VELS
INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)
(Deemed to be University Estd. u/s 3 of the UGC Act, 1956)
PALLAVARAM, THALAMBUR, PERIYAPALAYAM, THIRUVANMIYUR - CHENNAI

School of Pharmaceutical Sciences

VISTAS, Pallavaram, Chennai, Tamil Nadu

Association of Pharmacy Professionals

TAMILNADU STATE BRANCH

INDO KOREAN INTERNATIONAL BRANCH

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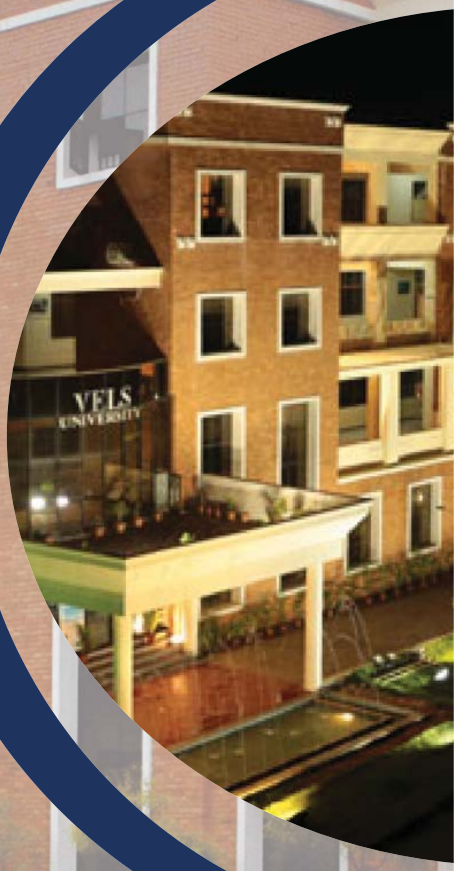
Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences

DATE : 27 March 2026



INDO KOREAN INTERNATIONAL CONFERENCE ON ADVANCES IN NANOTECHNOLOGY, DRUG DEVELOPMENT AND PHARMACEUTICAL SCIENCES

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ABOUT US

Vels Institute of Science, Technology & Advanced Studies (VISTAS), established in 2008, is committed to shaping individuals into well-rounded professionals with both character and competence, dedicated to nation-building and sustainable development. Recognized as a Deemed to be University by the Ministry of Human Resource Development (MHRD), Government of India, and the University Grants Commission (UGC), VISTAS offers a diverse range of undergraduate, postgraduate, and Ph.D. programs.

As a multidisciplinary university in Tamil Nadu, VISTAS provides academic programs across various fields, including Arts, Science, Engineering, Medicine, Nursing and Allied Health Sciences, Technology,Management Studies, Pharmaceutical Sciences, Physiotherapy, Maritime Studies, Education, Law, Hotel and Catering Management, Aviation, Agriculture, Music, and Fine Arts. All programs at VISTAS are accredited by the relevant statutory regulatory bodies, including the All India Council for Technical Education (AICTE), National Medical Commission (NMC), Indian Nursing Council (INC), Pharmacy Council of India (PCI), Bar Council of India (BCI), National Council for Teacher Education (NCTE), and the Directorate General of Shipping (DGS).The institution has been awarded an "A++" grade by the National Assessment and Accreditation Council (NAAC) and has been granted 12-B status by the UGC.Additionally, eleven programs have received accreditation from the National Board of Accreditation (NBA).In the NIRF University Rankings 2024, VISTAS secured a position in the 101-150 range, demonstrating its commitment to excellence in education and research. It has also been ranked in the 1201-1500 band in the Times Higher Education (THE) World University Rankings 2025 and has achieved a Diamond rating in the QS I-Gauge University Rating.

ABOUT SCHOOL

The School of Pharmaceutical Sciences was started by the Vaels Educational Trust in the year 1992 as Vels College of Pharmacy and had grown by introducing undergraduate, post graduate and Doctoral programmes in Pharmacy. In the year 2008, the college was added as a member institution to Vels Institute of Science Technology and Advanced Studies (VISTAS), DEEMED TO BE UNIVERSITY ESTD U/S 3 OF THE UGC ACT, 1956.

The School of Pharmaceutical Sciences provides excellent infrastructural facilities to carry out research on par with International standards. The Programmes offered by the school are duly approved by AICTE/ UGC/PCI. The School undertakes collaborative research projects with various organizations and hospitals. The B.Pharm degree run in this institution is duly accredited by National Board of Accreditation (NBA). It also has an approved Institutional Animal Ethics Committee framed as per the guidelines of the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) and a well-established Animal Room to cater to the experimental needs. The duly constituted Human Ethics Committee strictly follows the guidelines prescribed by ICMR and facilitates research involving human subjects. The School also runs a generic medicine store which provides the drugs at subsidized cost under Pradhan Mantri Janaushadhi Pariyojana (PMBJP) scheme.

VISION

Evolving the School into a Center of Academic and Research Excellence in Pharmaceutical Education.

MISSION

PHARMACEUTICAL CARE: To meet societal needs for safe and effective drug therapy by imparting advanced knowledge, aptitude and skills.

QUALITY EDUCATION: To provide quality education that effectively integrates outcome-based, self-learning strategies and leadership skills through practice and research.

MORAL AND ETHICAL VALUES: To inculcate core ethical values and enable the graduates to reflect human values in the health sector.

EDITOR'S DESK

It gives us immense pleasure to present the proceedings of the Indo-Korean International Conference 2026, centered on the theme "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences," held on 27th March 2026 at the Shivalaya Auditorium, Vels Institute of Science, Technology & Advanced Studies, Pallavaram, Chennai. This volume is the outcome of the dedicated efforts and commitment of the authors, speakers, and organizing team who contributed to the success of this event.

The conference saw active participation from institutions across India, reflecting a wide geographic reach and a rich diversity of perspectives that enhanced the quality of discussions. The papers included in this collection address a broad spectrum of topics, illustrating the dynamic and evolving nature of the field. Each submission has undergone a thorough peer review process to ensure high standards of quality and relevance. The research and insights presented here not only expand current knowledge but also create opportunities for future studies and collaborations.

We express our sincere gratitude to all contributors, reviewers, and members of the organizing committee for their invaluable support and dedication. This publication would not have been possible without their collective efforts. We also acknowledge with appreciation the guidance and support of our Chief Patron, patrons, convenor, organizing secretary, and co-convenors, whose contributions were instrumental in the successful execution of the conference.

As you explore these proceedings, we hope you find the content both informative and inspiring. It is our shared aspiration that the knowledge presented here will contribute meaningfully to ongoing academic discourse and encourage continued innovation and research in this field.

Thank you for your participation and continued association with our academic community.

ABOUT CONFERENCE

The Indo-Korean International Conference - 2026 Theme: "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences"

This conference is conceived as a premier academic and professional event dedicated to exploring the dynamic evolution of the pharmacy profession. The event will serve as a critical platform for Pharmacists, clinical researchers, academics, and aspiring students to engage in substantive discourse on the paradigm shift occurring within healthcare. The central tenet of the conference is to articulate and advocate for the transformation of the pharmacist's role from a traditional, product-centric function to an indispensable, patient-centric component of interprofessional healthcare teams.

The conference will feature expert-led sessions that underscore the pharmacist's expanding responsibilities in medication therapy management, comprehensive chronic disease management, and proactive public health initiatives. By fostering a collaborative environment, the conference aims to facilitate a robust exchange of knowledge and best practices. The overarching objective is to collectively define and shape the future of pharmacy by equipping the next generation of practitioners with the advanced clinical competencies, research acumen, and leadership skills essential for these expanded roles.

CONFERENCE HIGHLIGHTS & KEY TOPICS

- **Advancements in Pharmaceutical Sciences:** Showcase recent innovations in nanotechnology, drug discovery, and advanced drug delivery systems aimed at improving therapeutic outcomes.
- **Promotion of Research and Innovation:** Provide a platform for presenting cutting-edge research, encouraging collaboration, and identifying future directions in nanotechnology and pharmaceutical development.
- **Professional Development:** Offer opportunities for participants to enhance their knowledge and skills in emerging technologies and modern pharmaceutical practices.
- **Emerging Trends and Technologies:** Highlight evolving areas such as nanomedicine, targeted drug delivery, personalized medicine, and digital advancements in pharmaceutical sciences.
- **Networking and Knowledge Exchange:** Create a collaborative environment for researchers, academicians, and industry professionals to connect and share ideas.
- **Global Collaboration:** Foster international partnerships among academic institutions, research organizations, and the pharmaceutical industry to drive innovation and progress.

Message from the Chancellor's desk

Dr. Ishari K. Ganesh,
Founder–Chancellor,
VISTAS.

First, I would like to congratulate the School of Pharmaceutical Sciences, for organizing the Indo-Korean International Conference on "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences" on 27th March 2026.

This International Conference on Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences serves as a crucial platform for professionals, researchers, and stakeholders from around the globe to converge, exchange knowledge, and discuss advancements in the field of healthcare. This esteemed gathering brings together experts from various disciplines within medical and health sciences, including but not limited to medicine, nursing, pharmacology, public health, and biomedical sciences.

I believe this event will serve as a platform for students and faculties to interact and learn about recent advancements in the field. I extend my warmest wishes and greetings to all the organizers, delegates, and participants of APP - 2026, VISTAS

Message from the Pro Chancellor's desk

Dr. Arthi Ganesh,
Pro Chancellor (Academics),
VISTAS.

It is indeed an immense pleasure for me to thank the organizers for conducting the Indo-Korean International Conference on "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences" on 27th March 2026.

Such conferences typically feature keynote speeches by eminent researchers, panel discussions on cutting-edge research findings, and presentations of original research papers and posters. Participants benefit not only from the opportunity to present their work but also from networking with peers, fostering collaborations, and gaining insights into emerging trends and challenges in healthcare.

Remember to enjoy the experience and take this opportunity to learn from your fellow participants. You never know where inspiration may strike or what new ideas you may gain from networking with others.

I wish you all the very best of luck and hope that you have a successful and full filling APP - 2026, VISTAS

Message from the Pro Chancellor's desk

Dr. A. Jothi Murugan,
Pro Chancellor (Planning & Development),
VISTAS.

It gives me immense pleasure to encapsulate the Indo-Korean International Conference on "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences" on 27th March 2026. It is a platform for shaping the future of Clinical Pharmacy Practice and Research by facilitating the dissemination of new ideas, innovations in healthcare technologies, and evidence-based practices.

I encourage each and every one to utilize this opportunity and share your knowledge and network with industry professionals, and learn about the latest developments in your field.

I wish you all the very best for your presentations and hope that you will find APP - 2026, VISTAS as a valuable and rewarding experience. I wish the event a grand success.

Message from the Vice President desk

Dr. Preethaa Ganesh,
Vice President,
Vels Group of Institutions

With immense pleasure, we welcome you all to the Indo-Korean International Conference on "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences" on 27th March 2026. Organizing such an event at this point in time reinforces provides platform for researchers, scientists, healthcare professionals, and academicians to present their latest research findings and innovations. This facilitates the exchange of knowledge and ideas among participants from around the world.

VISTAS has borne the mantle of excellence, committed to ensuring the students their own space to learn, grow and broaden their horizon of knowledge by indulging in diverse spheres of learning.

These conferences play a pivotal role in shaping the future of Clinical Pharmacy Practice and Research, health sciences by facilitating the dissemination of new ideas, innovations in healthcare technologies, and evidence-based practices. They contribute significantly to the advancement of medical knowledge and ultimately aim to improve global health outcomes through collaborative efforts and shared expertise

I extend my wishes to School of Pharmaceutical sciences for supporting APP - 2026, VISTAS. I also thank all the delegates and I am confident that this conference would be a rewarding experience for all the participants.

Message from the Pro -Chancellor desk

Prof. Dr. M. Muthusamy Bhaskaran
Pro-Chancellor (Strategic Operations & Expansion)
VISTAS

I extend my heartfelt congratulations to the School of Pharmacy for organizing the Indo-Korean International Conference 2026 on "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences," scheduled for 27th March 2026. I would also like to commend the faculty members for their dedication and enthusiasm in thoughtfully emphasizing the importance of Clinical Pharmacy Practice and Research.

This conference will undoubtedly provide students with a valuable platform to explore recent scientific developments, emerging trends, and innovative approaches in the fields of medical and health sciences.

I am confident that both students and faculty members will benefit greatly from this event by gaining exposure to the latest research outcomes, technological advancements, and progressive ideas within their disciplines. Participation in presentations, workshops, and seminars will help enrich their knowledge and professional skills, which can further contribute to academic growth and improved teaching practices.

I extend my sincere best wishes and full support to all participants of APP-2026, VISTAS.

Message from the Registrar desk

Dr. T. Sasipraba
Vice-Chancellor
VISTAS

I am glad to learn that the School of Pharmaceutical Sciences at VISTAS is hosting the Indo-Korean International Conference on Clinical Pharmacy Practice and Research 2026 titled "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences" on 27th March 2026. I strongly believe that this international conference will serve as an important platform for knowledge exchange, encouraging discussion, collaboration, and innovation to address present-day healthcare challenges and improve the quality of healthcare delivery.

The diverse fields of science have significant relevance and applications in our everyday lives. I am confident that the insights, research outcomes, and new ideas shared during this conference will contribute toward developing practical scientific solutions for the challenges faced by society.

I extend my sincere best wishes to the organizing committee for the successful conduct of this event. I hope that the conference will effectively focus on current challenges, emerging developments, and key issues in medical and health sciences. Through presentations, panel discussions, and academic interactions, participants will be able to explore new perspectives and strategies to tackle these challenges.

Message from the Registrar desk

Dr. M. Chandrasekaran
Registrar
VISTAS

I am happy to note that the School of Pharmaceutical Sciences at VISTAS is organizing the Indo-Korean International Conference on Clinical Pharmacy Practice and Research 2026 on the theme “Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences” on 27th March 2026. Such initiatives that encourage global academic engagement and the sharing of scientific knowledge are truly appreciable.

This conference will provide an excellent platform for scholars, researchers, and students to exchange ideas, present their research, and deliberate on the latest developments and innovations in clinical pharmacy and pharmaceutical sciences. I am confident that these scholarly interactions will promote research excellence and contribute to addressing current healthcare challenges.

