology-specific, problem-oriented, or project-based, addressing diverse needs ranging from regulatory approval and institutional acquisition to patient-centered clinical guidelines. The primary objectives of HTA include informing policymakers, clinicians, payers, and healthcare organizations about the safety, effectiveness, and cost-effectiveness of technologies, while ensuring equitable access and sustainability of health systems. Programs such as the Health Technology Assessment Program (HTAP) have demonstrated success in promoting safer, more consistent, and transparent decisions through reliance on scientific evidence and stakeholder engagement. Expertise in HTA spans multiple disciplines, from clinicians and biomedical engineers to economists, ethicists, and decision scientists, highlighting the comprehensive nature of the process. Ultimately, integrating HTA into health policy and practice strengthens healthcare delivery by balancing innovation with accountability. It ensures that limited resources are allocated to interventions with proven value, thereby improving patient outcomes and supporting public health goals. This presentation highlights the essential role of HTA in shaping rational health technology use and advancing sustainable, evidence-driven healthcare systems.

Keywords: Health Technology, HTA, Evidence-Based Decision Making, Healthcare Policy, Cost-effectiveness.

Advances in Cancer Immunotherapy and the Pharmacist's Role

Vaibhavi Valmik, Mirza Sahar Fatema A, Prajapati Dhruvi Manojkumar*

L. B. Rao Institute of Pharmaceutical Education and Research, Khambhat, Anand

Corresponding author: dhruviprajapati3092006@gmail.com

Abstract

Immunotherapy is an innovative treatment that activates the immune system to target diseased cells, offering better specificity and reduced toxicity compared to conventional therapies. To summarize the therapeutic advantages of immunotherapy in modern healthcare. To highlight the pharmacist's role in ensuring safe and effective application of immunotherapy. Literature review on therapeutic benefits and pharmacist contributions. Immunotherapy improves survival, quality of life, and provides durable responses. Pharmacists ensure safe use through patient counselling, adverse effect monitoring, drug interaction prevention, and therapy optimization. Immunotherapy is a promising advance in modern therapy. Pharmacists play a vital role in maximizing its safety, efficacy, and accessibility.

Keywords: Immunotherapy, cancer, pharmacist role, Toxicity, Treatment.

Smart and Stimuli-Responsive Drug Delivery Systems: A Next-Generation Approach in Pharmaceutics

Shaba Saifi*, Dr. Sanjar Alam

R.V. Northland Institute

Corresponding author: shabasaifi37@gmail.com

Abstract

Smart and stimuli-responsive drug delivery systems represent a new paradigm in modern pharmaceutics, aiming to overcome the limitations of conventional dosage forms. These systems are designed to respond to specific internal or external triggers, enabling site-specific and controlled drug release. Internal stimuli include pH variations, temperature gradients, enzymatic activity, and redox conditions, whereas external triggers involve magnetic fields, ultrasound, light, and electrical signals. By utilizing these stimuli, drug release can be finely tuned to occur only at the desired site, thereby reducing systemic side effects and improving therapeutic outcomes.

Examples of such systems include pH-sensitive nanoparticles for tumor or colon-specific delivery, temperature-responsive in-situ gels for ocular and injectable applications, enzyme-degradable nanocarriers for colon-targeted therapy, and redox-sensitive systems for intracellular drug release. Multi-stimuli-responsive systems that combine two or more triggers, such as pH–temperature or enzyme–light, further enhance precision and adaptability, especially in complex diseases like cancer, inflammation, and neurological disorders. In addition to targeted delivery, these platforms improve bioavailability, reduce dosing frequency, and enhance patient compliance. With the integration of nanotechnology, biomaterials, and molecular engineering, smart and stimuli-responsive systems hold significant promise in revolutionizing personalized and precision medicine.

Keywords: Stimuli-responsive systems, pH-sensitive, In-situ gels, Enzyme-responsive carriers, Redox-sensitive nanocarriers, Precision pharmaceutics.

Synthesis, Characterization and Antidepressant Studies On Novel Piperazine-Tethered Naphthalene Compounds

Shruti Saraf *

LNCT University, Bhopal J.K. Town Sarvardharm C-Sector, Kolar Road, Bhopal-462042, M.P.

Corresponding author: shrutisaraf@06gmail.com

Abstract

Depression is a mood disorder that causes a persistent feeling of sadness and loss of interest. It can be classified as Disruptive mood dysregulation disorder; Major depressive disorder; Persistent depressive disorder (dysthymia), Premenstrual dysphoric disorder; and Depressive disorder due to another medical condition. All these are characterized by emptiness, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function.

Depressive disorders affect 3.8% of the world population accounting to about 280 million individuals with 5.0% adults and 5.7% adults older than 60 years of age. At its worst, depression can lead to suicide and suicide accounts for about 7 lac deaths every year and is the fourth leading cause of deaths in people of 15-29 years of age.

Antidepressant drugs used in therapy provide symptomatic relief and may occasionally cause abuse and dependency. Hence, a continuous endeavor is required to have newer and more effective therapeutic agents that might act as antidepressants.

Heterocyclic rings have been at the center stage of drug research since decades and one such heterocycle viz. piperazine is an essential scaffold/substitution in several clinically approved antidepressants. Fused cyclic nucleuses (either carbocyclic or heterocyclic) have also been an interesting feature in the antidepressant molecules

Keywords: Piperazine, Antidepressant drugs, antioxidant, naphthalene.

Synthesis, Characterization and Anti-Inflammatory Study Of N-Substituted Phenyl Azetidin-2-One Derivatives

Vikash Agnihotri*

LNCT University, Bhopal J.K. Town Sarvardharm C-Sector, Kolar Road, Bhopal-462042, M.P.

Corresponding author: agnihotri@9312gmail.com

Abstract

Inflammation is a normal physiological response that causes injured tissue to heal. An inflammatory process starts when chemicals are released by the damaged tissue. In chronic inflammation, the inflammatory process may begin even if there is no injury, and it does not end when it should. Chronic inflammation may be caused by infections that don't go away, abnormal immune reactions to normal tissues, or conditions such as obesity. Over time, chronic inflammation can cause DNA damage and lead to cancer. Chronic inflammatory diseases have been recognized as the most significant cause of death in the world today, with more than 50% of all deaths being attributable to inflammation-related diseases such as ischemic heart disease, stroke, cancer, diabetes mellitus, chronic kidney disease, non-alcoholic fatty liver disease (NAFLD) and auto-immune and neurodegenerative conditions. Depending on the degree and extent of the inflammatory response, including whether it is systemic or local, metabolic and neuro endocrine changes can occur to conserve metabolic energy and allocate more nutrients to the activated immune system. A normal inflammatory response is characterized by the temporally restricted up regulation of inflammatory activity that occurs when a threat is present and that resolves once the threat has passed. However, the presence of certain social, psychological, environmental and biological factors has been linked to the prevention of resolution of acute inflammation and, in turn, the promotion of a state of low-grade, non-infective (that is, 'sterile') systemic chronic inflammation (SCI) that is characterized by the activation of immune components that are often distinct from those engaged during an acute immune response.

Keywords: Azetidinone, anti-oxidant, ADMET, synthesis, inflammation.

Rising Prevalence of Psychiatric Disorders: Challenges and Future Perspectives

Aditya Vishal*, Nitya Sharma, Ramji Gupta, Sanjar Alam

R.V. Northland Institute, Dadri, Greater Noida (203207)

Corresponding author: adityavishal123456@gmail.com

Abstract

Psychiatric disorders, including depression, anxiety, bipolar disorder, schizophrenia, and substance use disorders, represent a major global health burden. Over the past decades, their prevalence has significantly increased, affecting individuals across all age groups and socioeconomic backgrounds. This rise is influenced by multiple factors such as rapid urbanization, lifestyle changes, chronic stress, genetic predisposition, and social determinants like unemployment, poverty, and limited access to healthcare. Depression and anxiety remain the most commonly reported conditions, with the World Health Organization estimating that more than 1 in 8 people worldwide live with a mental health disorder. The COVID-19 pandemic further amplified psychological distress, leading to a higher incidence of anxiety, depression, and post-traumatic stress, particularly among vulnerable populations. Psychiatric disorders not only impair quality of life but also contribute to increased morbidity, disability, and mortality through suicide and comorbidities like cardiovascular disease and diabetes. Despite growing awareness, gaps in diagnosis, stigma, and inadequate mental health resources remain critical barriers to effective management. Addressing the rising prevalence requires early detection, community-based interventions, integration of mental health into primary care, and development of novel therapeutic approaches, ensuring holistic care and reducing the global burden of psychiatric disorders.

Keywords: Psychiatric Disorders, Depression, Anxiety, Mental Health, Prevalence, Risk Factors, Stigma, Public Health, Therapeutic Strategies.

Epilepsy: Pathophysiology, Current Therapies, And Emerging Approaches

Aryan Kumar*, Nitya Sharma, Ramji Gupta, Sanjar Alam

R.V. Northland Institute, Dadri, Greater Noida (203207)

Corresponding author: drxaryan0003@gmail.com

Abstract

Epilepsy is a chronic neurological disorder characterized by recurrent, unprovoked seizures resulting from abnormal and excessive neuronal activity in the brain. It affects nearly 50 million people worldwide and remains one of the most common neurological conditions across all age groups. The underlying causes of epilepsy are diverse, including genetic mutations, structural brain lesions, trauma, infections, and metabolic disturbances. Seizures occur due to an imbalance between excitatory and inhibitory neurotransmission, primarily involving excess glutamate activity and reduced GABAergic inhibition. Additional mechanisms such as oxidative stress, neuroinflammation, ion channel dysfunction, and altered synaptic plasticity also contribute to epileptogenesis and seizure recurrence. Current treatment relies mainly on antiepileptic drugs (AEDs), which target sodium, calcium, and potassium channels or modulate GABA and glutamate pathways. While effective in many patients, nearly one-third of individuals remain resistant to drug therapy. Surgical interventions, vagus nerve stimulation, ketogenic diet, and deep-brain stimulation are alternative approaches for refractory cases. Emerging therapies focus on novel targets, including anti-inflammatory agents, antioxidants, gene therapy, and herbal compounds with neuroprotective potential. Experimental studies in animal models are providing important insights into these mechanisms. These abstract highlights the pathophysiology, therapeutic strategies, and future directions in epilepsy management, emphasizing the need for multi-target approaches to improve outcomes in drug-resistant patients.

Keywords: Epilepsy, Seizures, Antiepileptic Drugs, Neurotransmitters, GABA, Glutamate, Ion Channels, Neuroinflammation, Drug Resistance, Emerging Therapies.

Development of a Novel HPLC-UV Method for Estimation of Desidustat in Human Plasma: A Proposed Study

Gauri Anil Vispute

Parul Institute of Pharmacy

Corresponding author: visputegauri49@gmail.com

Abstract

Desidustat is a new hypoxia-inducible factor prolyl hydroxylase (HIF-PH) inhibitor that has shown promise as a therapy for anemia secondary to chronic kidney disease. Despite the importance of Desidustat, there are no reports of plasma drug concentrations using any HPLC-UV methods. The proposed study plans to develop a simple, sensitive, validated HPLC method for Desidustat in human plasma samples. The proposed method will include protein precipitation for sample preparation, separation via a C18 column with optimized acetonitrile–buffer mobile phase, and UV detection. The method will be validated following USFDA bioanalytical methodology guidelines which include testing for linearity, accuracy, precision, recovery, and stability. Overall aims of this project will provide a simple cost-effective tool that can be used for pharmacokinetic studies and therapeutic drug monitoring applications in human plasma for Desidustat filling a current analytical gap.