Pharmaceutical sciences, being a multidisciplinary field, play a vital role in advancing healthcare and improving the quality of life. I believe that the discussions, presentations, and collaborations during this conference will lead to meaningful insights and innovative solutions that can benefit society.

I appreciate the efforts of the organizing committee in hosting this international conference and wish them great success. I extend my best wishes to all the participants of APP-2026 at VISTAS.

Message from the convenor desk

Dr. P. Shanmugasundaram
Dean,
School of Pharmaceutical Sciences,
VISTAS

It is our pleasure to announce the Indo-Korean International Conference on "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences" on 27th March 2026, organized by our School of Pharmaceutical sciences, VISTAS.

The basic aim on this conference is to create a common platform for exchange of knowledge and research experience among the healthcare professionals. The focus is mainly on the Knowledge Exchange and Dissemination, Collaboration and Networking, Professional Development, Addressing Global Health Challenges, Promoting Research and Innovation, Policy Influence, Education and Capacity Building, Global Perspective

This conference will provide an opportunity to interact with eminent personalities to acquire the current development and challenges in the Global Scenario.

I welcome you to VISTAS - A center for learning and hope that this conference will challenge and inspire you, and result in new knowledge and collaborations.

Message from the Organizing Secretary desk

Dr. K. Karthickeyan,
Prof & Head,
Department of Pharmacy Practice,
School of Pharmaceutical Sciences,
VISTAS

Greetings from the School of Pharmaceutical Sciences, VISTAS.

The main motto of our Indo-Korean International Conference on "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences" on 27th March 2026. is to impart the knowledge of novel development. VISTAS is always pioneer in enhancing a novel ideas. This Indo-Korean International Conference is to address the needs of the budding scientists, eminent academics and structure in inculcating a necessity to share the research outcome in order to improve the knowledge and advance research in the field of Medical and health Sciences.

Hence, I expect all the delegates to cherish themselves in the research aspects. VISTAS is glad to host you all for this International Conference.

Message from the Co- Convenor desk

Dr. C. Ronald Darwin,
Prof & Head,
Department of Pharmacology,
School of Pharmaceutical Sciences,
VISTAS

It is with great pleasure and anticipation that I extend a warm welcome to each of you to the Indo-Korean International Conference on "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences" on 27th March 2026.

This conference serves as a pivotal platform for researchers, practitioners, and educators alike to exchange knowledge, share groundbreaking discoveries, and foster collaborations that will shape the future of healthcare I encourage each of you to actively participate, engage in discussions, and leverage this opportunity to forge lasting connections with peers who share our dedication to the advancement.

Message from the Co- Convenor desk

Dr. M. Sumithra,
Prof & Head,
Department of Pharmaceutical chemistry and analysis,
School of Pharmaceutical Sciences,
VISTAS

Dear Esteemed Colleagues and Participants, It is with immense pleasure and enthusiasm that I extend a warm welcome to all participants, esteemed speakers, and collaborators to the Indo-Korean International Conference on "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences" on 27th March 2026, organized by our School of Pharmaceutical sciences, VISTAS

As Co- Convenor of this distinguished gathering, I am honored to be part of an event that brings together leading minds and experts from around the world to delve into the latest advancements, challenges, and innovations.

Our conference serves as a vital platform for exchanging knowledge, forging partnerships, and driving forward the frontiers of healthcare excellence.

Together, let us harness the power of collaboration to address the complex challenges facing our field and to pave the way for a healthier future for all.

Message from the Co- Convenor desk

Dr. D. Akiladevi,
Prof & Head
Department of Pharmaceutics,
School of Pharmaceutical Sciences,
VISTAS

It is our pleasure to invite you all for this scientific occasion for the Indo-Korean International Conference on "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences" on 27th March 2026. We are delighted to welcome all our national and international delegates to participate, interact and enrich their knowledge in the field of Nanotechnology, Drug Development and Pharmaceutical Sciences.

We have taken special interest in our delegate and hence we have organized a scientific session (Oral & Poster presentation). We have received more than 150 research abstracts.
We are extremely pleased with the interest shown by our delegates to exhibit their scientific findings before the eminent scientists.

I welcome you all to use this opportunity to learn from established experts, present their research, and engage in discussions with peers.

Message from the Co- Convenor desk

Dr.Malarkodi Velraj,
Prof & Head,
Department of Pharmacognosy,
School of Pharmaceutical Sciences,
VISTAS

It is with great pleasure that I extend a warm welcome to the Indo-Korean International Conference on "Advances in Nanotechnology, Drug Development and Pharmaceutical Sciences" on 27th March 2026 organized by our School of Pharmaceutical sciences, VISTAS.

Over the course of this conference, we will explore a diverse array of topics, ranging from cutting-edge research findings to practical applications that impact global health outcomes. I am confident that the discussions and interactions among our esteemed participants will spark new ideas, collaborations, and initiatives that will shape the future of medical and health sciences.

I look forward to the productive discussions, impactful outcomes, memorable experiences enriching exchanges and meaningful collaborations that will undoubtedly emerge from our time together.

APP -VISTAS

Abstract Proceedings – 2026

BOOK EDITED AND PUBLISHED BY

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APP ABSTRACT - APP 2026 - 001

ROM ETHNOBOTANY TO ALGORIHMS: TRANSFORMING DRUG DISCOVERY THROUGH COMPUTATIONAL PHARMACOGNOSY

G. Avinash Kumar*, P. Pravallika, G. Saravanan

E-mail: dravinashreddy88@gmail.com

Abstract: The intersection of classical ethnobotanical science with computational science is transforming the trend of drug discovery using natural products. A rich, experience-based traditionally hidden depository of medicinal plant application, ethnobotany has long suffered in the translation of clinical useful therapeutics, with limitations in the areas of standardization, target identification, and mechanistic validation. Computational pharmacognosy circumvents these weaknesses by incorporating in silico software, with a spectrum between cheminformatics and molecular modeling (including machine learning and network pharmacology), into the natural products pipeline. This talk identifies a methodological conceptual framework that brings together ethnobotanical intelligence and discovery algorithms. This is done by first curating and digitizing ethnopharmacological leads into structured databases, then phytochemical profiling and generation of virtual libraries. To predict bioactivity, binding affinity and target specificity of compounds found in plants, advanced computational methods are utilised to predict them, such as quantitative structure/activity relationship (QSAR) modeling, molecular docking, and molecular dynamics simulations. At the same time, machine learning algorithms can be used to recognize patterns in large phytochemical datasets, allowing to identify new lead molecules and multi-target interactions that are typical of phytoconstituents. Moreover, network pharmacology gives a systems level insight into herb-compound-target-pathway interactions, which is consistent with polypharmacological properties of natural products. The case-based insights underscore the significance of how computational prioritization leads to the important minimization of experimental load, fastens hit-to-lead optimization, and improves the translatability. Although such developments have taken place, certain critical areas have arisen such as heterogeneity of data, poor access to quality phytochemical databases, and the requirement of quality experimental validation. In general, this integrative paradigm highlights a paradigm shift in empirical plant-based medicine to predictive, data-driven pharmacognosy. Computational pharmacognosy will provide an efficient and scalable approach to identifying next-generation therapies in nature based on its chemical diversity through the integration of traditional knowledge with the power of computation.

Keywords: Computational Pharmacognosy, Ethnobotany, Natural Product Drug Discovery, Machine Learning, Network Pharmacology

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APP ABSTRACT - APP 2026 - 002

REVISITING NATURAL PRODUCTS IN THE ERA OF PRECISION MEDICINE

P. Pravallika*, G. Avinash Kumar, G. Saravanan

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Abstract Natural products have been traditionally used as a source of drug discovery to make a significant contribution to the therapeutic arsenal in a variety of disease remedies. Nonetheless, their application in the modern precision medicine models has not been extensive because it is difficult to standardize, phytochemical composition and lacks mechanistic resolution. With the advent of precision medicine, in which treatment plans are becoming more and more differentiated and personalized depending on the genetic, molecular, and phenotypic characteristics of an individual, a strong desire to re-examine natural products in a more targeted and systems-based approach is emerging. The presentation discusses how natural products are being repurposed under precision therapeutics with the assistance of the use of omics technologies, bioinformatics, and systems pharmacology. Elevated throughput platforms e.g. genomics, transcriptomics, proteomics and metabolomics enable an extensive profiling of disease conditions, phytochemical complexity which enable the identification of individual patient-directed targets and responsive biomarkers. These datasets combined with network pharmacology techniques indicate multi-target and pathway-scale modulations that are typical of phytoconstituents, which is consistent with the polygenic characteristics of chronic diseases. Also, new approaches like metabolomics-based standardization, AI-mediated bioactive compound prediction, and biomarker-mediated clinical validation are enhancing the reproducibility and translationability of natural product studies. The case-based knowledge provides an opportunity for phytochemicals in oncology, inflammatory diseases, and metabolic diseases, where the personal response to treatment is highly important. Notably, bioavailability and target specificity are further improved by incorporation of advanced drug delivery system such as nanoformulations, to overcome conventional limitations of natural products. Although such positive shifts are evident, the main issues remain, such as regulatory complexity, inter-person differences in drug dynamics, and integrative clinical evidence models. Reinventing natural products under the paradigm of precision medicine is therefore a strategic change, as it involves the substitution of the generalized traditional use with the evidence-based and patient-specific interventions. This is a valuable strategy that rejuvenates the usefulness of pharmacognosy besides broadening the range of natural products as potentially useful, customized therapeutics in the next generation

.**Keywords:** Systems Pharmacology, Network Pharmacology, Metabolomics, Biomarker-Driven Therapy, Personalized Medicine, Omics Technologies

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APP ABSTRACT - APP 2026 - 003

GREEN & SUSTAINABLE PHARMACEUTICAL CHEMISTRY

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Abstract

Green and sustainable pharmaceutical chemistry has emerged as a transformative approach to address the environmental and economic challenges associated with conventional drug synthesis and manufacturing. Rooted in the principles of Green Chemistry, this field focuses on minimizing hazardous substances, reducing waste generation, and improving energy efficiency throughout the drug development lifecycle. Traditional pharmaceutical processes often rely on toxic reagents, non-renewable resources, and energy-intensive conditions, leading to significant environmental impact. In contrast, green pharmaceutical chemistry emphasizes the use of environmentally benign solvents, renewable feedstocks, and innovative catalytic systems to design safer and more efficient synthetic pathways. Techniques such as microwave-assisted synthesis, biocatalysis, and flow chemistry have gained prominence for their ability to enhance reaction efficiency while lowering ecological footprints. Furthermore, the integration of green chemistry principles into medicinal chemistry supports the development of safer drug molecules with reduced toxicity and improved biodegradability. Regulatory agencies and the pharmaceutical industry are increasingly adopting sustainability metrics, including E-factor and atom economy, to evaluate and optimize processes. This presentation highlights recent advances, challenges, and future perspectives in green and sustainable pharmaceutical chemistry, emphasizing its critical role in achieving environmentally responsible drug discovery and manufacturing. The adoption of these practices not only contributes to environmental protection but also enhances cost-effectiveness and innovation within the pharmaceutical sector.

Keywords: Green chemistry, sustainability, Transformative medicine, Regulatory

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STRATEGIES FOR ENHANCING DRUG BIOAVAILABILITY

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Abstract

Bioavailability is a critical pharmacokinetic parameter that determines the rate and extent to which an active pharmaceutical ingredient reaches systemic circulation. Poor bioavailability, particularly in orally administered drugs, remains a major challenge due to factors such as low aqueous solubility, poor permeability, extensive first-pass metabolism, and instability in the gastrointestinal environment. Various strategies have been developed to overcome these limitations and enhance drug bioavailability. These include formulation-based approaches such as solid dispersions, lipid-based drug delivery systems, nano formulations, and the use of permeation enhancers. Additionally, advanced techniques like prodrug design, particle size reduction, and use of novel carriers such as nanoparticles, liposomes, and micelles have shown promising results. Recent advancements in nanotechnology and targeted drug delivery systems further contribute to improved therapeutic efficacy and reduced side effects. This study highlights the key factors affecting bioavailability and discusses current and emerging strategies for its enhancement, aiming to improve drug performance and patient outcomes.

Keywords: Bioavailability, Drug delivery systems, Nanotechnology, Solid dispersion

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APP ABSTRACT - APP 2026 - 005

AI-INTEGRATED PHARMACOKINETIC OPTIMIZATION OF PH-RESPONSIVE NANOCARRIERS THROUGH SPATIOTEMPORAL MODELING OF TUMOR TARGETING

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Abstract Nanocarrier-based drug delivery systems have advantages over targeted cancer therapy. However designing them is hard because many things are connected, like particle size, zeta potential, surface changes, how well the drug is trapped and how it is released. Conventional methods for preparing these systems rely on trial and error which's not very precise and can't be easily scaled up. Artificial intelligence, machine learning and deep neural networks help model how different factors work together and predict important quality attributes. AI helps optimize nanocarrier systems, like lipid nanoparticles and polymeric nanostructures to target tumors through specific interactions and improved permeability and retention. This predictive modeling also helps understand how the drug behaves in the body improving its effectiveness and reducing side effects. With challenges like data inconsistency and understanding models, AI combined with nanotechnology is a strong platform for precise cancer treatment and better drug delivery.

Keywords: Nanotechnology, Artificial Intelligence, Nanocarriers, Targeted Drug Delivery, Pharmacokinetics, EPR Effect.

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APP ABSTRACT - APP 2026 - 006

BIOAVAILABILITY ENHANCEMENT: STRATEGIES AND ADVANCES IN DRUG DELIVERY SYSTEMS

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Abstract:

Bioavailability enhancement is a crucial area in pharmaceutical research that focuses on improving the rate and extent to which a drug reaches systemic circulation. Many drugs, particularly those classified under the Biopharmaceutics Classification System (BCS) Class I| and IV, suffer from poor aqueous solubility and low permeability, resulting in reduced therapeutic effectiveness. Enhancing bioavailability is therefore essential to achieve optimal drug performance and patient outcomes. Various approaches have been developed to address these challenges. Physical methods such as particle size reduction, micronization, and nanosizing increase the surface area, thereby improving dissolution rate. Chemical strategies including salt formation and prodrug design enhance drug solubility and stability. In addition, advanced drug delivery systems like liposomes, nanoparticles, nanoemulsions, and self-emulsifying drug delivery systems (SEDDS) have shown significant success in improving drug absorption and permeability. The use of polymers, surfactants, and permeability enhancers further contributes to enhanced drug transport across biological membranes. Bioavailability enhancement not only improves therapeutic efficacy but also reduces dose frequency and minimizes side effects, leading to better patient compliance. Continuous advancements in nanotechnology and formulation techniques are opening new opportunities for efficient and targeted drug delivery, making bioavailability enhancement an essential component of modern pharmaceutical development.