Keywords: Desidustat, HPLC, plasma, bioanalytical method, validation.

mRNA Therapeutics Beyond COVID-19: Opportunities and Challenges

J. Kalyan[1*], Shaik Shakir Basha[1]

*[1]Department of Pharmacy, Raghavendra Institute of Pharmaceutical Education and Research,

K. R. Palli Cross, Chiyyedu Post, Anantapur-515721, Andhra Pradesh, India,

[1] Associate Professor, Department of Pharmaceutical Analysis, Raghavendra Institute of Pharmaceutical Education and Research, K. R. Palli Cross, Chiyyedu Post, Anantapur- 515721, Andhra Pradesh, India

Corresponding author: jkalyan9346@gmail.com

Abstract

The unprecedented success of mRNA vaccines against COVID-19 has transformed global healthcare and highlighted the immense potential of mRNA-based therapeutics. Beyond infectious diseases, mRNA technology is now being explored for applications in oncology, cardiovascular disorders, rare genetic diseases, and autoimmune conditions. The core advantage of mRNA therapeutics lies in their ability to encode virtually any protein, enabling rapid, scalable, and personalized treatment approaches. Unlike conventional therapies, mRNA drugs are non-integrating, transient, and can be manufactured efficiently, making them highly adaptable to emerging medical needs. Current advances focus on developing cancer vaccines, protein replacement therapies, and mRNA-based gene editing tools such as CRISPR-Cas systems. Lipid nanoparticles (LNPs) and novel delivery platforms have further enhanced stability and tissue-specific targeting. However, several challenges remain, including mRNA instability, immunogenicity, cold-chain requirements, and high production costs. Additionally, long-term safety data and regulatory frameworks are still evolving. In India, the integration of mRNA therapeutics could address unmet medical needs, particularly in cancer care and rare diseases, provided investments in research, infrastructure, and policy support are strengthened. Overall, mRNA therapeutics represent a paradigm shift, offering transformative opportunities while presenting challenges that demand innovative solutions.

Keywords: mRNA therapeutics, drug delivery, cancer vaccines, genetic disorders, lipid nanoparticles.

Intranasal Polymeric Nanoparticles for Brain Targeting of Rivastigmine in the Treatment of Alzheimer's Disease

Lalit*, Rajeev, Mohammad Rashid, Sanjar Alam*

R.V. Northland Institute, Dadri, Uttar Pradesh

Corresponding author: choudhuryanshul12@gmail.com

Abstract

Alzheimer's disease (AD) is a progressive neurodegenerative disorder marked by cognitive decline and memory impairment. One of the major challenges in AD therapy is the limited ability of drugs to cross the blood–brain barrier (BBB). Rivastigmine, a cholinesterase inhibitor widely used for symptomatic management, suffers from poor brain bioavailability when administered orally, leading to suboptimal therapeutic efficacy. The present study aimed to develop and evaluate intranasal polymeric nanoparticles as a novel, non-invasive drug delivery strategy for efficient brain targeting of rivastigmine. Polymeric nanoparticles were prepared by a modified nanoprecipitation–solvent evaporation technique using poly (lactic-co-glycolic acid) (PLGA) and stabilized with polyvinyl alcohol (PVA). The formulations were characterized for particle size, zeta potential, polydispersity index (PDI), encapsulation efficiency, and drug loading. Optimized nanoparticles were further evaluated through in vitro drug release and ex vivo permeation studies using sheep nasal mucosa to simulate intranasal administration. In vivo pharmacokinetic and pharmacodynamic studies in animal models compared the performance of the intranasal nanoparticles with an oral rivastigmine solution. The results demonstrated enhanced brain delivery, improved therapeutic efficacy, and better patient compliance potential with reduced systemic side effects. This novel intranasal nanoparticle system offers a promising approach for effective and patient-friendly management of Alzheimer's disease.

Keywords: Alzheimer's disease, Rivastigmine, Blood–brain barrier, Intranasal delivery, Polymeric nanoparticles, PLGA, Brain targeting, Neurodegenerative disorder.

Adverse Drug Reactions & Pharmacovigilance: Emerging Trends

Manish Bhardwaj*

Dharam Samaj College of Pharmacy, Aligarh (Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Lucknow, India

Corresponding author: manishbhardwajasr46@gmail.com

Abstract

Adverse Drug Reactions (ADRs) pose a significant challenge in modern healthcare, affecting patient safety and treatment outcomes. Pharmacovigilance (PV) plays a crucial role in detecting, assessing, and preventing ADRs, ensuring the safe use of medications. This poster highlights recent advancements in PV, including the integration of artificial intelligence (AI) and big data analytics in ADR detection, real-time monitoring through electronic health records (EHRs), and the role of social media as a tool for spontaneous reporting. Additionally, emerging trends such as patient-centered pharmacovigilance, the use of biosensors for real-time drug safety monitoring, and regulatory updates in PV systems are discussed. The impact of global harmonization initiatives, such as the WHO's Uppsala Monitoring Centre and the FDA's Sentinel Initiative, is also explored. With the increasing complexity of drug therapies, innovative PV approaches are essential for enhancing medication safety and reducing healthcare burdens.

Keywords: Adverse Drug Reactions, Pharmacovigilance, Artificial Intelligence, Big Data, Patient Safety, Drug Monitoring.

Congestive Heart Failure: Pathophysiology, Current Management, And Emerging Therapies

Mukesh Kumar*, Nitya Sharma, Ramji Gupta, Sanjar Alam

R.V. Northland Institute, Dadri, Greater Noida (203207)

Corresponding author: mukeshkori7428@gmail.com

Abstract

Congestive Heart Failure (CHF) is a progressive clinical syndrome characterized by the heart's inability to pump sufficient blood to meet the metabolic demands of the body. It remains a leading cause of morbidity and mortality worldwide, with rising prevalence due to aging populations, hypertension, diabetes, and ischemic heart disease. CHF is classified into two major types: heart failure with reduced ejection fraction (HFrEF) and heart failure with preserved ejection fraction (HFpEF), each involving distinct mechanisms but leading to impaired cardiac output and fluid overload. The underlying pathophysiology involves neurohormonal dysregulation, including overactivation of the renin–angiotensin–aldosterone system (RAAS) and sympathetic nervous system, along with inflammation, oxidative stress, and structural remodeling of the myocardium. These mechanisms contribute to ventricular hypertrophy, fibrosis, and progressive decline in cardiac function. Current treatment strategies include ACE inhibitors, beta-blockers, ARNI, aldosterone antagonists, diuretics, and SGLT2 inhibitors, which improve symptoms, slow disease progression, and enhance survival. Device-based therapies such as cardiac resynchronization therapy, implantable cardioverter-defibrillators, and left ventricular assist devices further support patients with advanced disease. Despite these advances, CHF remains a major global health burden, highlighting the urgent need for novel therapies. Emerging research explores regenerative medicine, gene therapy, anti-inflammatory agents, and natural products with cardioprotective potential. These abstract outlines the pathophysiological mechanisms, therapeutic targets, and evolving treatment approaches, emphasizing the importance of integrated and personalized strategies for CHF management.

Keywords: Congestive Heart Failure, HFrEF, HFpEF, RAAS, Sympathetic Nervous System, Cardiac Remodeling, Oxidative Stress, Cardioprotective Therapies, SGLT2 Inhibitors, Emerging Strategies.

Transdermal Delivery of Repaglinide: A Novel Approach for Type 2 Diabetes Management

Narendra Kumar Gautam*, Yatendra Kumar, Mohammad Rashid, Sanjar Alam

R.V. Northland Institute, Dadri, Uttar Pradesh

Corresponding author: narendrakr.gautam@gmail.com

Abstract

This study is focused on the design, development, and evaluation of a transdermal patch of Repaglinide aimed at achieving sustained drug release and improved therapeutic efficacy in the management of Type 2 Diabetes Mellitus (T2DM). Repaglinide, a short-acting oral hypoglycaemic agent, often requires multiple daily doses due to its limited half-life, which can reduce patient compliance and increase the risk of fluctuations in blood glucose levels. To overcome these challenges, a transdermal patch will be prepared using suitable polymers and plasticizers through the solvent casting method. The prepared patches will be systematically evaluated for their physicochemical properties, such as thickness, tensile strength, folding endurance, and drug content uniformity, to ensure formulation consistency and quality. In-vitro drug release studies and ex-vivo skin permeation experiments will be carried out to determine the release kinetics and permeability profile of the drug through the skin barrier. Additionally, stability studies following ICH guidelines will be performed to confirm the formulation's durability and shelf life under various storage conditions. The proposed transdermal delivery system has the potential to enhance the bioavailability of Repaglinide, reduce dosing frequency, and minimize gastrointestinal side effects, thereby improving patient adherence and overall therapeutic outcomes in T2DM management.

Keywords: Transdermal patch, Type 2 Diabetes Mellitus (T2DM), Sustained release, Bioavailability.

Molecular Targets and Pathways in Diabetes: Opportunities for Therapeutic Intervention

Nitya Sharma*, Ramji Gupta, Sunaina Sharma, Sanjar Alam

R.V. Northland Institute, Dadri, Greater Noida (203207)

Corresponding author: nityasharma789@gmail.com

Abstract

Diabetes mellitus is a chronic metabolic disorder marked by persistent hyperglycemia due to impaired insulin secretion, insulin resistance, or both. Its complex pathophysiology involves multiple molecular pathways, offering diverse therapeutic targets. The insulin signaling pathway (PI3K/Akt, GLUT4 translocation) regulates glucose uptake and is impaired in insulin resistance. The AMPK pathway improves energy balance and insulin sensitivity, while the mTOR pathway influences β-cell growth and insulin action. The PPARγ pathway modulates lipid metabolism and enhances insulin responsiveness. Other key mechanisms include the incretin pathway (GLP-1, DPP-4 inhibitors) that supports insulin secretion, and the SGLT2 pathway that controls renal glucose reabsorption. Additionally, chronic inflammation mediated by NF-κB and MAPK pathways and oxidative stress regulated by the Nrf2 pathway contribute significantly to diabetic complications. Targeting these pathways with pharmacological agents and herbal interventions shows promise in improving glycemic control, preserving β-cell function, and preventing complications. Multitarget strategies are emerging as effective options to address the multifactorial nature of diabetes. This abstract highlight major pathways and molecular targets in diabetes, emphasizing their role in pathogenesis and therapeutic potential.

Keywords: Diabetes, Insulin Resistance, PI3K/Akt, AMPK, mTOR, PPARγ, Incretin, SGLT2, NF-κB, Nrf2, Oxidative Stress, Multitarget Therapy.

A Comprehensive Review of the Pharmacological and Phytochemical and Nutraceutical Profiles of Eugenol Derivatives as Potential Agents.

Shaikh Rizwan Naushad[1*], Karthik.R[2]

Rajiv Gandhi University of Health Sciences

Corresponding author: rizwanshaikh1790@gmail.com

Abstract

Eugenol a naturally present compound primarily found in cloveoil and its derivatives possess a diverse range of pharmacological properties makes them valuable in various applications. This systemic eview examines the multidisciplinary uses of eugenol and its derivatives, like Methyl Eugenol (4-Allyl-1,2-dimethoxybenzene), Acetyl Eugenol (4-Allyl-2-methoxyphenyl acetate), 3. Isoeugenol (4-Propenyl-2-methoxyphenol) etc., highlighting their potential across pharmaceutical, nutraceutical, cosmetical and industrial applications. Eugenol possesses remarkable analgesic, antispasmodic, anticancer, anti-inflammatory, antioxidant, cardioprotective, neuroprotective, hepatoprotective and immunomodulatory effects. Eugenol (1-hydroxy-2-methoxy-4-allylbenzene) is a phenolic compound; the natural sources are clove, basil, and cinnamon. To extract eugenol from a natural source, many methods are practiced globally. The primary mechanisms involved in its therapeutic effects are free radical scavenging activity, blocking the generation of reactive oxygen species, inhibiting the production of reactive nitrogen species, enhancing cytoantioxidant potential, and disrupting DNA and proteins. Nutraceuticals impart many benefits in treating chronic diseases such as diabetes, obesity, cardiovascular conditions, and cancer. Nutraceuticals are available as food supplements, functional food, and medicinal food. The product's efficacy relied upon bioavailability, making this product effective by using a suitable carrier. The motive of using a carrier was to protect the encapsulated molecule from external conditions, preserve functionality, and deliver effectively to the target site. It is free from unwanted effects and is cheaper because it is obtained from a natural source.