Keywords: Bioavailability, Drug Delivery Systems, Nanotechnology, Solubility Enhancement, BCS Classification, Nanoparticles, SEDDS

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APP ABSTRACT - APP 2026 - 007

PHARMACOKINETICS OF NOVEL DRUG DELIVERY SYSTEMS IN MODERN PHARMACY PRACTICE

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Abstract : Novel drug delivery systems have significantly transformed modern pharmacy practice by improving the pharmacokinetic profile of many therapeutic agents. Conventional dosage forms often face challenges such as poor absorption, rapid metabolism, and non-specific distribution. Advanced delivery systems including controlled-release formulations, liposomes, and polymeric nanoparticles help in overcoming these limitations. These systems enhance drug absorption, prolong circulation time, and ensure targeted delivery to specific tissues. Pharmacokinetics plays a crucial role in evaluating parameters such as absorption, distribution, metabolism, and excretion, which directly influence drug efficacy and safety. Preformulation studies are essential to design stable and effective drug delivery systems. In addition, advancements in medicinal chemistry and drug design support the development of optimized therapeutic agents. The integration of novel drug delivery systems with pharmacokinetic principles ensures improved patient compliance, reduced side effects, and better therapeutic outcomes.

Keywords: Pharmacokinetics, Novel Drug Delivery Systems, Controlled Release, Drug Absorption, Targeted Delivery

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APP ABSTRACT - APP 2026 - 008

ADVANCES IN BIOAVAILABILITY ENHANCEMENT STRATEGIES: FROM CONVENTIONAL APPROACHES TO NANOTECHNOLOGY-DRIVEN DRUG DELIVERY SYSTEMS

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Abstract :

Bioavailability is a key pharmacokinetic parameter that determines the rate and extent to which a drug reaches systemic circulation and becomes available at its site of action. A significant number of newly developed drug molecules exhibit poor bioavailability due to limitations such as low aqueous solubility, poor membrane permeability, extensive first-pass metabolism, and instability in the gastrointestinal environment. These challenges can lead to reduced therapeutic efficacy and increased variability in drug response. To address these issues, various bioavailability enhancement strategies have been developed. Conventional approaches include particle size reduction, salt formation, and the use of surfactants to improve drug solubility and dissolution rate. Advanced techniques such as solid dispersions, self-emulsifying drug delivery systems (SEDDS), and lipid-based formulations have shown promising results in enhancing the absorption of poorly soluble drugs. Additionally, nanotechnology-based systems like nanoparticles, liposomes, dendrimers, and polymeric micelles provide improved drug stability, targeted delivery, and controlled release profiles. Other strategies include prodrug design, which modifies the physicochemical properties of a drug to enhance absorption, and the use of permeation enhancers to improve drug transport across biological membranes. Furthermore, novel drug delivery systems can bypass first-pass metabolism and improve drug distribution. In conclusion, bioavailability enhancement is a critical aspect of pharmaceutical research and development. The integration of innovative formulation techniques and drug delivery systems has significantly improved the performance of poorly bioavailable drugs, leading to better therapeutic outcomes, reduced side effects, and enhanced patient compliance.

Keywords: Pharmaceutical Strategies, Bioavailability Enhancement, Solubility, Permeability, and Drug Delivery Innovations

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APP ABSTRACT - APP 2026 - 009

NANOPARTICLES FOR CANCER DRUG DELIVERY

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Abstract

Cancer remains one of the leading causes of death worldwide, and conventional chemotherapy often suffers from limitations such as poor selectivity, systemic toxicity, and drug resistance. Nanoparticles have emerged as a promising approach for improving cancer drug delivery by enhancing the efficiency and specificity of therapeutic agents. Nanoparticles are tiny carriers typically ranging from 1 to 100 nanometers in size and are designed to transport drugs directly to tumor tissues. Their small size and large surface area allow them to interact effectively with biological systems and improve drug solubility, stability, and bioavailability.One of the major advantages of nanoparticle-based drug delivery systems is their ability to achieve targeted therapy. Through passive targeting mechanisms such as the enhanced permeability and retention (EPR) effect, nanoparticles can accumulate preferentially in tumor tissues due to the leaky nature of tumor blood vessels. Additionally, active targeting can be achieved by attaching ligands, antibodies, or peptides on the nanoparticle surface that specifically recognize cancer cell receptors. Various types of nanoparticles, including liposomes, polymeric nanoparticles, dendrimers, and metallic nanoparticles, are being extensively studied for cancer therapy.These systems can provide controlled and sustained drug release, reduce damage to healthy tissues, and enhance therapeutic efficacy. Nanoparticle-based formulations have already shown promising results in clinical research and some have been approved for cancer treatment. Therefore, nanotechnology holds great potential in revolutionizing cancer drug delivery and improving patient outcomes in the future.

Keywords: Nanoparticles, Cancer drug delivery, Targeted therapy, Nanomedicine, Controlled drug release

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APP ABSTRACT - APP 2026 - 010

PREFORMULATION CONSIDERATIONS IN DRUG DEVELOPMENT

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Abstract : Preformulation studies constitute a crucial initial stage in drug development, focusing on the systematic evaluation of physicochemical properties of drug substances. These include solubility, stability, particle size, polymorphism, and compatibility with excipients. A comprehensive understanding of these characteristics facilitates the design of stable, safe, and effective dosage forms. Preformulation also supports the selection of appropriate formulation strategies such as solid dispersions, emulsions, and nanotechnology-based systems to enhance drug performance and bioavailability. Furthermore, these studies contribute to achieving consistent drug release profiles and improved pharmacokinetic behavior. In combination with advancements in medicinal chemistry and rational drug design, preformulation plays a key role in the development of novel drug delivery systems. Overall, it forms the foundation for efficient formulation development and successful commercialization of pharmaceutical products.

Keywords: Preformulation studies, Drug development, Bioavailability, Physicochemical properties, Drug delivery systems

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APP ABSTRACT - APP 2026 - 011

NANOTECHNOLOGY IN DRUG DELIVERY SYSTEMS IN MODERN PHARMACY PRACTICE

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Abstract

Nanotechnology has emerged as a revolutionary approach in modern pharmacy, offering innovative solutions for drug delivery systems. It involves the manipulation of materials at the nanoscale (1–100 nm) to improve therapeutic efficiency. Conventional drug delivery methods often face limitations such as poor bioavailability, rapid metabolism, and lack of target specificity. Nanotechnology-based drug delivery systems, including liposomes, polymeric nanoparticles, solid lipid nanoparticles, and dendrimers, help overcome these challenges. These systems enhance drug solubility, improve absorption, and enable controlled and targeted delivery of drugs to specific sites in the body. This targeted approach reduces side effects and increases therapeutic effectiveness. Pharmacokinetics plays a crucial role in evaluating how these nanocarriers influence drug absorption, distribution, metabolism, and excretion. Additionally, nanotechnology supports the development of personalized medicine and advanced therapies such as cancer treatment and gene delivery. Despite its advantages, challenges such as toxicity, high production cost, and regulatory issues remain. Overall, nanotechnology holds great promise in improving patient compliance and therapeutic outcomes in modern healthcare.

Keywords: Nanotechnology, Drug Delivery Systems, Nanoparticles, Targeted Delivery, Pharmacokinetics

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APP ABSTRACT - APP 2026 - 012

FRONTIERS IN PHARMACEUTICAL SCIENCES: INTEGRATING NANOTECHNOLOGY, ARTIFICIAL INTELLIGENCE, AND BIOPHARMACEUTICALS

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Abstract:

Pharmaceutical sciences represent a dynamic and interdisciplinary field dedicated to the discovery, development, formulation, and safe utilization of therapeutic agents. With the continuous advancement of science and technology, the field has witnessed significant innovations that are transforming modern healthcare. This abstract highlights key developments in drug discovery, delivery systems, and personalized medicine, emphasizing their impact on improving treatment outcomes. Recent progress in nanotechnology has enabled targeted drug delivery, enhancing bioavailability and minimizing adverse effects. Additionally, the integration of artificial intelligence in drug development has accelerated the identification of novel compounds while reducing time and cost. The emergence of biopharmaceuticals, including monoclonal antibodies and vaccines, has revolutionized the treatment of complex diseases such as cancer and autoimmune disorders. Despite these advancements, challenges such as high research costs, regulatory barriers, and drug resistance continue to hinder progress. Addressing these issues requires collaborative efforts among researchers, industry, and regulatory bodies. In conclusion, pharmaceutical sciences continue to evolve rapidly, offering innovative solutions to global health challenges. Future directions focus on precision medicine, advanced drug delivery systems, and sustainable practices, ensuring safer, more effective, and accessible therapies for patients worldwide.

Keywords: Drug discovery, Drug delivery systems, Nanotechnology, Artificial intelligence in drug development

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APP ABSTRACT - APP 2026 - 013

INTELLIGENT DRUG DELIVERY: TRANSFORMING SEDDS WITH ARTIFICIAL INTELLIGENCE

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Abstract:

Self-emulsifying drug delivery systems (SEDDS) are widely employed to enhance the oral bioavailability of poorly water-soluble drugs by promoting rapid emulsification and improved drug dissolution in the gastrointestinal tract. However, conventional formulation approaches rely on extensive trial-and-error experimentation, making the development process time-consuming and resource-intensive. The integration of artificial intelligence (AI) has emerged as a transformative strategy to optimize SEDDS formulation efficiently and accurately. AI techniques, including machine learning models such as artificial neural networks, random forest, and support vector machines, enable prediction and optimization of critical formulation parameters such as oil composition, surfactant ratio, droplet size, emulsification efficiency, and drug release behaviour. These models utilize large experimental datasets to establish relationships between formulation variables and performance outcomes, thereby facilitating rational design and minimizing experimental workload. Recent advancements demonstrate that AI-driven SEDDS can significantly enhance formulation precision, stability, and bioavailability while reducing development time and cost. Furthermore, the integration of AI with Quality by Design (QbD) principles and emerging technologies such as nano-SEDDS and 3D printing has expanded the potential for personalized drug delivery systems. Despite challenges related to data availability, model interpretability, and regulatory acceptance, AI-based optimization represents a promising approach for the future of pharmaceutical formulation. Overall, AI- driven SEDDS development offers a robust, efficient, and innovative platform for improving therapeutic efficacy and advancing modern drug delivery systems.

Keywords: Self-emulsifying drug delivery systems (SEDDS), Artificial intelligence, Machine learning, Bioavailability enhancement, Formulation optimization, Nano-emulsion, Oral drug delivery.

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APP ABSTRACT - APP 2026 - 014

DRUG-RESISTANT TUBERCULOSIS: THE INVISIBLE THREAT WE'RE IGNORING

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Abstract: Tuberculosis (TB), caused by Mycobacterium tuberculosis, remains a major global health problem despite being both preventable and curable. In recent years, the emergence of drug-resistant tuberculosis (DR-TB), including multidrug-resistant (MDR-TB) and extensively drug-resistant (XDR-TB), has become a serious challenge in controlling the disease. These resistant strains mainly develop due to incomplete treatment, improper drug use, poor patient adherence, and misuse of antibiotics.According to the World Health Organization, drug-resistant TB is a significant threat to global health and can slow down progress toward TB elimination. Compared to drug-sensitive TB, DR-TB requires longer treatment duration, more expensive drugs, and is associated with more side effects and lower success rates. This increases both the medical and economic burden on patients and healthcare systems.In countries like India, where TB burden is high, programs such as the National Tuberculosis Elimination Programme are working to control and eliminate TB. However, challenges like social stigma, delayed diagnosis, malnutrition, and limited access to healthcare still contribute to the spread of drug-resistant TB.This presentation aims to discuss the causes, transmission, and impact of DR-TB, and to emphasize the importance of early diagnosis, proper treatment adherence, rational use of antibiotics, and public awareness. Controlling this "invisible threat" requires combined efforts from healthcare professionals, government authorities, and the public.If not properly managed, drug-resistant TB may reverse the progress made in TB control and pose a serious threat to future generations. Therefore, timely and effective action is essential.

Keywords: Tuberculosis (TB), Mycobacterium tuberculosis,Incomplete treatment, antibiotic misuse, Poor adherence, Stigma & malnutrition,Early diagnosis

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APP ABSTRACT - APP 2026 - 015

MEDICINAL CHEMISTRY: DESIGN AND DEVELOPMENT OF EFFECTIVE THERAPEUTIC DRUGS

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Abstract

Medicinal chemistry is a specialized branch of science that deals with discovery, design and development of pharmaceutical drugs. It combines knowledge from organic chemistry, biochemistry and pharmacology to understand how chemical substances interact with the human body. The main aim of medical chemistry is to develop safe, effective, and affordable drugs. A key aspect of medicinal chemistry is to identify drug targets such as enzymes, receptors, or proteins that play a role in disease development. Once a suitable target is identified, researchers design and synthesize molecules that can interact specifically with it. This process involves structure-activity relationship (SAR) studies, which help in understanding how different chemical modifications affect drug activity. Medicinal chemistry plays a vital role in addressing global health challenges by developing new treatments for diseases such as cancer, infectious diseases and neurological disorders. With continuous advancements in technology and research, Medicinal chemistry remains essential in enhancing the quality of healthcare and improving patient outcomes worldwide.

Keywords: Medicinal chemistry, drug design, drug target, structure-activity relationship, molecular docking, pharmacology, drug discovery

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APP ABSTRACT - APP 2026 - 016

NANOTECHNOLOGY AND NANOMEDICINE IN PHARMACEUTICAL BIOMATERIALS

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Abstract

Nanotechnology is a rapidly advancing field of science that involves the study, manipulation and application of materials at the nanoscale typically ranging from 1 to 100 nanometers. At this small scale, materials exhibit unique physical, chemical and biological properties that differ from their large-scale counterparts. These novel properties such as increased surface area, enhanced reactivity and improved strength, make nanotechnology highly valuable across multiple disciplines. In the field of medicine, nanotechnology has revolutionized drug delivery systems by enabling targeted therapy, which ensures that drugs are delivered directly to affected cells, thereby increasing treatment efficiency and minimizing side effects. It is also used in diagnostics, imaging, and the development of advanced biomaterials. In electronics, nanotechnology has led to the miniaturization of devices, resulting in faster, more efficient, and energy-saving components such as nanoscale transistors and circuits. Furthermore, nanotechnology plays a crucial role in energy and environmental applications. It contributes to the development of high-efficiency solar cells, improved batteries, and sustainable energy solutions. In environmental protection, nanomaterials are used for water purification, air filtration, and pollution control. However, despite its vast potential, nanotechnology also raises concerns regarding toxicity, environmental impact, and ethical considerations, which require careful regulation and research. Overall, nanotechnology holds immense promise in transforming industries and improving human life in the future.