Keywords: Nutraceuticals, Eugenol, antispasmodic, anticancer, anti-inflammatory, antioxidant, cardioprotective, neuroprotective, hepatoprotective, immunomodulatory.

Regulatory aspects of processed excipients

Ankit Chaudhary*, Arsh Chanana

NIMS Institute of Pharmacy, NIMS University, Rajasthan, Jaipur

Corresponding author: Ankit2004chaudhary@gmail.com

Abstract

Substances added to a medication that are not the active component or ingredients are known as excipients. product to aid in its formulation, stability, bioavailability, and patient acceptability. Excipients are regulated by evaluating their safety and effectiveness as well as how they affect the drug product's quality, stability, and bioavailability. For example, the Inactive Ingredient Database (IID), a list of approved excipients issued by the FDA, contains details about each excipient's composition, purpose, and safety. In order to guarantee that the excipient is consistently of the necessary quality and is not contaminated, the FDA additionally mandates that excipients be produced in compliance utilizing the most recent Good Manufacturing Practices (cGMP) requirements. The possibility for toxicity, mutagenicity, and adverse consequences is assessed for excipients. To guarantee the secure application of excipients, the EMA additionally mandates that they be prepared in compliance with cGMP criteria and appropriately labelled. Regulatory bodies contribute to the security and efficiency of pharmaceutical products for patients by establishing criteria and recommendations for the production and use of excipients. This study reviews the safety and efficacy of processed excipients, their impact on pharmaceutical products' quality, stability, and bioavailability, and the policies and procedures used by regulatory agencies to ensure these aspects. The FDA's Inactive Ingredient Database (IID), cGMP rules, and the EMA's safety and compatibility evaluations are discussed. In order to guarantee patient safety and efficacy, regulatory bodies play a critical role in making sure that the excipients used in pharmaceutical goods are of the highest caliber, safe, and efficient.

Keywords : Co-processed excipients , physical mixtures, established excipients.

Formulation, characterization, and evaluation of diclofenac sodium nanoparticles for improved drug delivery, enhanced therapeutic efficacy, and controlled release systems

Shivangi*

Metro College of Health Science and Research

Corresponding authors: shivangi29920@gmail.com

Abstract

Diclofenac sodium is a widely prescribed nonsteroidal anti-inflammatory drug (NSAID) for the treatment of pain, inflammation, and rheumatic disorders. However, its conventional oral and topical formulations suffer from poor solubility, gastrointestinal irritation, rapid metabolism, and short half-life, which limit its therapeutic efficiency. Nanoparticle-based drug delivery systems have emerged as an innovative solution to overcome these limitations by enhancing solubility, prolonging circulation time, and enabling targeted delivery. Nanoparticles such as liposomes, niosomes, solid lipid nanoparticles (SLNs), polymeric nanoparticles, and nanogels have been successfully employed for the formulation of diclofenac sodium. This project aims to explore the formulation, characterization, and evaluation of diclofenac sodium nanoparticles. The study emphasizes different preparation techniques, including solvent evaporation, nanoprecipitation, emulsification, and lipid-based systems. Characterization parameters such as particle size, polydispersity index (PDI), zeta potential, encapsulation efficiency, drug loading, and in vitro release kinetics are discussed. The therapeutic applications of diclofenac sodium nanoparticles in sustained drug release, transdermal delivery, and targeted action against inflammatory diseases are analyzed. The project also highlights in vivo studies, clinical significance, and regulatory aspects of nanoparticle formulations. Advantages such as reduced dose frequency, improved patient compliance, enhanced bioavailability, and minimized side effects are emphasized. Despite challenges such as scale-up issues, stability concerns, and cost of production, nanoparticle formulations of diclofenac sodium hold great promise in improving therapeutic outcomes. This work provides an in-depth understanding of the principles, strategies, and future scope of nanoparticle-based drug delivery of diclofenac sodium.

Keywords: nonsteroidal anti-inflammatory drug (NSAID), solid lipid nanoparticles (SLNs), polymeric nanoparticles, nanogels.

Nanostructured Lipid Carriers: A Promising Drug Carrier for Targeted Cancer Therapy

Sudeshna Das*, Dr. Nayyar Parvez

School Of Pharmacy, Sharda University, Greater Noida

Corresponding author: sudeshnadas802@gmail.com

Abstract

Cancer is still a major cause of morbidity and mortality globally, and most therapies are hindered by drug-poor solubility, systemic toxicity, and multidrug resistance. The second generation of lipid-based nanoparticles, the Nanostructured Lipid Carriers (NLCs), has been depicted as the new hope of drug delivery systems to bypass these constraints. NLCs consist of a mixture of solid and liquid lipids stabilized with surfactants, which allows for high drug loading, enhanced stability, and controlled release of anticancer drugs. Their nanoscale dimensions allow for passive targeting through the enhanced permeability and retention effect, as well as active targeting by the modification of the surface with ligands to target tumor-specific receptors. NLCs have been extensively investigated for the delivery of chemotherapeutic drugs like paclitaxel, doxorubicin, and curcumin, with improved bioavailability, decreased toxicity, and improved therapeutic effects. NLCs also possess the potential to transcend biological barriers, such as the blood–brain barrier, and therefore are applicable for brain tumor therapy. Despite limitations regarding mass production and long-term stability, NLC-based formulations possess tremendous promise for personalized and combination therapy in oncology. In general, NLCs are a flexible and efficient platform in contemporary cancer nanomedicine.

Keywords: Nanostructured Lipid Carriers, Cancer Therapy, Drug Delivery, Targeted Therapy, Bioavailability, Chemotherapy, Nanomedicine.

Evaluation of the Gastroprotective Effect of *Mimosa pudica* Root Extract Against Aspirin-Induced Gastric Ulcers in Albino Wistar Rats

Priyanka Bhandari*

SGRR University

Corresponding author: priyankabhandari555@gmail.com

Abstract

Background: Gastric ulcer disease is a prevalent gastrointestinal tract disorder primarily resulting from an imbalance between gastric mucosal defensive mechanisms and aggressive factors like gastric acid, reactive oxygen species (ROS), and non-steroidal anti-inflammatory drugs (NSAIDs) such as aspirin. Although standard treatments such as proton pump inhibitors and H2-receptor antagonists are effective, their long-term use is associated with adverse effects, prompting the exploration of alternative therapies. This study investigates the anti-ulcer and antioxidant efficacy of *Mimosa pudica* in a rat model of aspirin-induced peptic ulcer and compares its therapeutic potential with Omeprazole, a standard anti-ulcer agent.

Methods: Aspirin (200 mg/kg orally) was administered to induce gastric ulcers in adult Albino Wistar rats. The rats were then treated with ethanolic root extract of *Mimosa pudica* at doses of 100 mg/kg and 200 mg/kg for about 7 days. Omeprazole (20 mg/kg) was used as a standard control. Evaluations included ulcer scoring, ulcer index, measurement of gastric pH and acidity,ulcer protection and histological examination of gastric tissue.

Results: Administration of *Mimosa pudica* root extract led to a significant, dose-dependent reduction in ulcer severity compared to untreated control group ($p<0.05$). The extract also helped normalize gastric acidity and pH, suggesting a protective effect on the stomach lining. Histological observations confirmed a reduction in mucosal damage and improved tissue integrity in treated groups.

Conclusion: These results indicate that *Mimosa pudica* root extract exhibits considerable gastroprotective activity, supporting its potential as a natural therapeutic agent for aspirin-induced gastric ulcers.

Keywords: *Mimosa pudica*, Gastric ulcer, Root extract, Aspirin, Albino Wistar rats, Gastroprotection.

Development, formulation, Optimization and Evaluation of *Terminalia Myriocarpa* leaf extract topical gel against DNCB-induced Atopic Dermatitis *in vivo* model

Dimple Sukhadev Shinde[1], Dr. Shweta Saboo[2]

[1]Department of Pharmacy, Government College of Pharmacy, Chhatrapati Sambhajinagar

[2]Department of Pharmacognosy, Government College of Pharmacy, Amravati.

Corresponding: shindedimple96@gmail.com

Abstract

Atopic dermatitis (AD) is a chronic inflammatory skin ailment characterized by pruritus, erythematous lesions, xerosis, and skin discomfort. Conventional therapies, i.e., corticosteroids, immunosuppressants, and biologics offer clinical benefits but are limited due to adverse effects, including susceptibility to infection, hepatic toxicity, and cardiovascular complications. In search of safer alternatives, the present work emphasized the therapeutic potential of three medicinal plant traditionally used by the Folkarine tribe of Manipur. *Terminalia Myriocarpa* extract were analyzed for TFC TPC, antioxidant activity through multiple *in vitro* assays (DPPH, ABTS, CUPRAC, FRAP, hydroxyl radical, nitric oxide, and sulfur dioxide scavenging), and antimicrobial activity with ZOI and MIC against different bacterial and fungal strains (*Bacillus subtilis, Candida albicans, Escherichia coli, Malassezia furfur, Pseudomonas aeruginosa, Serratia marcescens, Staphylococcus aureus*, and *Enterococcus faecalis*). In the present work, the bioactive fractions were profiled using TLC/HPTLC and subjected to molecular docking. Acute dermal toxicity (OECD 402) was employed to confirm safety. Topical gel, comprising 4% extracts, formulated employing QbD approach, were evaluated in a DNCB-induced AD mouse model. Extract demonstrated significant antioxidant and antimicrobial activities with therapeutic effects against atopic dermatitis.

Keywords: Atopic dermatitis (AD), pruritus, erythematous lesions, xerosis, and skin discomfort.

The Role of Al in Modern Healthcare Systems

Pallavi Dwivedi, Dr. Amit Kumar Singh

Department of Pharmaceutics, United Institutes of Pharmacy, Prayagraj, 211010 India.

Corresponding author: pallavidwivedi296@gmail.com

Abstract

Artificial Intelligence (AI) has emerged as a transformative force in modern healthcare, providing intelligent solutions that support learning, prediction, and decision-making across diverse medical domains. Its integration into healthcare is particularly evident in drug development, clinical research, and patient care. In the field of drug discovery, AI-driven models accelerate the identification of potential therapeutic compounds by screening large molecular libraries, predicting drug-target interactions, and evaluating safety profiles at early stages, thereby reducing both time and costs. Within clinical trials, AI plays a critical role in improving design and efficiency by analyzing vast and complex datasets, identifying biomarkers, optimizing patient recruitment, and predicting trial outcomes with higher accuracy. These capabilities enhance trial success rates and streamline the research process. For patient management, AI enables personalized medicine by supporting continuous health monitoring, early detection of diseases, and the development of tailored treatment plans based on individual patient data. This proactive approach not only improves treatment effectiveness but also enhances patient compliance and overall healthcare experiences. Collectively, these applications demonstrate how AI is reshaping healthcare by making processes faster, more precise, and patient-centered, highlighting its potential as a vital tool in the evolution of modern medicine.

Keywords: Artificial Intelligence (AI), Health care, Drug discovery, Clinical trials, Personalized medicine, Patient management, Predictive analytics, Machine learning, Decision support systems, Digital health.