Keywords: Nanotechnology, nanoscience, medicine, targeted drug delivery, solar cell, nergy storage, technological advancement.

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APP ABSTRACT - APP 2026 - 017

BIOAVAILABILITY ENHANCEMENT OF BCS II AND APIS

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Abstract: Bioavailability is a critical parameter in pharmacokinetics that determines the rate and extent to which an active pharmaceutical ingredient (API) reaches the systemic circulation and becomes available at the site of action. Despite significant advancements in drug discovery, a large proportion of newly developed drugs exhibit poor bioavailability due to factors such as low solubility, poor permeability, extensive first-pass metabolism, and instability in the gastrointestinal environment. Enhancing bioavailability has therefore become a major focus in pharmaceutical research to ensure optimal therapeutic efficacy.Various strategies have been developed to improve the bioavailability of drugs, particularly those belonging to Biopharmaceutics Classification System (BCS) Class II and Class IV. These approaches include formulation-based techniques such as particle size reduction, solid dispersions, nanosuspensions, lipid-based drug delivery systems, and the use of surfactants and permeability enhancers. Nanotechnology-based systems like nanoparticles, liposomes, and nanoemulsions have gained significant attention due to their ability to enhance solubility, protect drugs from degradation, and facilitate targeted delivery.In addition to formulation strategies, chemical modification approaches such as prodrug formation and salt formation are widely used to improve drug absorption. The use of advanced drug delivery routes, including transdermal, buccal, nasal, and pulmonary delivery systems, also helps bypass first-pass metabolism and improve systemic availability. Furthermore, the incorporation of controlled and sustained release systems ensures prolonged drug action and reduced dosing frequency, thereby improving patient compliance. Pharmacokinetic evaluation plays a vital role in assessing bioavailability enhancement techniques by analyzing parameters such as maximum plasma concentration (Cmax), time to reach peak concentration (Tmax), area under the curve (AUC), and half-life. Advanced analytical tools and in vitro–in vivo correlation (IVIVC) models are widely employed to predict and optimize drug performance.

Key words: First pass, nano suspensions, solid dispersions, liposomes

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APP ABSTRACT - APP 2026 - 018

PHARMACOKINETICS OF NOVEL DRUG DELIVERY SYSTEMS

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Abstract:

The advancement of pharmaceutical sciences has led to the emergence of novel drug delivery systems (NDDS), which are designed to overcome the limitations of conventional dosage forms and optimize therapeutic outcomes. Pharmacokinetics plays a crucial role in evaluating the performance of these advanced systems by studying the absorption, distribution, metabolism, and excretion (ADME) of drugs within the body.Novel drug delivery systems, including nanoparticles, liposomes, microspheres, transdermal patches, and targeted delivery carriers, significantly alter the pharmacokinetic profile of drugs. These systems enhance bioavailability, improve drug stability, prolong circulation time, and enable site-specific targeting, thereby reducing toxicity and side effects. By modifying drug release patterns—such as sustained, controlled, or stimuli-responsive release—NDDS ensure a more predictable and efficient therapeutic response. Pharmacokinetic evaluation of NDDS involves advanced modeling and analytical techniques to understand parameters such as half-life, clearance, volume of distribution, and peak plasma concentration. The integration of nanotechnology and biotechnology in drug delivery has further refined pharmacokinetic behavior, enabling precision medicine and personalized therapy. Despite these advantages, challenges such as complex formulation design, variability in biological response, regulatory hurdles, and large-scale manufacturing remain significant concerns. Therefore, comprehensive pharmacokinetic studies are essential to ensure safety, efficacy, and reproducibility of these systems. In conclusion, the pharmacokinetics of novel drug delivery systems provides critical insights into drug behavior, supporting the development of more effective and safer therapeutic strategies. Continued research in this field holds great promise for revolutionizing modern medicine and improving patient outcomes.

Keywords: Pharmacokinetics, Transdermal patches, microspheres, nanoparticles

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APP ABSTRACT - APP 2026 - 019

AI-INTEGRATED PHARMACOKINETIC OPTIMIZATION OF PH-RESPONSIVE NANOCARRIERS THROUGH SPATIOTEMPORAL MODELING OF TUMOR TARGETING

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Abstract:

Recent advances in nanotechnology and artificial intelligence have helped create ways to improve how drugs work in the body. This study looks at using AI to optimize how pH-responsive panocariers work in delivering drugs to tumors. The idea is to use the acidic environment of tumors to release drugs from specially designed nanocariers, which helps prevent the drugs from being released too early in the body. Machine learning is used to understand processes of how drugs are absorbed, distributed, metabolized and excreted in the body. Key factors such as nanoparticle size, surface charge and protein corona formation are considered. The Al framework helps accurately predict drug release, distribution and uptake in tumor regions. Al also helps create dosing plans based on individual physiological differences, which is a step towards precision medicine. This approach aims to solve problems with drug delivery, such as low bioavailability and side effects. It offers a platform, for developing new targeted cancer treatments using nanotechnology.

Keywords: Al-integrated pharmacokinetics, Spatiotemporal modeling. pH-responsive nanocariers, Pharmacokinetic optimization, Precision medicine

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APP ABSTRACT - APP 2026 - 020

NANOTECHNOLOGY: A TECHNOLOGICAL ADVANCEMENT IN THE PHARMACEUTICAL DRUG DELIVERY

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Abstract: Nanotechnology is a rapidly emerging and transformative field of science that deals with the design, manipulation, and application of materials at the nanoscale, typically ranging from 1 to 100 nanometers. At this scale, materials exhibit unique mechanical, optical, electrical, and chemical properties due to quantum effects and increased surface area-to-volume ratio. These distinct characteristics enable the development of innovative solutions across multiple scientific and industrial domains. Nanotechnology is inherently interdisciplinary, combining principles from physics, chemistry, biology, materials science, and engineering. One of its most significant contributions is in the field of medicine, where it has led to advancements such as targeted drug delivery systems, nanosensors for early disease detection, cancer therapy using nanoparticles, and tissue engineering. These innovations improve treatment efficiency while minimizing side effects. In electronics, nanotechnology has enabled the miniaturization of components, leading to faster, more efficient, and energy-saving devices such as nanoscale transistors, memory chips, and flexible electronic systems. In the energy sector, nanomaterials are used to enhance the performance of solar cells, fuel cells, and batteries, thereby supporting sustainable energy solutions. Environmental applications include water purification using nanofilters, air pollution control, and remediation of toxic wastes. Furthermore, nanotechnology has applications in agriculture through nano-fertilizers and pesticides that increase crop yield while reducing environmental harm. It also plays a role in food technology by improving food packaging, safety, and shelf life. Despite its vast potential, nanotechnology raises important ethical, health, and environmental concerns. The small size of nanoparticles may pose risks such as toxicity, bioaccumulation, and unknown long-term effects on human health and ecosystems. Therefore, proper risk assessment, regulation, and responsible use are essential. In conclusion, nanotechnology represents a revolutionary approach to science and innovation, offering groundbreaking advancements that can address global challenges in healthcare, energy, environment, and industry. Continued research and development will further unlock its potential while ensuring safety and sustainability.

Keywords: Nanomedicine, Drug delivery systems, Pharmaceutical biotechnology, Nanocarriers, Targeted drug delivery

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APP ABSTRACT - APP 2026 - 021

PHARMACOKINETICS OF NOVEL DRUG DELIVERY SYSTEMS

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Abstract:

Pharmacokinetics plays a crucial role in understanding how a drug behaves inside the human body after its administration. It mainly focuses on the processes of absorption, distribution, metabolism, and excretion, commonly known as ADME. Novel drug delivery systems are specially designed technologies that deliver drugs at a controlled rate, targeted site, and desired time. One of the major advantages of NDDS is their ability to enhance drug absorption. Drugs with poor solubility or permeability can be effectively delivered using techniques such as nanoparticles, liposomes, microspheres, and nanoemulsions. Distribution of drugs is another important pharmacokinetic parameter influenced by novel drug delivery systems. Targeted drug delivery systems are designed to direct the drug specifically to the diseased tissue or organ, thereby reducing its exposure to healthy tissues. Metabolism and excretion processes are also affected by NDDS. By controlling the release rate and protecting the drug from enzymatic degradation, these systems can prolong the drug's half-life and reduce its metabolic breakdown. This leads to sustained therapeutic action and decreases the frequency of drug administration. In conclusion, novel drug delivery systems have brought significant improvements in the pharmacokinetics of drugs. By enhancing absorption, optimizing distribution, controlling metabolism, and regulating excretion, these systems ensure better therapeutic outcomes with fewer side effects.

Keywords: Phamacokinetics, absorption, liposomes, ADME

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APP ABSTRACT - APP 2026 - 022

MEDICINAL CHEMISTRY AND DRUG DESIGN: INNOVATIONS IN MODERN PHARMACEUTICAL DEVELOPMENT

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Abstract

Medicinal chemistry and drug design play a vital role in the discovery and development of new pharmaceutical agents. The process involves the identification, synthesis, and optimization of chemical compounds to improve their therapeutic effectiveness and safety. Traditional drug discovery methods are time-consuming and costly, but modern techniques such as computer aided drug design and molecular modeling have significantly accelerated the process. These approaches help in predicting drug-target interactions, enhancing selectivity, and reducing adverse effects. Preformulation studies further ensure the stability and compatibility of drug candidates before formulation. Advances in medicinal chemistry also contribute to the development of novel drug delivery systems that improve bioavailability and pharmacokinetic properties. In modern pharmacy practice, the integration of innovative drug design strategies supports the production of more effective and safer medicines, ultimately improving patient care and treatment outcomes.

Keywords: Medicinal Chemistry, Drug Design, Molecular Modelling, Drug Discovery, Pharmacokinetics

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APP ABSTRACT - APP 2026 - 023

STIMULI-RESPONSIVE NANOCARRIERS: AN EMERGING STRATEGY FOR CONTROLLED AND TARGETED DRUG DELIVERY

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bstract:

Stimuli-responsive nanocarriers have emerged as an advanced approach in novel drug delivery systems aimed at achieving controlled and site-specific drug release. These intelligent nanocarriers are engineered to respond to specific internal or external stimuli such as variations in pH, temperature, enzymatic activity, light, or magnetic fields. Upon exposure to these stimuli, the nanocarrier undergoes structural or physicochemical changes that trigger the release of the encapsulated drug at the desired target site. Such targeted release improves therapeutic efficacy while minimizing systemic toxicity and adverse effects associated with conventional drug delivery. In addition, stimuli-responsive nanocarriers can enhance pharmacokinetic properties by protecting drugs from premature degradation, prolonging systemic circulation, and enabling more precise drug distribution. These systems have demonstrated promising applications in cancer therapy, inflammatory disorders, and other chronic diseases where targeted and controlled drug delivery is essential. Recent advances in nanotechnology have facilitated the development of multifunctional nanocarriers capable of responding to multiple stimuli, thereby further improving the precision and effectiveness of drug delivery. Overall, stimuli-responsive nanocarriers represent a promising innovation in pharmaceutical sciences with the potential to significantly enhance therapeutic outcomes and optimize modern pharmacotherapy.

KEYWORDS: Stimuli-Responsive Nanocarriers, Controlled Drug Release, Targeted Drug Delivery, Nanotechnology, Novel Drug Delivery Systems

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APP ABSTRACT - APP 2026 - 024

FORMULATION DEVELOPMENT, EVALUATION AND OPTIMISATION OF DRUG-LOADED SYSTEMS FOR DISEASE TREATMENT USING DESIGN OF EXPERIMENTS (DOE)

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1. Research Scholar, Faculty of Engineering and Technology, Annamalai University, Chidambaram.
2. Associate Professor, Faculty of engineering and technology, Annamalai University, Chidambaram.
3. Principal and Professor, Department of Chemistry, Mohamed Sathak AJ College of Pharmacy, Chennai

Abstract:

The development of effective drug delivery systems plays a crucial role in improving therapeutic efficacy, safety, and patient compliance in modern pharmaceutical research. Conventional formulation approaches often rely on trial-and-error methods, which are time-consuming and may not provide optimal results. The application of Design of Experiments (DoE) offers a systematic and statistical strategy for the development, evaluation, and optimization of drug-loaded formulations for disease treatment. This review article highlights the role of DoE in pharmaceutical formulation development and its impact on enhancing drug delivery performance.DoE enables researchers to study the influence of multiple formulation and process variables simultaneously, allowing the identification of critical factors affecting product quality attributes such as drug loading, particle size, drug release profile, stability, and bioavailability. Various experimental designs, including factorial design, central composite design, and Box–Behnken design, are widely used to optimize formulation parameters efficiently. The integration of DoE with advanced drug delivery systems—such as nanoparticles, liposomes, microspheres, and polymeric carriers—has significantly improved targeted drug delivery and controlled release profiles.Furthermore, the review discusses the importance of formulation evaluation techniques, including physicochemical characterization, in vitro drug release studies, stability testing, and statistical optimization using response surface methodology. By employing DoE, researchers can reduce experimental trials, improve reproducibility, and ensure robust product development in accordance with regulatory expectations such as Quality by Design (QbD).Overall, the adoption of DoE in formulation development provides a scientific and cost-effective approach to optimize drug-loaded systems, ultimately enhancing therapeutic outcomes for the treatment of various diseases and accelerating pharmaceutical product development.

Keywords:

Design of Experiments (DoE), Formulation Development, Drug-Loaded Systems, Optimization, Drug Delivery, Quality by Design (QbD), Response Surface Methodology, Pharmaceutical Evaluation, Controlled Drug Release.

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APP ABSTRACT - APP 2026 - 025

STUDY THE EFFECT OF SUPERDISINTEGRANTS ON FAST DISSOLVING TABLETS OF TIZANIDINE HYDROCHLORIDE

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Abstract

The aim of this study is to formulate and significantly improve the bioavailability and reduce the side effects of Fast Dissolving tablets Tizanidine Hydrochloride. The precompression blends of Tizanidine Hydrochloride were characterized with respect to angle of repose, bulk density, tapped density, Carr's index and Hausner's ratio. The precompression blend of all the batches indicates well to fair flowability and compressibility. Fast Dissolving Tablets were prepared with various polymers like Sodium starch glycolate, Crospovidone, Cross carmellose sodium at different concentration ratios and were compressed in to tablets. The formulated tablets were evaluated for various quality control parameters. The tablets were passed all tests. Among all the formulations F9 formulation containing, drug and Cross carmellose sodium showed good result that is 99.50% in 35 min. Hence from the dissolution data it was evident that F9 formulation is the better formulation.

Key Words: Crospovidone, Cross carmellose sodium, Fast Dissolving Tablets, Sodium starch glycolate, Tizanidine Hydrochloride.

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APP ABSTRACT - APP 2026 - 026

DESIGN AND EVALUATION OF POLYHERBAL PEEL – OFF MASK AND FACEWASH FOR COSMECEUTICAL APPLICATIONS

***Mrs Aiswarya C S,**
Associate professor, Elims College of Pharmacy, Thrissur

Abstract:
The present study was aimed at the design and evaluation of a polyherbal peel-off mask and herbal face wash using natural extracts of 'Bougainvillea, Papaya (Carica papaya) leaves, and Pomelo (Citrus maxima) peel' for cosmeceutical applications. Ethanolic extracts of the selected herbs were prepared and subjected to preliminary phytochemical screening, which confirmed the presence of bioactive constituents. The polyherbal peel-off mask formulations (F1–F3) were prepared and evaluated for pH, viscosity, drying time, spreadability, peel-off characteristics, and antimicrobial activity. All peel-off masks showed good film-forming ability and non-irritant nature. Among them, formulation F3 demonstrated optimum viscosity, shorter drying time, excellent peel-off properties, and better antimicrobial efficacy. Rheological studies confirmed non-Newtonian pseudoplastic flow behaviour for both dosage forms. The herbal face wash formulations (F1–F3) were developed using suitable surfactants and excipients and evaluated for physiochemical parameters such as organoleptic properties, pH, viscosity, foamability, spreadability, washability, and skin irritation. All formulations showed acceptable pH and good cleansing properties; however, formulation F1 exhibited optimum viscosity, better foamability, good spreadability, and superior antimicrobial activity. Hence, F1 was identified as the optimized face wash formulation. The study concludes that the developed polyherbal pee-off mask (F3) and face wash (F1) are safe, effective, and cosmetically acceptable, indicating their potential as natural alternatives to conventional synthetic skincare products.

Keywords: Polyherbal formulation, Face wash, Peel-off mask, Bougainvillea, Carica papaya leaves, Citrus maxima peel

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APP ABSTRACT - APP 2026 - 027

STUDY THE EFFECT OF POLYMERS ON GASTRO RETENTIVE FLOATING MICROSPHERES OF DIACEREIN

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Abstract:

The research work was mainly focused on the formulation development and evaluation of floating microspheres of Diacerein as to retain the formulation for a prolonged period of time and deliver the drug to the site of absorption. The microspheres were prepared by non-aqueoussolvent evaporation method using polymer such as different concentrations of ethyl cellulose and HPMC K4M, in different ratios and Pravastatin in each formulation. The prepared microspheres were characterized by polymer compatibility (FTIR), The FTIR spectra of drug and different polymers showed no shift in peak, hence no interaction. Micromeritic properties such as Bulk density, Tapped density, Carr's index and Angle of repose. Other properties including percentage of floating buoyancy, drug entrapment efficiency, percentage of yield, in vitro drug release and SEM studies. The prepared floating microspheres were found to produce the percentage of yield was in the range of 82.7 -98.5 %, drug entrapment efficiency was 68 %-98.9 %, percentage offloating buoyancy was 70.2 - 80.6 % and in vitro drug release was 94.67 % per 12hrs. Scanningelectron microscopy (SEM) confirmed their spherical size, perforated smooth surface and ahollow cavity in them. The best drug release, entrapment efficiency and percentage of floatingbuoyancy profiles were seen with formulation F10 at the ratio of drug to polymer (HPMC K4M)of 1:5.

Keywords: Diacerein, Ethyl cellulose, Floating buoyancy, Floating Microspheres, Hydroxy Propyl Methyl Cellulose, In vitro drug release studies.

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APP ABSTRACT - APP 2026 - 028

SOLID LIPID NANOPARTICLE ENCAPSULATED BETA-CAROTENE FOR IMMUNOMODULATORY ACTIVITY: NETWORK PHARMACOLOGY, MOLECULAR DOCKING, AND INVITRO EVALUATION

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Abstract:

The present study aimed to develop and evaluate a novel solid lipid nanoparticle (SLNP)–based herbal formulation for enhanced immunomodulatory activity. Herbal bioactives often suffer from poor solubility, low bioavailability, and limited stability, which restrict their therapeutic potential. To overcome these limitations, the selected herbal extract was incorporated into SLNPs using an optimized lipid-based nanoparticulate delivery system. The formulation was prepared by a suitable method such as hot homogenization followed by ultrasonication and systematically optimized.The prepared SLNPs were characterized for particle size, polydispersity index, zeta potential, entrapment efficiency, surface morphology, and in-vitro drug release profile. Compatibility studies confirmed the absence of significant interactions between the herbal extract and excipients. The optimized formulation exhibited nanoscale particle size, good stability, high entrapment efficiency, and a sustained release pattern.Immunomodulatory activity of the developed formulation was evaluated using appropriate in-vitro and/or in-vivo models and compared with the plain herbal extract. The SLNP-based herbal formulation demonstrated enhanced immune response, indicating improved bioavailability and therapeutic performance.In conclusion, the developed SLNP-based herbal delivery system represents a promising approach for improving the immunomodulatory efficacy of herbal bioactives and may serve as a potential candidate for further preclinical and clinical investigations.

Keywords: Solid lipid nanoparticles, Herbal formulation, Immunomodulatory activity, Bioavailability enhancement, Sustained drug release

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APP ABSTRACT - APP 2026 - 029

ARTIFICIAL INTELLIGENCE IN CLINICAL PHARMACY PRACTICE: TRANSFORMING MEDICATION SAFETY AND PATIENT CARE – A NARRATIVE REVIEW

***Mrs. Arya Jayakumar**
Associate Professor, Dept. of Pharmacy Practice, Elims College of Pharmacy, Thrissur

Abstract:
The integration of Artificial Intelligence (AI) into healthcare systems has the potential to transform clinical decision-making and improve patient outcomes. In recent years, AI technologies have gained increasing attention in clinical pharmacy practice due to their abilityto analyze large volumes of health data, support evidence-based decision making, and enhance medication safety. AI-driven tools such as machine learning algorithms, clinical decisionsupport systems, and predictive analytics are increasingly being utilized to assist healthcareprofessionals in optimizing pharmacotherapy and reducing medication-related problems.This narrative review aims to explore the emerging applications of AI in clinical pharmacypractice and its potential impact on medication management and patient care. Relevantliterature published in recent years was reviewed from electronic databases including PubMed,Scopus, and Google Scholar. Studies addressing AI applications in medication error detection,adverse drug reaction prediction, therapeutic drug monitoring, dose optimization, andpersonalized medicine were considered.Evidence suggests that AI-based systems can assist clinical pharmacists in identifying drug–drug interactions, predicting adverse drug reactions, improving medication adherencemonitoring, and supporting individualized treatment decisions. Furthermore, AI technologieshave shown promise in enhancing pharmacovigilance activities and improving the efficiencyof hospital pharmacy services. Despite these advantages, challenges such as data privacyconcerns, integration with existing healthcare systems, and the need for adequate trainingamong healthcare professionals remain significant barriers.In conclusion, AI represents a promising tool for advancing clinical pharmacy practice byimproving medication safety, optimizing pharmacotherapy, and supporting patient-centeredcare. Future research and collaborative efforts are essential to ensure the effective and ethicalimplementation of AI technologies in pharmacy practice.

Keywords:Artificial Intelligence, Clinical pharmacy, Medication safety, Pharmacotherapy optimization, Personalized medicine

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APP ABSTRACT - APP 2026 - 030

NANO-ANTIBIOTICS: A NEW STRATEGY TO FIGHT ANTIBIOTICS RESISTANCE

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Abstract:
Antibiotic resistance has emerged as one of the most critical global health threats of the 21st century, rendering conventional antimicrobial therapies increasingly ineffective against multidrug-resistant (MDR) pathogens. The rise of & quot;superbugs" such as methicillin-resistant Staphylococcus aureus (MRSA), carbapenem-resistant Enterobacteriaceae (CRE), and extensively drug-resistant Mycobacterium tuberculosis demands urgent development of innovative therapeutic strategies. Nanoparticles, including liposomes, polymeric nanoparticles, silver nanoparticles, zinc oxide nanoparticles, and dendrimers, offer unique physicochemical properties that enhance antimicrobial efficacy through multiple mechanisms. These include targeted drug delivery, improved cellular penetration, disruption of bacterial biofilms, and the ability to bypass conventional resistance pathways such as efflux pumps and enzymatic drug degradation. By encapsulating antibiotics within nanocarriers, therapeutic concentrations can be achieved at infection sites while minimizing systemic toxicity and off-target effects.

Furthermore, nano-antibiotics demonstrate synergistic activity when combined with existing antibiotics, potentially restoring the efficacy of drugs rendered obsolete by resistance. Surface functionalization of nanoparticles enables pathogen-specific targeting, reducing the ecological burden of broad-spectrum antibiotic use and the consequent selective pressure that drives resistance.

Despite promising preclinical outcomes, challenges including nanotoxicity, scalability, regulatory approval, and long-term safety require rigorous investigation. Nonetheless, nano-antibiotics represent a compelling frontier in combating antimicrobial resistance, offering renewed hope for effective infection management in a post-antibiotic era.

Keywords: Antibiotic resistance, Nanoparticles, Multidrug-resistant pathogens, Targeted drug delivery, Nano-antibiotics

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APP ABSTRACT - APP 2026 - 031

DEVELOPMENT OF REGION-SPECIFIC SPIROMETRY REFERENCE STANDARDS FOR SOUTH INDIAN ADULTS: A MULTISTATE CROSS-SECTIONAL STUDY

***Megha**

SRM Medical College Hospital & Research Centre,SRM Medical College Hospital and Research Centre, SRM Nagar, Kattankulathur, Kanchipuram District (now Chengalpattu), Tamil Nadu - 603203.

Abstract:

Chronic respiratory diseases affect millions globally. COPD is the fourth leading cause of death worldwide in 2024.Spirometry is the gold standard to assess lung function. Its interpretation is based on reference values that depend on sex, age, height, and ethnicity. The ECSC reference values were used before 2012,later replaced by the Global Lung Function Initiative (GLI).This research addresses a significant problem in respiratory health: the global spirometry reference standards, NHANES III and GLI 2012, are not accurate for the South Asians. These international standards overestimate lung function in Indians leading to incorrect diagnoses and misclassification of lung health. Existing Indian reference values also show discrepancies across regions, with no specific guidelines for South Indian adults. A multi-state, community-based, cross-sectional, study will be conducted across five SouthIndian states targeting 1,000 healthy, non-smoking adults. Detailed anthropometry, demographic variables, environmental and lifestyle exposures will be recorded. Spirometric data will be collectedon FVC, FEV_1, FEV_1/FVC. Reference equations will be derived to estimate Lower Limit of Normal(LLN) and Z-scores. 10-fold internal cross-validation and external validation against global and pan-Indian standards will ensure the accuracy of models.Expected Contribution & Human Impact: A digital tool will be created for improved decision-making. The research will fill a critical gap in pulmonary diagnostics in India, ensuring clinicians have region-specific and gender-appropriate tools for spirometry assessment contributing to better respiratory health, reduced health-system burden. This study fulfils the ICMR's call for developing reference standards, making it a national priority.

Keywords: Spirometry, Chronic respiratory diseases, Reference standards, South Indian population, Lung function assessment

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APP ABSTRACT - APP 2026 - 032

DEGRADATION STUDY OF EXPIRED DRUG AND EXTANT PROPRANOLOL FORMULATION BY UV VISIBLE SPECTROSCOPY

***Muhammed Aslam, Sajna John**
Student, Elims College of Pharmacy
Associate Professor, Elims College of Pharmacy

Abstract :
Hypertension is a major health problem throughout the world because of its high prevalence and its association with increased risk of cardiovascular disease. The ultimate goal in treatment of the hypertensive patient is to achieve the maximum reduction in the long-term total risk of cardiovascular mobility and mortality.Antihypertensive drugs are used to treat high blood pressure. Propranolol is a non-cardio selective β-blocker used for the treatment of hyper- tension,pheochromocytoma, angina pectoris, myocardial infarction, and cardiac arrhythmias. Forced degradation studies are also known as stress testing, stress studies, stress decomposition studies, forced decomposition studies, etc. The present study involves the comparison of forced degradation studies such as acid and alkali hydrolytic degradation of Propranolol in their standard drug, extant and expired dosage forms. Propranolol was soluble in water so λmax of drug was identified by measuring

UV-Visible spectrum in the range of 800-200 nm in distilled water and it was found to be 291 nm. Calibration curve of drug plotted in the obtained λ max and the curves found to be linear in the selected concentration range 5-25 µg/mI.Percentage purity of extant and expired drugs was calculated. Forced degradation of the drug was performed by using 0.1M HCl and 0.1M NaOH. Degraded sample were quantified by UV-Visible spectroscopic method and the percentage degradation was calculated. In all the methods used in degradation study, expired dosage form undergoes greater degradation when compared with that of extant and standard drugs. For Propranolol, it undergoes more degradation in NaOH when compared to HCl.

Keywords: UV-Visible spectroscopy, Propranolol, extant, expired &
forced degradation.