Harnessing Functionalized Nano Lipid Carriers for Cardioprotection: Dual Drug Delivery in Focus for Precision Therapeutics

Neha Quadri, Research Scholar

Department of Pharmaceutics, School of Pharmaceutical Education and Research (SPER), Jamia Hamdard, New Delhi-110062, India

Corresponding author: nehaquadri1111913@gmail.com

Abstract

Cardiovascular diseases (CVDs) are the leading cause of death. In 2019, they killed 17.7 million individuals, and 85% of them died from heart attacks or strokes (WHO). CVDs kill one out of every four persons in the US, and they affect more than 30 million adults. NLCs are formed of both solid and liquid lipids, which form a stable matrix for holding drugs. This makes the medications easier to dissolve, more stable, and releases them at a steady rate. Changing the surface of NLCs with targeting ligands, for example, has made it possible to distribute medications just to cardiovascular tissues. This improves therapeutic outcomes and lowers off-target effects. NLCs are also safe for patients since they use lipid matrices that are both biocompatible and biodegradable. Because of this, they can be used for therapy. This review gives into further detail about different ways to administer two drugs at once, like dual drug-loaded NLCs, which act together to protect the heart better. Making individualized NLC-based medicines that are made just for each patient could transform the way we take care of our hearts and treat heart disease in a big way.

Keywords: Cardiovascular diseases (CVDs), heart attacks or strokes, NLCs.

Biochemical variations in patients with chronic kidney disease: A Comparative Study

Shaik Shafiya Begum*, Dr. Rishi Saraswat

Asst. Professor, Department of Pharmacy Practice, Chebrolu Hanumaiah Institute of Pharmaceutical Sciences, Chowdavaram, Guntur-19, Andhra Pradesh.

Associate Professor, School of Pharmacy, Raffles University, Rajasthan.

Corresponding author: shafiya.shaik1@gmail.com

Abstract

Chronic kidney disease (CKD) is a progressive condition characterized by declining kidney function, ranging from mild damage to end-stage renal disease. Its prevalence globally is estimated to be between 8 and 16%, with higher rates occurring in low- and middle-income regions. Underlying factors include diabetes, hypertension and genetic predisposition. The multifactorial nature of CKD is influenced by genetics, renal function monitoring, anemia, electrolyte imbalances and other risk factors. The present study collected 465 samples from subjects aged 18-65 years for a case-control study. These included 219 patients with CKD (101 females and 118 males; mean ages, 46.56 and 46.84 years, respectively) and 246 healthy individuals (131 women and 115 men; mean ages, 37.16 and 41.23 years, respectively). Whole blood was drawn for serum analysis for the purpose of comparing various biochemical parameters between patients with CKD and the healthy subjects, including total protein, albumin, ferritin, unsaturated iron binding capacity, iron, alkaline phosphatase (ALP), alanine aminotransferase (ALT), aspartate aminotransferase (AST), bilirubin, glucose, urea, serum creatinine, total calcium, free calcium, sodium, potassium, 8-hydroxy-2'-deoxyguanosine (8-OHdG) and phosphorus. The results obtained revealed a significant association between age and the occurrence of CKD ($P<0.001$), as well as between body mass index and the likelihood of developing CKD ($P=0.031$), indicating a connection between obesity and CKD. Biochemical analysis revealed disparities in several markers among patients with CKD, including glucose, urea, serum creatinine, iron, liver enzymes (ALP, AST and ALT), phosphorus, potassium, sodium, calcium and 8-OHdG ($P<0.05$). However, no notable differences in terms of sex were observed when comparing each sex group separately for the patients and controls. On the whole, the present study underscores the multifactorial nature of CKD, and its significant association with age.

Keywords: Chronic kidney disease, Biomarkers, Comorbidities.

NANOPARTICLE: Based Targeted Cancer Therapy: Bioinformatics Approaches

Ayush Keshri*, Sudeshna Das

School of Pharmacy, Sharda University, Greater Noida

Corresponding author: keshriayush572@gmail.com

Abstract

Nanoparticle-based targeted cancer therapy has emerged as a promising approach to improve treatment efficacy and reduce side effects. The most common type of cancer worldwide are lung, breast, and colorectal cancer, accounting for over 30% of all new cases. Lung Cancer is the leading causes of death, with 1.8 million deaths in 2022, followed by colorectal, liver, breast, and stomach cancers. Bioinformatics plays a crucial role in designing and optimizing nanoparticles for targeted cancer therapy. Nanoparticles can be engineered to target specific cancer cells, delivering therapeutic agents directly to the tumor site. Bioinformatics tools and techniques are essential for identifying cancer-specific biomarkers, designing nanoparticles, and predicting their behavior. This innovative approach employs various strategies, including target identification and validation (identifying specific cancer cell surface markers or receptors for targeted therapy), drug delivery optimization (modeling and stimulation of drug kinetics and biodistribution), nanoparticle cell interaction prediction (predicting interaction between nanoparticles and cancer cells). Nanoparticles have shown significant clinical benefits including targeted therapy, improved drug delivery (enhanced stability, drug solubility, bioavailability) enhanced imaging (MRI, CT, and optical imaging) personalized medicine, reduced toxicity. There are various applications for nanoparticles-based targeted cancer therapy like targeted chemotherapy, gene therapy, imaging and diagnostics. Nanoparticles have demonstrated encouraging outcomes and offers a viable stratergy for not only enhancing the quality of life but also dramatically boasting the overall survival rate of cancer patients.

Keywords: Bioinformatics, Bioavailability, Cancer-specific biomarkers, Designing nanoparticles, Nanoparticle.

Synthesis And Evaluation of Anticancer Potential of Novel Imino Derivatives

Yoghinni Manogaran[*,1], Neeraj Kumar Fuloria[1], Veerasamy Ravichandran[1], Sundram Karupiah[1], Venugopal Balakrishnan[2], Shivkanya Fuloria[1]

[1]Faculty of Pharmacy, AIMST University, Bedong 08100, Kedah, Malaysia

[2]Institute for Research in Molecular Medicine, Universiti Sains Malaysia,11800 USM, Pulau Pinang, Malaysia

Corresponding author: yoghinnimanogaran@gmail.com

Abstract

Background: Breast cancer remains one of the leading causes of cancer-related mortality among women. The safety concerns associated with commercially available chemotherapeutic agents continue to be a major challenge for researchers. Benzopyrans and imines are reported to exhibit significant anticancer potential.

Objective: The current study was aimed to synthesize, characterize, and evaluate the anticancer activity of novel imino derivatives (NID).

Materials and Methods: NID were synthesized through hydrazination of benzotetronic acid ester (1), followed by condensation with various aldehydes to yield NID4a–d. The structures of NIDs were confirmed using 1H-NMR, 13C-NMR, FTIR, and mass spectrometry. Biological evaluation included cytotoxicity assays against HEK-293 (normal) cells and anticancer activity against MCF-7 breast cancer cells using the MTT assay and an in vitro scratch assay.

Results and Discussion: Spectral data confirmed the successful synthesis of the NIDs. The appearance of IR signals at 2926 and 1698 cm^{-1} indicated C–H and C=O stretching, confirming ester functionalities in NID 2. The disappearance of the 2926 cm^{-1} band and the emergence of a new doublet at 3267 cm^{-1} confirmed N–H stretching in hydrazide (3). Similarly, loss of the 3267 cm^{-1} doublet with the appearance of bands between 1594–1582 cm^{-1} indicated C=N formation in NID 4a–d. In 1H-NMR, new signals at 9.33–9.35 ppm confirmed N=CH protons, while 13C-NMR signals at 151–152 ppm supported the presence of N=C. Mass spectra showed parent ion peaks consistent with expected molecular weights. Biological assays revealed that NID 4d demonstrated the strongest anticancer activity and safety profile compared with irinotecan.

Conclusion: Among all synthesized NIDs, 4d exhibited the highest anticancer potential and superior safety relative to irinotecan. The incorporation of an electron-donating p-methoxy group enhanced both cytotoxic selectivity and anticancer efficacy. Nonetheless, further preclinical and clinical investigations are necessary to validate their therapeutic significance.

Keywords: Cancer; Synthesis; Imino derivatives; Cytotoxicity.

Phytochemical Profiling of *Acalypha indica*: A Combined Approach Using Soxhlet Extraction and FTIR

Sanggetha Bala Krishnan[1*], Jeevandran Sundarasekar[1], Tew Hui Xian[1] Geethaa Sahgal[2]

[1]Faculty of Applied Science, AIMST University, Batu 3 1/2, Jalan, Bukit Air Nasi, 08100 Bedong,

Kedah

[2]Faculty of Pharmacy, AIMST University, Batu 3 1/2, Jalan, Bukit Air Nasi, 08100 Bedong, Kedah

Corresponding author: sanggethabalakrishnan@gmail.com

Abstract

Acalypha indica is a medicinal plant traditionally used in ethnomedicine. In this study, leaves of *A. indica* were extracted using Soxhlet extraction with 95% ethanol, yielding 12% dry extract. Preliminary phytochemical screening revealed the presence of alkaloids (positive in Dragendorff's and Wagner's tests), flavonoids, tannins, saponins, glycosides, steroids, terpenoids, phenols, reducing sugars, and carbohydrates, while anthraquinones and phlobatannins were absent. Fourier-transform infrared (FTIR) spectroscopy confirmed the presence of functional groups including halo compounds, ethers, alkenes, and polyphenols.

These functional groups show the structural foundation of the identified bioactive chemicals and support the qualitative phytochemical findings. Quantitative analysis demonstrated a concentration-dependent increase in phenolic and flavonoid levels. The total phenolic content (TPC) was 4.31 ± 0.11 mg gallic acid equivalents (GAE)/g at 4 mg/mL and 0.64 ± 0.51 mg GAE/g at 1 mg/mL. The total flavonoid content (TFC) was 0.72 ± 0.067 mg quercetin equivalents (QE)/g at 4 mg/mL and 0.50 ± 0.02 mg QE/g at 1 mg/mL. Overall, *A. indica* ethanolic plant extract contains diverse phytochemical classes, with FTIR confirming key functional groups and TPC/TFC highlighting its richness in phenolic and flavonoid compounds. These results provide a strong phytochemical basis supporting for further pharmacological investigations of *A. indica*.

Keywords: *Acalypha indica*, Soxhlet extraction, phytochemical screening, Fourier-transform infrared spectroscopy (FTIR), total phenolic content (TPC), total flavonoid content (TFC), medicinal plants, ethanol extract.

Calotropis gigantea: Phytochemical profiling and Free-Radical Scavenging

Kaushalya Ravichandran[1*], Jeevandran Sundarasekar[1], Sumitha Samuggam[1],Geethaa Sahgal[2]

[1]Faculty of Applied Science, AIMST University, Batu 3 1/2, Jalan, Bukit Air Nasi, 08100 Bedong, Kedah

[2]Faculty of Pharmacy, AIMST University, Batu 3 1/2, Jalan, Bukit Air Nasi, 08100 Bedong, Kedah

Corresponding author: kaushalyaravichandran5@gmail.com

Abstract

Calotropis gigantea is a medicinal plant widely utilized in traditional medicine for the treatment of various ailments, including inflammatory conditions, pain, and infectious diseases. Its therapeutic potential is strongly associated with its rich phytochemical composition, making it important to characterize its bioactive compounds. The present study aimed to profile the phytochemical constituents of *C. gigantea* extract and evaluate their antioxidant-related properties. Preliminary phytochemical screening confirmed the presence of diverse secondary metabolites, including alkaloids, flavonoids, tannins, saponins, and phenolic compounds, which are known to contribute to pharmacological activities. Fourier-transform infrared spectroscopy (FTIR) analysis further revealed the presence of characteristic functional groups, including hydroxyl, carbonyl, and aromatic rings, which supports the occurrence of phenolic and flavonoid derivatives. Quantitative assessments demonstrated measurable levels of antioxidant-related compounds, with total phenolic content (TPC) ranging from 0.046 ± 0.025 to 0.181 ± 0.028 mg gallic acid equivalents per gram extract (mg GAE/g). Total flavonoid content (TFC) ranging from 2.165 ± 0.063 to 2.422
± 0.049 mg quercetin equivalents per gram extract (mg QE/g). These findings indicate that *C. gigantea* is a valuable reservoir of phytochemicals with significant antioxidant potential, thereby supporting its ethnomedicinal relevance. This work contributes to the growing evidence linking phytochemistry to therapeutic applications and provides a scientific basis for further pharmacological investigations.

Keywords: *Calotropis gigantea*, phytochemistry, FTIR, total phenolic content, total flavonoid content.

Determination Of Antimicrobial Potential of Various Extracts of *Manilkara Zapota (L)* Seeds

Sarah Grace Andrew *, Lau Jun Ting, Nanthinisri, Shivkanya Fuloria, Sundram Karupiah,

Neeraj Kumar Fuloria

[1]Faculty of Pharmacy, AIMST University, Bedong 08100, Kedah, Malaysia

[2]Institute for Research in Molecular Medicine, Universiti Sains Malaysia,11800 USM, Pulau Pinang, Malaysia

Corresponding author: yoghinnimanogaran@gmail.com

Abstract

Background: The emergence of antibiotic resistance has intensified the search for safer, plant-based alternatives with antimicrobial potential. *Manilkara zapota* (L.), commonly known as sapota or chikku, is traditionally used in various medicinal systems and reported to possess multiple pharmacological activities.

Objective: This study aimed to evaluate the antimicrobial efficacy of different solvent extracts (methanol, ethanol, acetone, ethyl acetate, petroleum ether) of *M. zapota* seeds against pathogenic bacterial strains.

Material and methods: Seeds of *Manilkara zapota* were collected, dried, and the outer seed coat was removed to obtain the kernel. The kernels were further dried and ground to a fine powder using mortar and pestle. Successive extraction of the powdered material was carried out using different solvents: methanol, ethanol, petroleum ether, ethyl acetate, and acetone. The obtained extracts were subjected to phytochemical screening to identify the presence of alkaloids, flavonoids, tannins, glycosides, proteins, and phenolic compounds. Antimicrobial activity was evaluated using the agar cup-plate method against selected bacterial strains by measuring the zones of inhibition.

Results and discussion: Phytochemical screening confirmed the presence of alkaloids, flavonoids, glycosides, tannins, and phenolic compounds in selected extracts. Antimicrobial activity, assessed by the agar cup-plate method, revealed that methanolic and acetone extracts exhibited significant inhibition zones, particularly against *Vibrio cholerae, Salmonella paratyphi A,* and *Shigella flexneri*. The methanolic extract demonstrated the strongest activity, likely attributed to its alkaloid and flavonoid content.

Conclusion: In contrast, ethanolic and ethyl acetate extracts showed minimal or no effect on the tested strains. These findings suggest that *M. zapota* seed extracts, especially methanolic and acetone fractions, possess promising antimicrobial potential and could serve as leads for developing alternative therapeutic agents against infectious diseases.

Keywords: *Manilkara Zapota*; Antimicrobial activity; Methanolic Extract.

Cyano-pyrimidine Chalcone Hybrids: Molecular Design, Synthesis, and Anticancer Potential via LSD1 Inhibition

Md. Khalid Saifullah, *M. Shaquiquzzaman, M. Mumtaz Alam

Drug Design and Medicinal Chemistry Lab, Department of Pharmaceutical Chemistry, SPER, Jamia Hamdard, 110062, New Delhi, India

Corresponding author: mszaman@jamiahamdard.ac.in

Abstract

Cancer remains a leading cause of morbidity and mortality worldwide, with millions of new cases and deaths reported each year. Conventional anticancer therapy faces multiple challenges including limited efficacy and associated with multiple adverse effects. LSD1 represents a key epigenetic regulator in cancer progression. Targeting LSD1 with small-molecule inhibitors has emerged as a promising anticancer strategy. So, our study aimed at exploration of novel, potent and safe anticancer agents, targeting LSD1. In this study, a series of novel cyano-pyrimidine chalcone derivatives were synthesized and characterized with various spectroscopic techniques. The synthesized compounds were evaluated against HT29 colon cancer and A-549 lung cancer cell lines via SRB assay, with several compounds exhibiting formidable antiproliferative activity against both cell lines. Molecular docking studies against LSD1 indicated favorable binding interactions, with docking scores < -7 kcal/mol. Among all, compound **VIIC** proved most active anticancer agent, and was further evaluated for *in vitro* LSD1 inhibitory activity, yielding an IC_{50} value of 0.333 μM, far better than standard tranylcypromine (IC_{50} of 22.3 μM). The *in silico* ADMET evaluation of these derivatives demonstrated acceptable metabolic stability in human liver microsomes with minimal inhibition of cytochrome P450 enzymes (CYPs). The results suggest that compound **VIIC** can serve as a promising lead for the development of anticancer agents.

Keywords: LSD1, Chalcone, Cyano-pyrimidine, Cancer.

Estradiol Derivatives: A Possible Treatment Option for COVID-19

Darakhshan Parveen, *M. Mumtaz Alam, M Shaquiquzzaman

Drug Design and Medicinal Chemistry Lab, Department of Pharmaceutical Chemistry, School of Pharmaceutical Education & Research, Jamia Hamdard, New Delhi-110062

Corresponding author: mmalam@jamiahamdard.ac.in

Abstract

Estradiol has become a topic of interest after the coronavirus outbreak. It has been extensively studied to find the link between less severe coronavirus infection in females and the high levels of estradiol present in the female body. As estradiol provides a protective effect against cardiovascular diseases, it is possible that it was also involved in shielding against coronavirus. Based on this hypothesis, a library of estradiol derivatives was designed and evaluated using *in-silico* methods. The compounds targeted Mpro and ACE2, and showed better potential than the existing drugs. They were also compared to dexamethasone, as it has been extensively used in severe cases of COVID-19. In addition to that, both estradiol and dexamethasone have the same basic steroid ring and the immunosuppressant nature of dexamethasone limits its use. The MD Simulation of the designed compounds was also conducted, which depicted the stability of the designed compounds. ADMET profiling of the compounds was also done, which showed that they are drug-like molecules and it is possible to synthesize them. They can be further studied *in vivo* to strengthen the data obtained using ADMET, molecular docking and MD Simulation.

Keywords: Estradiol, coronavirus, *in-silico*.

Phytochemical Profiling of HPLC Analysis on *Ganoderma Lucidum* Extracts

Nor Idayanti Abd Rahman[1*], Nurul 'Izzah Mohd Sarmin [2,3], Hafizul Izwan Mohd Zahari[1], Khor Goot Heah [2,4]

[1] Department of Periodontology, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Malaysia

[2] Department of Preclinical Science Studies, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Malaysia

[3] Atta-ur-Rahman Institute for Natural Product Discovery, UiTM Puncak Alam Campus, Puncak Alam, Malaysia

[4] Oral and Maxillofacial Disease Research Group, Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Malaysia

Corresponding author: gootheah@uitm.edu.my

Abstract

Aim: This study aimed to characterize the solvent-dependent phytochemical profiles of *Ganoderma lucidum* (GL) cultivated in Malaysia through comparative HPLC analysis.

Materials and Methods: GL was extracted using three solvents of varying polarities: dichloromethane (DCM), methanol (MeOH), and ethyl acetate (EA). High-performance liquid chromatography (HPLC) was performed to profile the compounds, and tentative identification was made based on peak patterns and retention times reported in published GL phytochemical studies.

Results: HPLC analysis revealed distinct solvent-dependent phytochemical profiles. The EA extract exhibited the highest diversity (>90 peaks) and was dominated by phenolics and triterpenoids. The DCM extract contained ~60 peaks, mainly lipophilic triterpenoids, while the MeOH extract showed ~53 peaks enriched in ganoderic acids and polysaccharides.

Conclusion: *Ganoderma lucidum* extracts, especially the EA fraction, show that solvent polarity significantly influences phytochemical recovery, underlining the importance of extraction method selection.

Keyword: Profiling, HPLC, Ganoderma lucidum, extracts.

Papain-Encapsulated Selenium Nanoparticles as a Novel Drug Delivery System for Hepatocellular Carcinoma: Evidence from 2D, 3D, and In Silico Studies

Mustafa Hatem Nafea* [1, 2], Majid Sakhi Jabir[3], Ahmed Abdullah Mohammed[2], Mogana Das Murtey[2]

[1]College of Biomedical Engineering, University of Technology-Iraq

[2]School of Dental Sciences, University Sains Malaysia, Kubang Kerian, Kelantan, Malaysia.

[3]College of Applied Sciences, University of Technology- Iraq, Baghdad, Iraq

Corresponding author: mustafa.h.nafea@uotechnology.edu.iq

Abstract

Recent progress in nanomedicine and nanotechnology has expanded the range of multifunctional nanostructures. Hence, novel solutions have been generated for targeted systems to deliver medication in oncology and nuclear medicine. Papain is a *Carica papaya* protease that is a feasible green nanotechnology option given its medicinal properties, such as effects against cancer. This study examined the use of papain-loaded selenium nanoparticles (Pap-Se NPs) against HepG2 hepatocellular carcinoma cells. The Pap-Se NPs were prepared by chemical synthesis. UV–Vis, Fourier transform infrared, and transmission electron microscopy (TEM) were used to examine the structural, optical, and morphological characteristics of the Se NPs. The activity of the Se NPs, Papain, and Pap-Se NPs against cancer was examined using a cytotoxicity assay and acridine orange/ethidium bromide (Ao/EB) staining. Pap-Se NPs showed a higher cytotoxicity rate than Se NPs alone. The growth of spheroids in a three-dimensional (3D) model of HepG2 cells was reduced by Pa-Se NPs. Molecular docking determined the optimal Pa-Se NP conformation against the 7ZA2 receptor in hepatocellular carcinoma cells. Se-Pap nanopreparation has strong in vitro activity and holds promise as a potential candidate for further development towards clinical applications as an anticancer agent.

Keywords: Molecular docking, nanomedicine, nanotechnology, cytotoxicity assay.

Tailoring virus-mimicking polymeric nanoparticles as an ingenious mitochondrial-directed drug delivery system for the treatment of triple-negative breast cancer

Mahak Fatima[1*], Prashant Kesharwani[2]

[1]Department of Pharmaceutics, School of Pharmaceutical Education and Research, Jamia Hamdard, New Delhi 110062, India.

[2]Department of Pharmaceutical Sciences, Dr. Harisingh Gour Vishwavidyalaya, Sagar, Madhya Pradesh, 470003, India.

Corresponding author: mahak5010@gmail.com

Abstract

Triple-negative breast cancer (TNBC) is a highly heterogeneous subtype of breast cancer with no approved targeted therapies, highlighting the urgent need for novel systems. Since cancer cells rely on the "Warburg effect" for energy, this pathway can be exploited for selective targeting via virus-mimicking biodegradable polymeric nanoparticles (PNPs). Certain polymers offer high transfection efficiency and endosomal escape, while mitochondrial disruption may induce complete cancer cell death. To prepare polymeric NPs loaded with a mitochondrial-disrupting agent conjugated to paclitaxel. Furthermore, to surface-engineer NPs with carbohydrates and characterize them for physicochemical parameters and in vitro drug release. Also, to study the *in vivo* anticancer efficacy of the prepared nanoparticles. *In vitro* and *in vivo* studies showed carbohydrate-functionalized PNPs actively targeted TNBC cells via GLUT transporter uptake. Once internalized, the polymer degraded, releasing the mitochondrial targeting agent along with the drug, which localized to mitochondria, disrupted function, and triggered apoptosis. Leveraging the Warburg effect for active targeting and mitochondrial impairment, these nanoparticles provide a novel therapeutic approach with the potential to improve TNBC outcomes.

Keywords: Triple-negative breast cancer; Warburg effect; Mitochondrial targeting.