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APP ABSTRACT - APP 2026 - 033

INTERACTION STUDY OF 5- FLUOROURACIL WITH BOVINE SERUM ALBUMIN BY UV-VISIBLE SPECTROPHOTOMETRY

***Muhammed Muhsin, Sajna John**

Student, Elims College of Pharmacy

Associate Professor, Elims College of Pharmacy

Abstract :

5-Fluorouracil (5-FU) is primary chemotherapeutic drug used for most colorectal, pancreatic and aggressive forms of breast cancers. Serum albumin is major carrier protein and its binding with drugs is important to examine the change in pharmacokinetic properties which directly influence the bio availability, sustained drug release and toxicity of drugs. The aim of the project is to perform a study on interaction of 5 -fluorouracil with bovine serum albumin employing the UV-Visible spectrophotometric method. Interaction of 5-FU with BSA has been studied systematically using UV spectroscopy by fixing the carbonate buffer of pH 7.4 as solvent and at a suitable wavelength 230 nm and 275 nm. To gain an insight into the interaction of 5-FU with BSA, the spectra of the 5-FU and BSA were examined in the absence and presence of various concentrations of the 5-FU and BSA respectively at zero minutes and repeated in 30 minutes, 60 minutes and a 90 minute time interval. The changes in peak intensity, absorbance and shift in peaks were observed. The detectable differences were recorded. This method can be used successfully for the interaction study of 5-FU with BSA. Interaction study of 5-Fluorouracil with bovine serum albumin revealed that appreciable changes in absorbance, peak area and shifts in peak were observed which may be due to binding of drug with protein BSA.

Keywords: 5-Fluorouracil; Bovine serum albumin; Chemotherapeutic; UV visible spectroscopy; Interaction study

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APP ABSTRACT - APP 2026 - 034

PHYTOCHEMICAL AND IN-VITRO ANTIOXIDANT STUDY OF ROSMARINUS OFFICINALIS EXTRACT USING ASCORBIC ACID.

Ms. Richa Pankaj Pardeshi* Dr. K G. Bhutkar

KJEI's, Trinity College of Pharmacy, Pune, 411 048

Abstract

Medicinal plants are an important source of bioactive compounds with therapeutic potential. Rosmarinus officinalis (rosemary) is widely known for its antioxidant and medicinal properties due to the presence of various phytoconstituents. The present study was carried out to evaluate the phytochemical constituents and in-vitro antioxidant activity of rosemary leaf extracts prepared using different solvents.

Fresh rosemary leaves were collected, shade-dried, and powdered. The powdered material was extracted using solvents of varying polarity such as methanol, acetone, chloroform, petroleum ether, and distilled water. The percentage yield of each extract was calculated after solvent evaporation. Preliminary phytochemical screening was performed to detect the presence of important secondary metabolites including flavonoids, phenolics, tannins, alkaloids, saponins, and terpenoids.

The antioxidant activity of the extracts was evaluated using the hydrogen peroxide scavenging assay. In this method, the ability of plant extracts to neutralize hydrogen peroxide was determined spectrophotometrically using UV analysis. Ascorbic acid was used as the reference standard for comparison of antioxidant potential. Among the tested extracts, chloroform extract showed the highest percentage yield, followed by acetone and aqueous extracts.

The results suggest that rosemary contains significant phytochemicals that contribute to its antioxidant activity. These findings support the potential use of rosemary as a natural source of antioxidant compounds which may help in reducing oxidative stress and related disorders. Further studies may help in isolating and characterizing the specific active compounds responsible for these effects.

Keywords: Isolating , distilled water, phytochemicals, terpenoids

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APP ABSTRACT - APP 2026 - 035

FORMULATION AND EVOLUTION OF HERBAL ANTIBACTERIAL FACE PACK

Ms Swarangi Bhaskar Shetye

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Abstract:

Natural remedies are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones. Herbal formulations have growing demand in the world market. The objective of this work is to formulate and evaluate a cosmetic preparation polyherbal face pack made from herbal ingredients. Kaoline, tragacanth, orange peel powder, neem powder, chandan powder, aloe juice powder, turmeric powder , Fullers earth and Cicer arientinum Powder were procured from the local market in dried, powdered and then passed through sieve no 80, mixed thoroughly prepared and evaluated for its organoleptic, physicochemical and microscopical characters . The dried powder of combined form had passable flow property which is suitable for a face pack. Herbal face packs or masks are used to stimulate blood circulation, rejuvenates and help to maintain the elasticity of the skin and remove dirt from skin pores. It is a very good attempt to establish the herbal face pack containing different powders of plants. The advantage of herbal cosmetics is their non-toxic nature, reduce the allergic reactions and time tested usefulness of many ingredients. Thus in the present work, we found good properties of the face packs and further optimization studies are required on this study to find the useful benefits of face packs on human, use as cosmetic product.

Keywords: Cicer arientinum, blood circulation, Cosmetic, Plants

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APP ABSTRACT - APP 2026 - 036

DEVELOPMENT OF NANOPARTICLES FOR TARGETED THERAPY IN OSTEOPOROSIS WITH ARTIFICIAL INTELLIGENCE-BASED DIAGNOSIS

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Abstract

Osteoporosis is a progressive skeletal disorder characterized by reduced bone mass and deterioration of bone microarchitecture, leading to increased bone fragility and fracture risk. Early diagnosis and targeted treatment are essential to prevent severe complications associated with this disease. Recent advancements in nanotechnology and artificial intelligence (AI) have opened new possibilities for improving both the diagnosis and treatment of osteoporosis.

Nanoparticles offer significant advantages in drug delivery systems by enhancing bioavailability, targeted delivery, and controlled release of therapeutic agents. Nanoparticle-based formulations such as calcium nanoparticles, polymeric nanoparticles, and lipid-based nanoparticles can deliver anti-osteoporotic drugs directly to bone tissues, thereby improving therapeutic efficiency and reducing systemic side effects.

In addition, AI-driven diagnostic systems utilize machine learning and deep learning algorithms to analyze medical imaging techniques such as Dual-energy X-ray Absorptiometry (DEXA), CT scans, and radiographic images. These AI models assist in early detection, prediction of fracture risk, and accurate assessment of bone mineral density. By integrating nanoparticle-based drug delivery with AI-assisted diagnosis, a more personalized and efficient management strategy for osteoporosis can be achieved.

This approach represents a promising advancement in modern healthcare, combining precision medicine with smart diagnostic technologies to improve patient outcomes and reduce the global burden of osteoporosis.

Key words: Osteoporosis, Nanoparticles, Artificial Intelligence (AI), Targeted drug delivery, Bone mineral density

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APP ABSTRACT - APP 2026 - 037

NANOTECHNOLOGY-ENABLED DELIVERY OF KAYAKARPAM-DERIVED PHOTOSENSITIZERS FOR CHRONO-OPTIMIZED PHOTODYNAMIC THERAPY IN CANCER

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Abstract

Cancer treatment is often limited by drug resistance, systemic toxicity, and poor tumor selectivity. Photodynamic therapy (PDT) is a minimally invasive approach that uses light-activated photosensitizers to generate reactive oxygen species (ROS) for targeted tumor destruction. Natural bioactive compounds from Siddha Kayakarpam formulations possess chromophoric structures with potential photosensitizing properties, but their clinical application is restricted by poor solubility, stability, and bioavailability. This study proposes a nanotechnology-based formulation strategy to enhance the delivery and therapeutic efficiency of Kayakarpam-derived photosensitizers. Nano-carriers such as liposomes or polymeric nanoparticles are conceptually designed to improve aqueous dispersibility, protect the photosensitizer, and enhance tumor accumulation through the enhanced permeability and retention (EPR) effect. Chronopharmacological timing is integrated to optimize photosensitizer administration and light activation according to circadian tumor physiology. Furthermore, incorporation of nanoscintillators is proposed to convert X-ray energy into visible light, enabling activation of photosensitizers in deep-seated tumors. This pharmaceutics-oriented framework highlights the potential of nanoengineered natural photosensitizers to improve PDT efficacy and address limitations in conventional cancer therapies.

Keywords: Photodynamic therapy, Nanotechnology, Kayakarpam, Photosensitizers, Cancer treatment.

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APP ABSTRACT - APP 2026 - 038

BIOAVAILABILITY ENHANCEMENT BY PRODRUG APPROACH

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Abstract:

Bioavailability is an important factor that determines the therapeutic effectiveness of a drug. Many drugs show poor bioavailability due to low solubility, poor membrane permeability, rapid metabolism, or instability in the gastrointestinal tract. The prodrug approach is an effective strategy used to improve the bioavailability of such drugs. A prodrug is a pharmacologically inactive or less active compound that is chemically modified from the parent drug and is converted into the active drug after administration through enzymatic or chemical reactions in the body.

The prodrug approach helps to overcome various pharmaceutical and pharmacokinetic limitations. It can enhance drug solubility, increase membrane permeability, reduce first-pass metabolism, and improve chemical stability. By modifying functional groups such as esters, amides, or phosphates, the physicochemical properties of the drug can be optimized to enhance absorption and distribution.

Several successful drugs have been developed using this strategy. For example, ester prodrugs are commonly used to increase lipophilicity and improve membrane transport, while phosphate prodrugs are used to enhance aqueous solubility. After absorption, these prodrugs are converted into the active drug by enzymatic hydrolysis in the body.

Therefore, the prodrug approach plays a significant role in modern drug design and pharmaceutical development. It provides an effective method to improve drug bioavailability, enhance therapeutic efficacy, and reduce side effects, ultimately leading to better patient compliance and improved treatment outcomes.

Key words: Prodrug approach, Bioavailability enhancement, Drug design, Drug metabolism, Pharmacokinetics

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APP ABSTRACT - APP 2026 - 039

ARTIFICIAL INTELLIGENCE OF DRUG DESIGN

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Abstract

Artificial Intelligence (AI) has emerged as a powerful tool in modern drug design, significantly improving the efficiency and accuracy of the drug discovery process. Traditional drug discovery is a complex, time-consuming, and expensive procedure that can take more than a decade to develop a new medicine. AI helps overcome these challenges by using advanced computational techniques such as machine learning, deep learning, and data mining to analyze large biological and chemical datasets. These technologies enable researchers to identify potential drug targets, predict molecular interactions, and design new drug candidates with improved therapeutic properties.

AI can also assist in virtual screening of thousands of compounds in a short time, helping scientists select the most promising molecules for further testing. In addition, AI models can predict pharmacokinetic and pharmacodynamic properties, toxicity, and drug–target binding affinity, which reduces the risk of failure in later stages of drug development. AI-driven approaches also support personalized medicine by analyzing patient-specific data to design targeted therapies.

Overall, the integration of Artificial Intelligence in drug design accelerates the drug discovery process, reduces research costs, and increases the probability of developing safe and effective drugs. Therefore, AI is becoming an essential tool in pharmaceutical research and development.

Key words: Artificial Intelligence (AI), Drug discovery, Drug design, Machine learning, Deep learning

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APP ABSTRACT - APP 2026 - 040

NANOTECHNOLOGY IN DRUG DELIVERY: NANOEMULSION-BASED DRUG DELIVERY SYSTEM

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Abstract

Nanotechnology has emerged as a promising approach in modern pharmaceutical research for improving drug delivery systems. Among various nanocarriers, nanoemulsions are widely used because of their small droplet size (typically 20–200 nm), high surface area, and improved drug solubility. Nanoemulsions are thermodynamically stable systems composed of oil, water, surfactant, and sometimes co-surfactant.

Nanoemulsion-based drug delivery systems enhance the bioavailability of poorly water-soluble drugs, protect drugs from degradation, and improve drug absorption. Due to their nanoscale size, they provide better penetration through biological membranes and allow targeted and controlled drug release. Nanoemulsions can be administered through various routes such as oral, topical, ocular, and parenteral, making them versatile in pharmaceutical applications.

These systems also offer advantages such as improved stability, reduced dosage frequency, enhanced therapeutic efficacy, and minimized side effects. Nanoemulsions are increasingly used for the delivery of anticancer drugs, anti-inflammatory agents, and antimicrobial compounds.

Despite their advantages, challenges such as formulation stability, surfactant toxicity, and large-scale production need to be addressed. Continuous research and development in nanotechnology will further improve nanoemulsion-based drug delivery systems.

Overall, nanoemulsions represent an effective nanotechnology-based strategy for enhancing drug solubility, bioavailability, and therapeutic performance in modern drug delivery systems.

Key words: Drug solubility enhancement, Bioavailability improvement, Targeted drug delivery, Controlled drug release

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APP ABSTRACT - APP 2026 - 041

AI-DESIGNED ESTROGEN ANALOGUES IN NANOSPONGES FOR PRECISION VAGINAL HORMONE THERAPY IN CERVICAL CANCER

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Abstract

Cervical cancer treatment is often limited by systemic toxicity and poor drug localization. This study explores a novel therapeutic approach integrating Generative AI and nanotechnology to deliver localized hormone therapy. We utilized deep learning algorithms to design novel estrogen analogues with optimized binding affinity for receptor subtypes (ER\alpha/\beta) specific to cervical malignancies.

To ensure targeted delivery, these analogues were encapsulated in β-cyclodextrin nanosponges, engineered for pH-responsive release within the vaginal microenvironment. This delivery mechanism protects the molecular stability of the analogues while providing sustained, site-specific release over 72 hours.

In silico results demonstrate that AI-optimized ligands achieve superior receptor selectivity compared to conventional hormones. By utilizing a vaginal delivery route, this method maximizes drug concentration at the tumor site while virtually eliminating systemic absorption and associated side effects. This synergy of AI-driven molecular engineering and nanosponge delivery offers a potent, minimally invasive paradigm for precision oncology, potentially improving clinical outcomes and patient quality of life in cervical cancer management.