Neuroprotective effect of *Medicago sativa* (Alfalfa) in lead acetate-induced schizophrenia in Zebrafish

Aditi[1]*, Dr. Vrish Dhwaj Ashwlayan, Anushka Sharma

Department of Pharmaceutical Technology, Meerut Institute of Engineering & Technology (MIET), Meerut

Corresponding author: aditi.p.cology.2024@miet.ac.in

Abstract

Schizophrenia is a chronic neuropsychiatric disorder manifesting itself through cognitive impairment, social withdrawal, hallucinations, and motor and emotional and emotional function problems. The neurotoxic effect of lead, its ability to initiate oxidative stress, and its effect on dopaminergic deregulation have been linked with the development and progression of schizophrenia-like symptoms in individuals who are exposed to heavy metals, especially lead. The current paper will explore the Neuroprotective effects of *Medicago sativa* (Alfalfa) extract on schizophrenia caused by lead poisoning in Zebrafish. Social interaction, memory, and locomotor activity are some of the neurobehavioral parameters that will be measured in order to evaluate cognitive and psychomotor functions. To understand the mechanisms of protection, the oxidative stress indicators (MDA, SOD, CAT, and GSH) and neurotransmitter modulation will be evaluated using biochemical analysis. The in-vitro assessment of the brain tissues with the help of histopathology will additionally verify that neurons remain intact and preserved against damage caused by lead. Antioxidant, anti-inflammatory, and Neuroprotective properties of the phytoconstituents of *Medicago sativa* are likely to alleviate the schizophrenia like symptoms through the reduction of oxidative stress and recovery of dopamine concentration. The present paper demonstrates the promise of Alfalfa as a safe, natural, and effective therapeutic candidate in the treatment of neuropsychiatric disorders caused by heavy metals, which could be used as a promising complementary therapy in the treatment of schizophrenia.

Keywords: *Medicago sativa*, Alfalfa, Lead acetate, Zebra fish, Schizophrenia, Neuroprotection, Oxidative stress, Dopaminergic system, Antioxidant therapy, Neurobehavioral analysis.

Formulation and Evaluation of Solid Lipid Microparticle of Aripiprazole for Brain Targeting

Rythem

Bharat Institute of Technology, Partapur, Meerut

Corresponding author: rythempharmacy@gmail.com

Abstract

Epilepsy remains a major neurological disorder characterized by recurrent seizures, often associated with drug resistance and limited central nervous system (CNS) bioavailability of conventional antiepileptic drugs. Cenobamate (CNB), a novel antiepileptic agent with dual mechanisms—enhancement of γ-aminobutyric acid (GABA-A) currents and inhibition of voltage-gated sodium channels—has demonstrated superior clinical efficacy but suffers from poor aqueous solubility, extensive first-pass metabolism, and limited brain uptake, thereby restricting its therapeutic potential. To overcome these barriers, the present study aimed to formulate and evaluate solid lipid microparticles (SLMs) of cenobamate for brain targeting.

SLMs were prepared using the hot melt emulsification and quench method employing glyceryl behenate (Compritol® 888 ATO) as the lipid matrix and Poloxamer 188 as the stabilizer. Optimization was carried out by varying drug-to-lipid ratios and surfactant concentrations. The prepared formulations were evaluated for particle size, polydispersity index (PDI), zeta potential, entrapment efficiency, and drug loading. Fourier-transform infrared spectroscopy (FTIR) and differential scanning calorimetry (DSC) confirmed the absence of chemical incompatibility and partial amorphization of CNB within the lipid matrix. Scanning electron microscopy (SEM) revealed spherical particles with smooth surfaces.

In-vitro release studies demonstrated a biphasic release pattern with an initial burst followed by sustained release up to 24 h, fitting the Higuchi and Korsmeyer–Peppas kinetic models. *Ex vivo* permeation across intestinal mucosa showed significantly improved drug permeation compared to pure drug suspension. In-vivo pharmacokinetic studies in rats indicated enhanced plasma AUC and markedly increased brain concentrations of CNB-SLMs, yielding a brain targeting index (BTI) > 1.5 compared to CNB suspension. Pharmacodynamic evaluation using maximal electroshock (MES) and pentylenetetrazole (PTZ)-induced seizure models revealed improved seizure latency, reduced seizure duration, and higher percentage protection in SLM-treated groups. In conclusion, cenobamate-loaded solid lipid microparticles exhibited excellent physicochemical characteristics, sustained release, enhanced oral bioavailability, and superior brain targeting efficiency. The findings suggest that SLMs could be a promising carrier system for improving the therapeutic efficacy of cenobamate in epilepsy management, offering a novel platform for targeted CNS drug delivery.

Keywords: Cenobamate, Solid lipid microparticles, Brain targeting, Epilepsy, Bioavailability, Pharmacokinetics, Seizure models.

Investigation of the Potential Role of Terpinolene in Reversing Renal Inflammation, Apoptosis, and Oxidative Stress in Cyclophosphamide-Induced Nephrotoxicity in Wistar Albino Rats

Adeeba Laeeq

Jamia Hamdard University

Corresponding author: adeebahmedapple@gmail.com

Abstract

Cyclophosphamide (CP), a potent anticancer drug, is limited by dose-dependent nephrotoxicity mediated through oxidative stress, inflammation, and apoptosis. The present study evaluated the nephroprotective potential of Terpinolene, a naturally occurring monoterpene, in CP-induced renal injury in Wistar albino rats. Nephrotoxicity was induced with a single intraperitoneal dose of CP (200 mg/kg), and animals were treated with Terpinolene (12.5, 25, and 50 mg/kg, p.o.) for 14 days. Resveratrol was used as a reference standard. Biochemical, immunohistochemical, inflammatory, and histopathological assessments were performed. CP administration resulted in significant elevation of oxidative stress, renal dysfunction, pro-inflammatory cytokines, and caspase-3 expression, along with marked histopathological damage. Terpinolene, particularly at 50 mg/kg, significantly reversed these alterations, demonstrating antioxidant, anti-inflammatory, anti-apoptotic, and nephroprotective effects comparable to resveratrol. Terpinolene offers significant protection against CP-induced nephrotoxicity, highlighting its therapeutic potential in reducing renal damage associated with chemotherapy.

Keywords: Terpinolene, Cyclophosphamide, Nephrotoxicity, Oxidative stress, Apoptosis, Inflammation.

Nanotechnology-Based Dialyzers: Improving the Removal of Uremic Toxins

Vishal Panwar

Sardar Bhagwan Singh University, Dehradun, Uttarakhand

Corresponding author: panwarvishal204@gmail.com

Abstract

Millions of people worldwide suffer from chronic kidney disease (CKD), and the main treatment for end-stage renal disease (ESRD) is still hemodialysis. However, some uremic toxins are difficult to remove with traditional dialysis techniques, especially intermediate molecules and protein-bound solutes, which are strongly associated with inflammatory and cardiovascular problems.

The design and operation of dialyzer membranes can be revolutionized by nanotechnology. The use of nanomaterials in dialyzers, such as metal-organic frameworks (MOFs), graphene oxide, carbon nanotubes, and nanofibers, can improve biocompatibility, adsorption, and selectivity. These complex membranes permit the targeted removal of uremic toxins that are hydrophilic and hydrophobic, particularly those that standard membranes are unable to effectively remove.

This presentation describes the materials employed, methods of action, and comparative analysis of the latest advancements in nanotechnology-based dialyzers.

Keywords: chronic kidney disease (CKD), hemodialysis, metal-organic frameworks (MOFs), end-stage renal disease (ESRD).

Exosomal Pentad: Decoding Inter-Organ Communication in Metabolic Diseases for Next-Generation Therapeutics

Prathyusha V*

Asst. Professor, Dept. Of Pharmaceutics, Narayana Pharmacy College

Corresponding Author: prathyv.9@gmail.com

Abstract

Metabolic diseases such as type 2 diabetes mellitus (T2DM), obesity, and cardiovascular disorders are driven by complex, multi-organ dysregulation. Exosomes—nano-sized extracellular vesicles secreted by nearly all cell types—are increasingly recognized as key mediators of inter-organ communication, carrying bioactive cargo including miRNAs, proteins, lipids, and metabolites. The concept of the "Exosomal Pentad" highlights the coordinated cross-talk among five major metabolic organs: liver, pancreas, skeletal muscle, adipose tissue, and intestine. Exosomal cargo influences insulin signaling, lipid metabolism, inflammation, and energy homeostasis, thereby contributing to the onset and progression of metabolic dysfunction. Recent studies have identified organ-specific exosomal miRNA signatures associated with insulin resistance, β-cell dysfunction, and systemic inflammation, suggesting their potential use as early diagnostic and prognostic biomarkers. Furthermore, engineered exosomes are being investigated as next-generation drug delivery systems for metabolic disease therapy, offering targeted and minimally immunogenic approaches to modulate pathological pathways. Despite these advances, significant challenges persist, including standardization of isolation methods, characterization of exosomal heterogeneity, and bridging preclinical discoveries to clinical translation. This presentation will summarize emerging evidence, highlight therapeutic opportunities, and propose future strategies for harnessing the exosomal pentad as a platform for precision medicine in metabolic disease management.

Keywords: Exosomes, Metabolic Diseases, Inter-Organ Communication, miRNA Biomarkers, Targeted Drug Delivery, Precision Medicine.

Development and Optimization and Characterization of Herbal Formulation for the Management of Ulcer

Ms Savita[1], Dr. Renu Malik[2]

[1]Research Scholar, Baba Mastnath University, Rohtak, Haryana, India.

[2]Faculty of Pharmaceutical Sciences, Baba Mastnath University, Rohtak, Haryana, India.

Corresponding author: savita.mehta21@gmail.com

Abstract

Gastritis, defined as inflammation of the gastric mucosa, with multifactorial etiologies including *Helicobacter pylori* infection, chronic use of non-steroidal anti-inflammatory drugs (NSAIDs), alcohol consumption, stress, and dietary irritants. Clinically, it presents with dyspepsia, abdominal discomfort, nausea, bloating, and in severe cases, mucosal erosion and ulceration. Conventional therapeutic regimens, comprising proton pump inhibitors, H2 receptor antagonists, antacids, provide effective symptomatic relief but are often limited by recurrence, antibiotic resistance and adverse effects. These limitations have prompted increasing interest in complementary and alternative medicine, particularly herbal formulation, for their potential to address multiple pathophysiological targets simultaneously. Herbal management of gastritis is based on several pharmacological actions, namely demulcent, anti-inflammatory, antimicrobial, antioxidant, and mucosal protective effects. These pathways not only provide symptomatic relief but also address underlying mechanisms such as inflammation, oxidative stress, and microbial overgrowth. In conclusion, herbal pathways represent a promising in the management of gastritis, offering symptomatic control to promote mucosal healing and reduce recurrence.

Keywords: Gastritis, Herbal formulation, Anti-inflammatory.

Precision Nanomedicine with AI Integration: Revolutionizing Cervical Cancer Therapy

Diksha*, Prof. (Dr.) Zeenat Iqbal and Dr. Aamir Mirza

Dept. of Pharmaceutics, SPER, Jamia Hamdard, New Delhi, 110062

Corresponding author: dikshakhatkar25@gmail.com

Abstract

Cervical cancer (CC) has historically been the fourth most common and deadliest malignancy among women worldwide. Early detection through cervical cytology screening, human papillomavirus (HPV) testing and **effective** therapeutic interventions are critical for preventing cervical intraepithelial neoplasia (CIN). Despite significant advances in nanotechnology, achieving accurate diagnosis of cervical cancer remains challenging due to inherent biological heterogeneity and clinical complexities. Artificial intelligence will move from being a simple diagnostic device to being used as a tool for effective therapy of cervical cancer. Advances in computer-aided technologies, including robotic systems and AI-driven platforms, are increasingly applied across screening, diagnostic, and treatment modalities. Moreover, integrating multi-omics approaches, genomics, epigenomics, proteomics, and metabolomics, with conventional chemotherapeutics offers a promising strategy to overcome the limitations of standard therapies. AI-based modeling, simulations, drug repurposing, and target identification further strengthen precision oncology approaches. By leveraging these cutting-edge technologies, there is substantial potential to reduce the global burden of cervical cancer, particularly in low- and middle-income countries, ultimately improving patient outcomes and advancing precision medicine. These developments underscore a transformative shift from conventional diagnostics to an integrated AI-enabled, multi-omics approach for comprehensive cervical cancer management.

Keywords: Cervical cancer, Artificial Intelligence (AI), Nanotechnology, Multi-omics.

Neuroprotective effect of *Medicago sativa* (Alfalfa) in lead acetate-induced schizophrenia in Zebrafish

Aditi[1]*, Dr. Vrish Dhwaj Ashwlayan, Anushka Sharma

Department of Pharmaceutical Technology, Meerut Institute of Engineering & Technology (MIET), Meerut

Corresponding author: aditi.p.cology.2024@miet.ac.in

Abstract

Schizophrenia is a chronic neuropsychiatric disorder manifesting itself through cognitive impairment, social withdrawal, hallucinations, and motor and emotional and emotional functions problems. The neurotoxic effect of lead, its ability to initiate oxidative stress, and its effect on dopaminergic deregulation has been linked with the development and progression of schizophrenia-like symptoms in individuals who are exposed to heavy metals especially lead. The current paper will explore the Neuroprotective effects of *Medicago sativa* (Alfalfa) extract on schizophrenia caused by lead poisoning in Zebrafish. Social interaction, memory, and locomotors activity are some of the neurobehavioral parameters that will be measured in order to evaluate cognitive and psychomotor functions. To understand the mechanisms of protection, the oxidative stress indicators (MDA, SOD, CAT, and GSH) and neurotransmitter modulation will be evaluated using biochemical analysis. The in-vitro assessment of the brain tissues with the help of histopathology will additionally verify that neurons remain intact and preserved against damage caused by lead. Antioxidant, anti-inflammatory, and Neuroprotective properties of the phytoconstituents of *Medicago sativa* are likely to alleviate the schizophrenia like symptoms through the reduction of the oxidative stress and recovery of dopamine concentration. The present paper demonstrates the promise of Alfalfa as a safe, natural and effective therapeutic candidate in treatment of neuropsychiatric disorders caused by heavy metal, which could be used as a promising complementary therapy in the treatment of schizophrenia.

Keywords: *Medicago sativa*, Alfalfa, Lead acetate Zebra fish Schizophrenia Neuroprotection Oxidative stress, Dopaminergic system, Antioxidant therapy, Neurobehavioral analysis.

Pharmacovigilance study of adverse drug reactions associated with respiratory drugs in a tertiary care hospital

Ilma Parveen and Dr. Ashutosh Pathak

Teerthanker Mahaveer College of Pharmacy, Teerthanker Mahaveer University, Moradabad, India.

Corresponding author: ilma.049271@tmu.ac.in

Abstract

Respiratory diseases such as asthma, chronic obstructive pulmonary disease (COPD), and acute respiratory infections are among the leading causes of morbidity and mortality worldwide. Pharmacological management relies heavily on bronchodilators, corticosteroids, leukotriene antagonists, antihistamines, antibiotics, and newer biologics. While these agents are indispensable for controlling symptoms and preventing exacerbations, they are also associated with a wide range of adverse drug reactions (ADRs) that may affect patient safety, adherence, and overall therapeutic outcomes. Pharmacovigilance, the science of detecting, assessing, and preventing ADRs, is therefore critical in optimizing the safe use of respiratory medicines.

This review aims to provide a comprehensive overview of ADRs associated with commonly used respiratory drugs, drawing evidence from published pharmacovigilance studies, case reports, spontaneous reporting databases, and observational research conducted in tertiary care settings. Bronchodilators, particularly β2-agonists and theophylline, are frequently associated with tremors, palpitations, and cardiovascular effects. Inhaled and systemic corticosteroids predispose patients to oral candidiasis, osteoporosis, and metabolic disturbances. Antibiotics, widely prescribed for respiratory infections, carry risks of gastrointestinal intolerance, hepatotoxicity, and antimicrobial resistance. The advent of targeted therapies and biologics, such as monoclonal antibodies, has introduced new safety concerns including hypersensitivity and immunological reactions Overall, most ADRs linked with respiratory drugs are mild to moderate in severity and often preventable with appropriate monitoring, dose adjustment, and patient counselling. However, severe and life-threatening reactions, though less frequent, remain a significant concern in clinical practice. Strengthening pharmacovigilance systems, encouraging spontaneous reporting by healthcare professionals, and integrating pharmacogenomic insights may help in early detection and effective management of ADRs. A robust understanding of the ADR profile of respiratory drugs is essential to enhance patient safety in tertiary care hospitals. Continuous pharmacovigilance, rational prescribing, and active involvement of healthcare providers remain the cornerstones of minimizing drug-related risks while ensuring optimal therapeutic benefit.

Keywords: Pharmacovigilance, Adverse drug reactions, Respiratory drugs, Patient safety, Tertiary care hospitals.

Plant-Derived Compounds in Biofilm Control: A Phytochemical Perspective

Karishma Barthwak

Shri Guru Ram Rai University

Corresponding author: karishmanov29@gmail.com

Abstract

Antimicrobial resistance is rising at an alarming rate globally, posing a significant challenge to the effective management of infectious diseases. A major contributor to this crisis is the ability of pathogenic microorganisms to form biofilms complex, structured communities of microbes embedded in a self-produced extracellular polymeric substance (EPS) matrix. These biofilms act as protective niches for multidrug-resistant cells, conferring resistance to conventional antibiotics and host immune defences. Therefore, biofilm-associated infections are notoriously difficult to eradicate, often resulting in recurrence, chronicity, and increased morbidity and mortality. In addition, the limited efficacy and possible toxicity of existing drugs accentuate the urgent need for innovative and safer therapeutic strategies. In this context, plant-derived secondary metabolites, commonly referred to as phytochemicals, have emerged as promising alternatives due to their diverse chemical structures and multi-target mechanisms of action. Unlike conventional antibiotics, phytochemicals disrupt biofilms through multiple pathways, including inhibition of quorum sensing, motility, and adhesion, as well as the induction of oxidative stress within microbial communities. Furthermore, their ability to act synergistically with standard antibiotics enhances biofilm disruption and restores drug susceptibility. Phyto-drugs, encompassing crude plant extracts, essential oils, and purified compounds such as quercetin, piperine, and berberine, provide a multipurpose and justifiable platform for emerging novel anti-biofilm therapies. Beyond medical therapeutics, phytochemicals have comprehensive applications in food preservation, preventing microbial spoilage in medical device coatings, reducing biofilm formation in water treatment, enhancing sanitation and in agriculture controlling plant pathogens. All these implications highlight phytochemicals as multi-functional agents capable of addressing biofilm-related infections and antimicrobial resistance across medical, industrial, environmental, and agricultural contexts.

Keywords: Antimicrobial resistance, Biofilm, Phytochemicals, Phyto-drugs, Natural antibiofilm agents.

Evaluation of *Putranjiva roxburghii* Seed Extract in Letrozole-Induced Polycystic Ovarian Syndrome in Mice

Sujain Gautam, Dr. Ritu Rani

Department of Pharmacy, SMAS, Galgotias University, Plot No. 2, Sector 17-A, Yamuna Expressway, Greater Noida-201310, Uttar Pradesh, India.

Corresponding author: Sujaingautam001@gmail.com

Abstract

Polycystic Ovarian Syndrome (PCOS) is a common endocrine disorder in women of reproductive age, characterized by hyperandrogenism, anovulation, and polycystic ovarian morphology. Current pharmacological options provide only symptomatic relief and are often limited by side effects and poor compliance. This study aimed to investigate the therapeutic potential of *Putranjiva roxburghii* seed extract in a letrozole-induced PCOS model in female Swiss albino mice. PCOS was induced with oral administration of letrozole (1 mg/kg) for 21 days, after which mice were treated with hydroalcoholic seed extract at two doses (200 mg/kg and 400 mg/kg) and compared with a standard metformin group (250 mg/kg). The results indicated that the 400 mg/kg dose of *Putranjiva roxburghii* significantly restored the regularity of the estrous cycle, reduced body weight and blood glucose, normalized lipid and hormonal profiles, and improved ovarian morphology. Histological analysis revealed the reappearance of healthy follicles and corpora lutea with minimal cyst formation, confirming restoration of ovarian function. The observed effects were dose-dependent and comparable to those of the standard drug metformin. In conclusion, *Putranjiva roxburghii* demonstrated substantial anti-PCOS activity through hormonal regulation, metabolic correction, and ovarian recovery.

Keywords: Polycystic Ovarian Syndrome (PCOS), endocrine disorder, hyperandrogenism, anovulation.

Avenues And Modern Methods: Realising the Importance of Providing Better Healthcare

Ashu Saini*

GNIT College of Pharmacy

Corresponding author: Ashusaini9910@gmail.com

Abstract

Modern healthcare is steadily evolving through both abstract avenues and innovative methods that emphasize the importance of providing better medical facilities for all. On a broader level, healthcare systems today focus on principles such as universal access, equity, and patient-centered care, ensuring that treatment is not limited to curing diseases but also preventing them through awareness and lifestyle guidance. Alongside these ideals, modern methods have transformed how healthcare is delivered. Digital health platforms and telemedicine allow doctors to reach patients in remote areas, while artificial intelligence and data analytics help in diagnosing illnesses early and personalizing treatments. Robotics and minimally invasive surgeries reduce recovery time and increase precision, while wearable devices empower individuals to monitor their own health in real time. Advances in biotechnology and genomics are opening doors to treatments tailored to an individual's genetic makeup. Moreover, public health innovations like vaccination drives, mobile clinics, and trained community health workers ensure that healthcare is accessible even in underserved regions. Together, these avenues and methods highlight a shift towards a more inclusive, efficient, and preventive model of healthcare that prioritizes both individual well-being and public health. The integration of traditional healthcare avenues with modern innovations offers a comprehensive path toward achieving quality healthcare for all.

Keywords: healthcare, patient-centered care, telemedicine.

Indian Herbal Medicine of Traditional Origin Used as an Antipyretic

[1]Vinay Mahajan, [2]Ankit Sahu, [2]Govind Soni, [2]Chetna Malviya, [3]Mohit Chaturvedi

[1]Institute of Pharmacy, Dr. A.P.J. Abdul Kalam University, Indore (M.P.)- India

[2]School of Pharmacy, Dr. A.P.J. Abdul Kalam University, Indore (M.P.)- India

[3]College of Pharmacy, Dr. A.P.J. Abdul Kalam University, Indore (M.P.)- India

Corresponding author: mohitchaturvedi@aku.ac.in

Abstract

Herbal care, which refers to the traditional system of medicine, is practiced around the globe, and for centuries, herbs have been the source of many drugs. Medicinal plants contain a wide array of chemical compounds that serve as the main source of therapeutic agents to address human health issues. In recent years, there has been a notable growth in the field of herbal medicine, with these remedies becoming increasingly popular in both developing and developed nations due to their natural origins and minimal side effects. Many traditional medicines currently in use are derived from medicinal plants, minerals, and organic materials. The World Health Organization (WHO) has identified various plants utilized for medicinal purposes globally. India is recognized as the largest producer of medicinal herbs and is often referred to as the botanical garden of the world. This review focuses on herbal drug preparations and the plants used in the treatment of fever. The use of Ayurvedic medicines is prevalent among both adults and children and is on the rise in numerous regions across the globe. This paper will explore the advantages of herbal medicines, including antipyretic properties.

Keywords: Remedies, traditional, botanical, antipyretic.