Key words: Generative artificial intelligence (AI), Estrogen receptor (ERα/ERβ) targeting, β-cyclodextrin nanosponges, Vaginal drug delivery, pH-responsive drug release

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APP ABSTRACT - APP 2026 - 042

SYNTHETIC EXOSOME-LIKE NANOCARRIERS TRAVERSE THE BLOOD-BRAIN BARRIER IN NEURO-ONCOLOGY VIA RECEPTOR-MEDIATED TRANSCYTOSIS

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Abstract

Exosome-mimicking nanovesicles (EMNVs) emerge as a transformative nanotechnology platform in pharmacy, replicating natural exosomes (30-150 nm) to overcome the blood-brain barrier (BBB) in neuro-oncology. Engineered with lipid bilayers and surface proteins like CD63 and integrins, EMNVs leverage receptor-mediated transcytosis for 5-10-fold enhanced penetration compared to conventional nanoparticles, delivering chemotherapeutics such as doxorubicin or temozolomide directly to glioblastoma cells. Preclinical studies demonstrate superior tumor accumulation, reduced systemic toxicity, and evasion of immune clearance, with biocompatibility minimizing inflammation. Integrating phytochemicals like curcumin from Siddha medicine enables synergistic anticancer effects, aligning with pharmacognosy advancements. Theranostic potential combines therapy with real-time imaging for personalized treatment. These biocompatible carriers promise improved survival in brain malignancies, bridging traditional remedies with modern oncology. Challenges include scalable production and clinical translation, yet EMNVs herald a new era in targeted CNS pharmacotherapy

Key Words: Exosome-mimicking nanovesicles (EMNVs), Blood–brain barrier (BBB), Brain-targeted drug delivery, Glioblastoma therapy, Receptor-mediated transcytosis

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APP ABSTRACT - APP 2026 - 043

FORMULATION AND EVALUATION OF ITRACONAZOLE NAOCREAM

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Abstract

Itraconazole, a BCS class II antifungal drug, shows poor aqueous solubility and limited bioavailability. To improve its solubility and topical delivery, itraconazole nanocream formulations have been developed using nanotechnology approaches such as high-pressure homogenization. The formulation contained suitable surfactants, stabilizers, and emulsifying agents to maintain nanoparticle stability and uniform dispersion. The nanocream was evaluated for particle size, pH, viscosity, spreadability, drug content. Reported studies show that the prepared nanocrystals exhibit particle sizes between 150–400 nm with a polydispersity index of 0.15–0.30, indicating uniform distribution. The nanocrystals are incorporated into a cream base containing suitable emulsifiers and stabilizers, producing formulations with pH 5.5–6.8, viscosity 4500–8000 cps, and drug content 95–99%. These results indicate that itraconazole nanocream offers enhanced stability, improved drug release, and better antifungal therapeutic potential for topical treatment.

Key Words: Nanocream, nanocrystals, polydispersity, stability

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APP ABSTRACT - APP 2026 - 044

FORMULATION AND EVALUATION OF COLLAGEN BASED QUERCETIN CREAM

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Abstract

Wound healing is a complex biological process involving inflammation control, tissue regeneration, and collagen deposition. The present study focuses on the formulation of a topical wound healing cream incorporating quercetin and collagen as active therapeutic agents. Quercetin is a natural flavonoid well known for its antioxidant, anti-inflammatory, and antimicrobial properties, which help reduce oxidative stress and promote faster tissue repair. Collagen, an essential structural protein of the extracellular matrix, plays a vital role in cell proliferation, tissue regeneration, and wound contraction, thereby enhancing the healing process.In this formulation, quercetin was incorporated as the primary active compound while collagen was used as a co-drug to improve tissue repair and matrix formation. The cream base was prepared using oleic acid as a penetration enhancer, wool fat as an emollient, cetostearyl alcohol as a stabilizing base, and a suitable preservative to maintain microbial stability. Four formulations (F1–F4) were developed with increasing concentrations of quercetin and collagen while maintaining the total weight at 10 g.The preparation involved dissolving collagen in an acidic medium followed by incorporation of quercetin and gradual mixing into the ointment base through trituration until a uniform cream was obtained. The developed formulation is intended to enhance drug penetration, antioxidant protection, and collagen-mediated tissue regeneration, thereby accelerating the wound healing process.Overall, the quercetin–collagen cream represents a promising topical therapeutic formulation for improving wound repair, reducing inflammation, and promoting faster skin regeneration.

Key words: Antioxidant, Collagen, Trituration. Stability

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APP ABSTRACT - APP 2026 - 045

FORMULATION AND EVALUATION OF PHYTONANOPARTICLES FOR TYPE 2 DIABETES MELLITUS

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Abstract

The current study generated silver nanoparticles (AgNPs) from Allium sativum bulbs, characterized them using UV-visible spectroscopy, FT-IR, SEM, HR-TEM, and EDAX analysis, and examined how they affected the inhibition of starch digestion. The outcomes demonstrated that the biosynthesized. The spherical, uniformly distributed nanoparticles ranged in size from 10 to 30 nm. The produced AgNPs contained phenols, terpenoids, and amino acids, according to the phytochemical and FT-IR studies. The produced AgNPs were not harmful to healthy cells, according to the cytotoxicity analysis. Significant free radical scavenging activity was demonstrated by the produced AgNPs. The produced AgNPs enhanced glucose consumption, reduced hepatic glucose synthesis, and inhibited the activity of starch digestive enzymes, according to the in vitro antidiabetic efficacy. α-amylase and α-glucosidase, and they had no role in inducing the release of insulin from pancreatic cells. The silver atoms of the AgNPs interacted with the amino acid residues of α-amylase, α-glucosidase, and insulin, according to the in silico antidiabetic activity analysis (molecular docking). The current investigation shown that the AgNPs produced from A. sativum had notable antidiabetic efficacy in terms of lowering hyperglycemia by inhibiting the enzymes α-amylase and α-glucosidase, increasing glucose consumption, and decreasing hepatic glucose synthesis. Thus, it has the potential to be a useful nanomedicine for the management of diabetes.

Keywords: AgNPs, vitro antidiabetic efficacy, phytochemical

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APP ABSTRACT - APP 2026 - 046

DISCOVERY OF MULTIFUNCTIONAL HETEROCYCLIC COMPOUNDS AS MULTI-TARGET NEUROPROTECTIVE AGENTS.

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Abstract

Neurodegenerative disorders (NDs) such as Alzheimer's disease (AD) and Parkinson's disease (PD) are multifactorial pathologies involving cholinergic deficits, protein misfolding and aggregation (Aβ, tau, α-synuclein), oxidative stress, neuroinflammation, mitochondrial dysfunction, metal dyshomeostasis, and dysregulated enzymes (AChE/BChE, MAO, BACE1). The limitations of single-target drugs have motivated the design of multi-target-directed ligands (MTDLs) that intentionally combine activities against two or more relevant targets in a single molecular framework. Heterocyclic scaffolds are privileged structures in medicinal chemistry — they enable facile functionalization, tuneable physicochemical properties, and access to diverse biological activities. This project proposes to design, synthesize, characterize, and biologically evaluate novel heterocyclic scaffolds optimized as MTDLs for neuroprotection. The approach integrates computational design (docking, pharmacophore modeling, ADMET prediction), green and efficient synthetic routes for heterocycles, full structural characterization (NMR, MS, IR, elemental analysis, HPLC purity, X-ray crystallography where possible), and a panel of in vitro assays addressing enzymatic inhibition (AChE, BChE, MAO-A/B, BACE1), anti-Aβ aggregation, antioxidant capacity, metal chelation, and neuroprotection in neuronal cell lines. Promising leads will be profiled for preliminary pharmacokinetics (microsomal stability, plasma protein binding), toxicity (cytotoxicity in cell lines), and, if justified, short-term in vivo efficacy in established rodent cognitive models (e.g., scopolamine-induced amnesia). The interdisciplinary project will produce SAR data linking heterocyclic substitution patterns to multi-target activity, and aims to identify 1–2 lead candidates for further preclinical development.

Keywords: Molecular docking, Structure–activity relationship (SAR), Cholinesterase inhibition (AChE/BChE), Monoamine oxidase (MAO) inhibition, β-Amyloid aggregation

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APP ABSTRACT - APP 2026 - 047

PHYTOCHEMICAL SCREENING, ANTI-MICROBIAL EVALUATION OF EXTRACT OF SALVIA OFFICINALIS L.

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Abstract

The present study was conducted to assess the phytochemical and antimicrobial activity of extracts of Salvia officinalis L. against bacteria and fungi. This experiment was conducted to valorize Salvia officinalis post-distilled aerial parts as natural antioxidants. Total phenolic contents were determined; the phenolic constituents were determined using HPLC with UV detection. S. officinalis residues revealed phenolic diterpenes as the main components. The phytochemical test revealed the presence of proteins, carbohydrates, lipids, alkaloids, phenols, flavonoids, steroids, glycosides, tannins, terpenoids and resins. The antibacterial activity of the methanol extract shows maximum inhibition zone on Gram-positive bacteria. These results include antioxidant and antimicrobial properties. These findings suggest that S. officinalis by-products, particularly at flowering, may be considered as an interesting source of natural antioxidants and antimicrobial properties.

Keywords: Medicinal applications, herbal therapies, Salvia officinalis L., anti-microbial properties.

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APP ABSTRACT - APP 2026 - 048

GABAPENTIN AS A DUAL MODULATOR: PAIN RELIEF AND INFLAMMATORY CONTROL IN DIABETIC NEUROPATHY

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Abstract

Diabetic neuropathy remains one of the most prevalent and debilitating complications of diabetes, with pain and chronic inflammation contributing significantly to impaired quality of life. Conventional analgesics provide limited benefit, necessitating exploration of agents with both analgesic and anti-inflammatory properties. This prospective observational study evaluated the efficacy of gabapentin 200 mg in reducing inflammatory markers and pain perception in patients with diabetic neuropathy. Nineteen patients were enrolled and followed over a period of 15 days. Baseline demographics revealed a predominance of middle aged individuals, with a mean age of 51.2 years. Pain severity, assessed using the Visual Analogue Scale (VAS), demonstrated a marked reduction from a mean of 7.68 at baseline to 3.23 by day 7, with sustained improvement thereafter. Inflammatory parameters showed consistent and significant decline over the treatment course. Mean C-reactive protein levels reduced from 6.74 mg/L at baseline to 1.66 mg/L by day 15. Similarly, interleukin-6 levels decreased from 15.54 pg/mL to 4.98 pg/mL, while tumor necrosis factor-α levels dropped substantially from 35.89 pg/mL to 8.51 pg/mL over the same duration. These findings indicate that gabapentin, beyond its established role in neuropathic pain modulation, exerted a measurable anti-inflammatory effect, potentially contributing to symptom relief. The dual action observed supports its utility as an adjunctive therapy in diabetic neuropathy. However, larger randomized controlled trials are warranted to validate these preliminary findings and to elucidate the mechanistic pathways through which gabapentin mediates its anti-inflammatory effects.

Keywords: C-reactive protein (CRP), Interleukin-6 (IL-6), Tumor necrosis factor-α (TNF-α), Visual Analogue Scale (VAS)

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APP ABSTRACT - APP 2026 - 049

ASSESSING THE ANTICANCER PROPERTIES OF DIOSPYROS CHLOROXYLON EXTRACT USING COMBINED IN VITRO AND IN VIVO METHODS

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Abstract

Background: Ehrlich Ascites Carcinoma (EAC) remains a significant challenge in cancer therapy. Natural compounds have emerged as promising alternatives due to their lower toxicity and potential efficacy. This study investigates the anticancer effects of *Diospyros chloroxylon* (DC) leaf extract on EAC in vitro and in vivo.

Methods: The MTT assay was utilized to evaluate the cytotoxic effects of D. chloroxylon Roxb extract on various cancer cell lines, including EAC, A549 (lung), MCF-7 (breast), DU 145 (prostate), HT 29 (colon), as well as normal human cells (HUVECs). In the in vivo study, mice with EAC tumors were treated with two different doses (200 mg/kg and 400 mg/kg) of the extract. Parameters such as body weight, tumor volume, packed cell volume, counts of viable and non-viable cells, mean survival time, and lifespan were assessed. Additionally, hematological parameters and biochemical markers were analyzed.

Results: In MTT assay, *D. chloroxylon Roxb* extract showed selective cytotoxicity, exhibiting a strong effect on EAC cells with lower IC_{50} values than other cancer cell lines and minimal toxicity towards HUVECs. In *in-vivo*, *D. chloroxylon* Roxb treatment mitigated weight loss, reduced tumour volume in a dose-dependent manner, and improved survival times. It also normalized haematological and biochemical parameters, indicating its potential to manage cancer-induced complications.

Conclusion*:* *Diospyros chloroxylon* ability to induce cytotoxic effects selectively on cancer cells, coupled with its beneficial effects in an EAC mouse model, suggests its potential as a therapeutic agent in cancer treatment.

Keywords: *Diospyros chloroxylon,* EAC model, antitumour.

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APP ABSTRACT - APP 2026 - 050

NANO-BASED DRUG DELIVERY SYSTEMS IN MODERN PHARMACEUTICAL SCIENCES: RECENT ADVANCES AND FUTURE PERSPECTIVES

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Abstract

Conventional drug delivery systems usually have from poor aqueous solubility, limited bioavailability in many cases, non-specific tissue distribution and also systemic toxicity, which lowers the therapeutic outcomes in many acute and chronic diseases. Nano-based drug delivery systems (NDDS) had been a powerful strategy to overcome all of these limitations by enabling controlled, targeted and stimulus-responsive delivery of active pharmaceutical ingredients. This review is a summary of recent advances in pharmaceutical nanotechnology which majorly focused on major classes of NDDS, their design principles, therapeutic applications and translational challenges. Recent work highlights of sophisticated targeting ligands, stimuli-responsive release mechanisms and integration with imaging for theranostic applications. However, the challenges persist in large-scale manufacturing, long-term safety evaluation, and immunogenicity and along with study of complex regulatory pathways for Nano medicines. The overall, advances in nanotechnology are reshaping drug development and pharmaceutical care by increasing more precise and effective therapies, while harmonized regulatory frameworks and robust safety assessment are essential to fully translate NDDS from bench to bedside

Keywords: Nanotechnology, Nano medicine, Nano-based drug delivery systems, Polymeric nanoparticles, Liposomes, Solid lipid nanoparticles, Pharmaceutical sciences.

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APP ABSTRACT - APP 2026 - 051

LIPOSOMES AS NOVEL DRUG DELIVERY SYSTEMS IN PHARMACEUTICAL SCIENCES

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Abstract

Liposomes are spherical vesicular drug delivery systems composed of one or more phospholipid bilayers surrounding an aqueous core. Due to their unique structural properties, liposomes have gained significant attention in pharmaceutical research as effective carriers for both hydrophilic and lipophilic drugs. These vesicles enhance drug solubility, stability, and bioavailability while minimizing drug toxicity and improving therapeutic efficacy. The present study reviews the formulation and evaluation of liposomal drug delivery systems and highlights their potential advantages in targeted drug delivery.