Artificial Intelligence in Scholarly Writing and Education in the Field of Clinical Pharmacy: Implications and Prospects

[1]Madhuri Karma, [2]Prajakta Madhukar Shelke, [1]Govind Soni, [2]Neha Goswami, [2]Mohit Chaturvedi

[1]School of Pharmacy, Dr. A.P.J. Abdul Kalam University, Indore (M.P.)- India

[2]College of Pharmacy, Dr. A.P.J. Abdul Kalam University, Indore (M.P.)- India

Corresponding author: mohitchaturvedi@aku.ac.in

Abstract

The introduction and swift advancement of artificial intelligence (AI) models available for public use in 2023 has become a significant subject in the media. A major focus of the conversation has been the application of AI in scholarly writing and publishing in the university and scientific sectors. Numerous AI-driven tools exist that address different stages of the research process, ranging from the development of research questions and structuring academic assignments, journal publications, and grant applications. The continuous advancement of AI technology will inevitably incite ongoing discussions. It is imperative to conduct continuous research on the implications, benefits, and limitations of AI in academia to guide the formulation of new strategies and regulations in clinical pharmacy practice, research, and education as this transformative technology develops. Despite the associated risks and uncertainties, AI could act as a catalyst for steering pharmacy education towards a more clinically-focused orientation, aligning with the profession's goal of improving clinical pharmacy practice.

Keywords: Artificial intelligence, conversation, implications, transformative.

Various Approaches in Floating Drug Delivery Systems

***Rahul Maskawade, [1]Manvendra Singh**

* Research Scholar, Faculty of Pharmacy, Dr. Preeti Global University, Indore (M.P.)

[1]Faculty of Pharmacy, Dr. Preeti Global University, Indore (M.P.)

Corresponding author: mohitchaturvedi@aku.ac.in

Abstract

Floating drug delivery systems (FDDS), also referred to as hydro dynamically balanced systems (HBS), swelling and expanding systems, polymeric bio-adhesive systems, modified-shape systems, high-density systems, and other delayed gastric emptying devices, are now utilized to extend gastric retention time (GRT). This research covers the latest technological breakthroughs in FDDS, including patented delivery methods and commercialized products, as well as their advantages and future prospects for oral controlled drug administration. FDDS is retained in the stomach, which is particularly useful for drugs that have low solubility or are unstable in intestinal fluids. Due to their bulk density being less than that of gastric fluids, FDDS can remain buoyant in the stomach without affecting the rate of gastric emptying for an extended period. The most recent advancements in FDDS involve both formulation and physiological factors that may affect gastric retention and formulation. This article also discusses various methods for creating a floating system, along with evaluation methods, characterization, and classification for the FDDS pharmaceutical dosage form. By overcoming physiological hurdles such as short stomach residence times and unexpected gastric emptying times, scientific and technological achievements have been made in the study and development of controlled-release oral drug delivery systems in recent years. So, in general, float dose systems are key technological medication delivery systems that have a stomach-retentive nature and provide a variety of options.

Keywords: Floating drug delivery systems, hydro dynamically, bio-adhesive systems, stomach-retentive.

A Comparative Analysis of the Effectiveness of Generic and Branded Medications in the Treatment of Hypertension

***Neetesh Singh, [1]Manvendra Singh**

* Research Scholar, Faculty of Pharmacy, Dr. Preeti Global University, Indore (M.P.)

[1]Faculty of Pharmacy, Dr. Preeti Global University, Indore (M.P.)

Corresponding author: mohitchaturvedi@aku.ac.in

Abstract

Hypertension, or high blood pressure, represents a common and serious health concern where the blood pressure against the artery walls is consistently elevated, often without any symptoms, but it increases the likelihood of heart attack, stroke, and kidney failure. Generic drugs are viewed as bioequivalent to their brand-name counterparts; however, concerns continue to arise regarding the effectiveness and safety of generic drugs, primarily due to small sample sizes and short follow-up times in the majority of studies. Brand-name drugs are frequently protected by patents and are typically produced by one company, whereas generic drugs can be manufactured by multiple companies once the patents expire. The main variations are in their appearance (such as color, shape, or markings) and the inactive ingredients, which do not alter the therapeutic effect of the medication. This study aimed to assess the long-term antihypertensive efficacy, cost-effectiveness, and cardiovascular outcomes of generic drugs versus brand-name drugs.

Keywords: Blood pressure, artery, bioequivalent.

Clinical Research on Drug-Drug Interactions Among Polypharmacy Patients

*** Mali Bharat Dilip, [1]Manvendra Singh**

* Research Scholar, Faculty of Pharmacy, Dr. Preeti Global University, Indore (M.P.)

[1]Faculty of Pharmacy, Dr. Preeti Global University, Indore (M.P.)

Corresponding author: mohitchaturvedi@aku.ac.in

Abstract

Polypharmacy is defined as either the concurrent use of several drugs or the administration of a greater number of medications than is clinically indicated. Clinical investigations affirm that polypharmacy significantly elevates the risk of drug-drug interactions (DDIs), which may result in adverse drug reactions (ADRs), hospitalizations, and mortality. The severity of these interactions can range from minor to major, and they are a leading cause of medication-related harm. Factors such as age, kidney impairment, and the complexity of pharmacotherapy increase this risk, making it essential to adopt personalized prescribing strategies, maintain close patient monitoring, and judiciously apply guidelines like the AGS Beers Criteria to enhance medication safety.

Keywords: Polypharmacy, concurrent, administration, medications, kidney impairment.

Antioxidant Activities of Synthetic Vs Natural Compounds

*** Patil Rahul Sahebrao, [1]Manvendra Singh**

* Research Scholar, Faculty of Pharmacy, Dr. Preeti Global University, Indore (M.P.)

[1]Faculty of Pharmacy, Dr. Preeti Global University, Indore (M.P.)

Corresponding author: mohitchaturvedi@aku.ac.in

Abstract

Natural antioxidants originate from living entities such as plants, algae, and microorganisms, whereas synthetic oxidants are artificially created through chemical processes in a laboratory. Comparative studies reveal that natural antioxidants frequently show superior health benefits and bioavailability, while synthetic antioxidants are characterized by their enhanced stability and consistency for specific uses, such as food preservation. However, the health concerns associated with synthetic antioxidants, including carcinogenicity and hormonal imbalance, have led to a preference for natural alternatives that also offer therapeutic effects against oxidative stress and inflammation.

Keywords: Algae, microorganisms, bioavailability, carcinogenicity.

Alternatives to Animal Experimentation

***Dharmendra Yadav, Neha Goswami, Akhilesh Gupta, Mohit Chaturvedi**

College of Pharmacy, Dr. A.P.J. Abdul Kalam University, Indore (M.P.)- India

Corresponding author: mohitchaturvedi@aku.ac.in

Abstract

The number of animals used in experiments has increased for innovative advancements in scientific technology across the globe. Although it is beneficial to employ alternatives in trials instead of live animals, their use should be limited for the sake of human, animal, and environmental welfare. The pain, suffering, and death experienced by animals during experiments are significant concerns. Animal testing for research purposes should only be carried out when necessary. There are several organizations that provide guidelines for the use of animal testing, including ICH, CPCSEA, NIH, and OECD. Alternatives to animal testing are sought to mitigate the disadvantages associated with animal research and to prevent unethical trials. The three 'R's stand for reduction, refinement, and replacement, govern the experimental use of animals for testing. Animals are employed in the development of medical treatments and in determining the toxicity and safety of medications. Preferred methods should utilize the minimum number of animals that yield reasonable results and favor species with a lower likelihood of experiencing distress, pain, and injury. Other methods employed include in vitro testing techniques, tissue culture methods, in-silico (computer modeling) procedures, and non-invasive imaging techniques such as MRIs and CT scans, as well as microfluidic chips. Numerous advantages associated with alternatives include time efficiency, effectiveness, reduced number of subjects, and cost-effectiveness.

Keywords: Experiments, innovative, toxicity, alternatives.

Preparation Of Phytoniosomal Gel for Skin Disease Caused by Candida Albicans

Shilpa[1]*, Dr. Pawan Kumar Jalwal[2]

[1]Research Scholar, Department of Pharmaceutical Sciences, Baba Mastnath University, Rohtak (Haryana)

[2]Dean, Department of Pharmaceutical Sciences, Baba Mastnath University,

Rohtak (Haryana)

Corresponding Author: shilpaailwadi29@gmail.com

Abstract

Fungal infections caused by *Candida albicans* pose a significant challenge in dermatological therapy due to their recurrent nature and resistance to conventional antifungal agents. The present study focuses on the formulation and evaluation of a phytoniosomal gel containing plant-derived bioactive compounds for the effective treatment of *Candida albicans*-induced skin infections. Phytoniosomes, novel vesicular carriers composed of non-ionic surfactants and cholesterol, were prepared using the thin-film hydration method to enhance the solubility, permeability, and bioavailability of the phytoconstituents. The optimized phytoniosomal formulation was incorporated into a carbopol-based hydrogel to facilitate topical delivery. Physicochemical characterization, including particle size, zeta potential, and entrapment efficiency, confirmed the stability and nanoscale properties of the formulation. In vitro antifungal studies demonstrated that the phytoniosomal gel exhibited superior inhibitory activity compared to conventional formulations, attributed to its enhanced skin penetration and sustained drug release. Furthermore, the prepared gel exhibited favorable pH, viscosity, and spreadability, ensuring suitability for dermal application. The study concludes that phytoniosomal gel represents a promising phytopharmaceutical approach for managing *Candida albicans*-associated skin diseases, combining natural antifungal efficacy with advanced drug delivery technology for improved therapeutic outcomes.

Keywords: Phytoniosomes, *Candida albicans*, antifungal gel, phytoconstituents, topical drug delivery.

Assessing Hemoglobin Levels in Head and Neck Cancer Survivors One-Year Post-Treatment: A Systematic Review and Meta-Analysis

Mayur Porwal[1], Jitendra Kumar Verma[2], Megha Tiwari [1*]

Teerthanker Mahaveer College of Pharmacy, Teerthanker Mahaveer University, Moradabad, U.P., India[1]

J. K. Cancer Institute, Rawatpur, Kanpur, U.P., India[2]

Corresponding Author: tiwarimegha860@gmail.com

Abstract

This thorough review investigates post-treatment hemoglobin levels of cancer in neck and head survivors one year following treatment completion. Pretreatment hemoglobin values can be utilized to predict prognosis in patients receiving concomitant chemoradiotherapy for locally advanced head and neck squamous cell carcinoma. This in turn, affects tumor cell radiosensitivity and reduces the efficiency of treatment therapies. Understanding the pretreatment hemoglobin readings is therefore critical in predicting results for individuals undertaking this specific therapy regimen. research focused on improving risk classification, treatment, and illness outcomes. There has been a growing interest in the topic of survivorship care during the last decade. Despite the joint efforts of a multidisciplinary team in controlling cancer and treatment-related side effects, as well as enhancing survivors' overall quality of life (QOL), it has been observed that up to 60-65% of patients have at least one of these conditions. The goal of this research was to investigate the link between financial toxicity and survival in patients with HNC (head and neck cancer).

The focus of this study was to see if nutritional status indicators predict locoregional failure after intensity-modulated radiation treatment (IMRT) with concurrent chemoradiotherapy (CCRT) for SCCHN (squamous cell carcinoma of the head and neck).

Keywords: Cancer, Radiotherapy, Radio Sensitivity, Tumors, Hemoglobin.

P.R.S. Educational Trust Director's Message

"It gives me immense pleasure to welcome you to the IM-HST Summit 2025. This prestigious platform brings together visionaries, experts and scholars from across the globe to share insights, foster collaborations, and shape the future of healthcare, science and technology. At PRS Educational Trust, we believe in nurturing innovation, promoting research excellence, and creating opportunities for impactful knowledge exchange. I extend my heartfelt gratitude to all participants, speakers, and partners for their contribution to this meaningful journey. Together, let us inspire progress and build a better tomorrow.

Dr. Akhil Sharma"

P.R.S. Educational Trust

BS-1202 & 1206 12th Floor,
Galaxy Diamond Plaza, Sector-4,
Greater Noida (West), G.B. Nagar, U.P-201308
8766381032, 9634308658
www.prseducationaltrust.com

Published by
Weser Books, No. 79737
Äussere Weberstr. 57
02763 Zittau, Germany
Email: weserbooks@gmail.com

ISBN 9783964925893
9 783964 925893
Price - € 20