Liposomes can be prepared using various techniques such as thin film hydration, reverse phase evaporation, and ethanol injection methods. The formulation variables, including lipid composition, cholesterol content, and preparation technique, play an important role in determining the physicochemical characteristics of liposomes. The prepared liposomes are evaluated for parameters such as vesicle size, polydispersity index, zeta potential, entrapment efficiency, drug release profile, and stability.

Liposomes have shown promising applications in the delivery of anticancer agents, antimicrobial drugs, vaccines, and genetic materials. Their ability to encapsulate drugs and deliver them specifically to target tissues helps reduce systemic toxicity and improve therapeutic outcomes. Furthermore, surface modification of liposomes with polymers or ligands can enhance their targeting ability and circulation time in the body.

In conclusion, liposomal drug delivery systems represent a versatile and promising approach for improving the safety and efficacy of various therapeutic agents. Continued research and development in liposome technology may lead to advanced drug delivery systems with improved clinical performance and better patient outcomes.

Keywords: Liposomes, Novel Drug Delivery Systems, Targeted Drug Delivery, Entrapment Efficiency, Zeta Potential, Nanomedicine.

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APP ABSTRACT - APP 2026 - 052

DESIGN FORMULATION AND EVALUATION OF FAST DISSOLVING TABLETS OF TOLFENAMIC ACID USING DIFFERENT SUPER DISINTEGRANTS

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Abstract

Fast dissolving tablets are gaining popularity over conventional tablets due to their convenience in administration and suitability for patients. The present study deals with the formulation of fast dissolving tablets of Tolfenamic acid using different super disintegrants. Fast dissolving tablets of Tolfenamic acid were prepared using three super disintegrants namely croscarmellose sodium, crospovidone, sodium starch glycolate with the concentrations (2%, 4%, and 6%) were prepared by wet granulation method. The dry granules were evaluated for powder flow properties, bulk density, tapped density, and compressibility index. All the formulations were evaluated for weight variation, thickness, disintegration time, dissolution, hardness, friability, wetting time and water absorption ratio. All formulations possessed good disintegration properties with average disintegration time of 36 to 48 seconds. The formulation F8 showed lowest disintegration time and more water absorption ratio. *In vitro* dissolution studies revealed that formulation F8 showed 98.7% percent drug release at the end of 25 minutes. These results revealed that the formulation F8 containing crospovidone (6%) as super disintegrant was a better one, which satisfied all the criteria as a fast dissolving tablet.

Keywords: Fast dissolving tablets (FDTs), Tolfenamic acid , Super-disintegrant, Wet Granulation, NSAID, Pain reliever, Migraine and Rheumatoid Arthritis.

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APP ABSTRACT - APP 2026 - 053

IN SILICO EVALUATION OF ANTI-DIABETIC AND IMMUNOMODULATORY ACTIVITY OF SELECTED MEDICINAL HERBS

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Abstract

Capparis species is a medicinal plant with potential therapeutic value in metabolic and immune-related disorders. The present study aimed to evaluate the ant diabetic and immunomodulatory activity of its phytoconstituents using in silicon approaches. Reported bioactive compounds were subjected to molecular docking against key antidiabetic targets such as α-glucosidase and DPP-IV, along with immunomodulatory targets including NF-κB. Binding affinity, interaction patterns, and ADMET properties were analyzed to assess drug-likeness and pharmacokinetic behavior.The results demonstrated significant binding interactions of selected compounds with target proteins, showing comparable affinity to standard drugs. ADMET predictions indicated favorable absorption and low toxicity profiles.

These findings suggest that Capparis species may serve as a promising source of bioactive compounds with dual antidiabetic and immunomodulatory potential, warranting further experimental validation.

Keywords: DPP –Dipeptidyl peptidase, Immunomodulatory,ADMET.

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APP ABSTRACT - APP 2026 - 054

ADVANCED STRATEGIES FOR ENHANCING ORAL BIOAVAILABILITY OF POORLY WATER-SOLUBLE DRUGS

Boggula Ruthika, Katta Harshitha

Bhaskar Pharmacy College, Bhaskar Nagar, Yenkapally, Moinabad [M], Himayathnagar [P.O.], R.R Dist.

Abstract

The oral bioavailability of a significant number of recently discovered therapeutic compounds is adversely affected by poor water solubility, presenting a critical challenge in pharmaceutical research. Medications categorized as Class II and Class IV in the Biopharmaceutics Classification System (BCS) often exhibit inadequate dissolution in gastrointestinal fluids, which subsequently restricts absorption and reduces therapeutic efficacy.

To address these challenges, numerous strategies for improving bioavailability have been developed. Techniques such as particle size reduction, solid dispersion systems, lipid-based formulations, and innovative drug delivery methods rooted in nanotechnology have demonstrated considerable potential for enhancing drug solubility and dissolution rates. Advanced carriers, including self-emulsifying drug delivery systems (SEDDS), liposomes, nanoparticles, and nanoemulsions, further support enhanced systemic medication absorption by improving drug permeability.

In conclusion, modern formulation techniques are crucial for overcoming solubility-related barriers and enhancing the oral bioavailability of poorly soluble medications. Ongoing research into these advanced drug delivery methods is expected to amplify therapeutic efficacy and aid in the development of more effective pharmaceutical formulations.

Key words: Bioavailability enhancement, poorly water-soluble drugs, BCS Class II drugs, Nanotechnology, Drug delivery systems.

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APP ABSTRACT - APP 2026 - 055

DEVELOPMENT, CHARACTERIZATION AND EVALUATION OF INTRANASAL DRUG DELIVERY SYSTEM

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Abstract

Neurological disorders such as Migraine and Alzheimer's disease require effective drug delivery to the brain; however, conventional oral administration often shows limited efficiency due to poor bioavailability, systemic side effects, and non-selective drug distribution. Intranasal drug delivery has emerged as a promising strategy to bypass the blood–brain barrier and provide direct nose-to-brain transport. The present study aimed to formulate and evaluate nanostructured lipid carriers (NLCs) for enhanced intranasal delivery of Sumatriptan, used in migraine management, and Astaxanthin, a potent antioxidant with neuroprotective properties for Alzheimer's disease therapy.Drug-loaded NLCs were prepared and optimized using experimental design approaches such as D-optimal design and hot high-pressure homogenization. The optimized formulations were characterized for particle size, polydispersity index (PDI), zeta potential, morphology using electron microscopy, thermal behavior, drug loading, and entrapment efficiency. Drug release studies were also conducted to determine the release kinetics of the formulations. In vivo pharmacokinetic and therapeutic evaluations were performed in Sprague–Dawley rat models, and neuropharmacokinetic parameters including drug targeting efficiency (DTE) and direct transport percentage (DTP) were calculated.The optimized NLCs exhibited nanosized particles (approximately 101–143 nm), low PDI (~0.24–0.27), high drug entrapment efficiency (around 91–94%), and stable negative zeta potential with spherical morphology. The formulations showed biphasic drug release, consisting of an initial burst followed by sustained release. Intranasal administration significantly enhanced brain targeting, with DTE reaching 258% and DTP about 61%. Additionally, NLC treatment reduced oxidative stress, neuroinflammation, amyloid-related markers, and apoptosis while improving neurotransmitter levels.NLC-based intranasal delivery significantly improved brain targeting and therapeutic efficacy, indicating its potential as an effective strategy for treating neurological disorders such as migraine and Alzheimer's disease.

Key words: Brain targeting efficiency, Neuropharmacokinetics, Drug targeting efficiency (DTE), Direct transport percentage (DTP)

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APP ABSTRACT - APP 2026 - 056

MULTI-HERBAL POWDER SPRAY FOR TOPICAL APPLICATION

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Abstract:

Medicinal plants are globally spread all over the country in India. Herbal remedies support the treatment of several physiological conditions and disorders. Skin has two key functions in addition to protection that is regulation and sensation. Wound healing is a complex and dynamic process of repairing the damaged tissue and replacing the cellular structures and tissue layers. Herbal extracts that speed up wound healing also aid in blood clotting, infection control, and wound healing. Powder spray for wound healing have primary function to serve as a protective barrier against the environment. While multi-herbal natural spray has shown promise as an alternative treatment option for wound healing of the skin, there is still a need for further research in several areas. the objective was to develop a spray formulation from *Tridax procumbens, Curcuma longa, Tagetes erecta*, and *Rosa rubiginosa*. Sprays and dusts are used to control insects, millets, and fungous and bacterial diseases of plants; insects, such as lice and flies, on animals; and weeds, using chemical weed killers or herbicides. All the ingredients that are used in the formulation are suitable and compatible with each other and they all show antimicrobial study for treatment of wound healing.

Keywords: Antimicrobial, Extracts, Formulation, Medicinal plants, Natural spray.

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APP ABSTRACT - APP 2026 - 057

PHYTOCHEMICAL ASPECTS AND DEVELOPMENT OF HERBAL COOKIES FOR TREATMENT OF OBESITY

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Abstract:

Obesity is a Multifactorial disorder of energy balance. It is characterized by an excessive Body Mass Index. If BMI is > 30 kg/m2 , it is called as obesity. Obesity leads to many multi disorders like- types-II diabetes, heart diseases, gout, sleep apnea, osteoarthritis, obesity hypoventilation syndrome etc. Obesity takes place due to lipids which are essential for healthy cell functions as long as they are not in excess amount in our body. There are three types of lipids: LDL (below 100 is optimum) HDL (above 60 it gives protection against heart diseases) and Triglycerides are stored as fats (above 150 it increases the rate of heart attack and stroke). Ant obesity drugs available in markets are such as Orlistat, Sibutramine, Amphetamine having side effects like abdominal cramp, GIT disorders, dry mouth, tachycardia, constipation, insomnia etc. So, to overcome these side effects herbal drugs are introduced as it is the oldest and most widely used system of medicine in the world today as they have less side effects and are easily available. We had formulated herbal cookies which are administered orally and degraded in stomach and it breaks the anabolism of lipid via β-Oxidation which is responsible for deposition of cholesterol in the body. The specialty of our formulation is that it increases lipolysis and energy expenditure which maintains the body weight and decreases fat absorption by preventing breakdown of dietary fat.

Keywords: High Density Lipoproteins; Multifactorial; Lipolysis; Low Density Lipoproteins; Triglycerides

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APP ABSTRACT - APP 2026 - 058

ADVANCED STRATEGIES FOR ENHANCING ORAL BIOAVAILABILITY OF POORLY WATER-SOLUBLE DRUGS

Boggula Ruthika, Katta Harshitha [PHARM.D III YEAR]

Bhaskar Pharmacy College, Bhaskar Nagar, Yenkapally, Moinabad[M], Himayathnagar [P.O.], R.R Dist.

Abstract:

The oral bioavailability of a significant number of recently discovered therapeutic compounds is adversely affected by poor water solubility, presenting a critical challenge in pharmaceutical research. Medications categorized as Class II and Class IV in the Biopharmaceutics Classification System (BCS) often exhibit inadequate dissolution in gastrointestinal fluids, which subsequently restricts absorption and reduces therapeutic efficacy.

To address these challenges, numerous strategies for improving bioavailability have been developed. Techniques such as particle size reduction, solid dispersion systems, lipid-based formulations, and innovative drug delivery methods rooted in nanotechnology have demonstrated considerable potential for enhancing drug solubility and dissolution rates. Advanced carriers, including self-emulsifying drug delivery systems (SEDDS), liposomes, nanoparticles, and nanoemulsions, further support enhanced systemic medication absorption by improving drug permeability.

In conclusion, modern formulation techniques are crucial for overcoming solubility-related barriers and enhancing the oral bioavailability of poorly soluble medications. Ongoing research into these advanced drug delivery methods is expected to amplify therapeutic efficacy and aid in the development of more effective pharmaceutical formulations.

Key words: Bioavailability enhancement, poorly water-soluble drugs, BCS Class II drugs, Nanotechnology, Drug delivery systems.

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APP ABSTRACT - APP 2026 - 059

APP ABSTRACT -APP 2026-058

NANOPARTICLE-BASED TARGETED DRUG DELIVERY IN CANCER PHARMACOTHERAPY: A CLINICAL PHARMACIST'S PERSPECTIVE ON TRANSLATIONAL OPPORTUNITIES AND PATIENT OUTCOME OPTIMIZATION

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Bhaskar Pharmacy College

Abstract:

Conventional cancer chemotherapy remains burdened by non-selective systemic toxicity, narrow therapeutic windows, and suboptimal pharmacokinetic profiles that compromise patient quality of life and treatment adherence. The emergence of nanoparticle-based drug delivery systems (NDDS) represents a paradigm shift in oncology pharmacotherapy, enabling precise spatial and temporal control of drug release at tumour sites.

This review aims to: (1) critically evaluate the major nanocarrier platforms employed in cancer drug delivery including liposomes, polymeric nanoparticles, dendrimers, and solid lipid nanoparticles; (2) analyse how nanoformulation alters key pharmacokinetic parameters — Cmax, Tmax, AUC, and elimination half-life — compared to conventional formulations; (3) assess clinically approved nanoformulations and their therapeutic outcomes; and (4) identify the pharmacist's role in optimizing nanoparticle-based cancer regimens in clinical practice.

A comprehensive literature review was conducted using PubMed, ScienceDirect, Google Scholar, and ClinicalTrials.gov databases. Studies published between 2015 and 2025 on nanoparticle-based cancer drug delivery, clinical pharmacokinetics of nanoformulations, and patient outcome data were included. Keywords used: "nanoparticles cancer drug delivery," "liposomal chemotherapy clinical outcomes," "polymeric nanoparticles oncology pharmacokinetics," and "targeted drug delivery tumor." A total of 65 peer-reviewed articles, 8 clinical trial reports, and 4 systematic reviews were analyzed. Nanoparticle-based drug delivery systems represent a transformative advancement in cancer pharmacotherapy, demonstrating measurable improvements in pharmacokinetic profiles, tumour targeting efficiency, and patient clinical outcomes. Future research should prioritise personalised nanomedicine approaches, real-world pharmacovigilance data, and clinical pharmacist-led NDDS counselling frameworks.

Keywords: Nanoparticles, Targeted Drug Delivery, Cancer Pharmacotherapy, Liposomes, Pharmacokinetics, Clinical Pharmacy, EPR Effect, Tumour Microenvironment

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APP ABSTRACT - APP 2026 - 060

PHARMACOKINETICS OF NOVEL DRUG DELIVERY SYSTEMS

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Abstract

Novel Drug delivery System (NDDS) refers to the approaches, formulations, technologies, and systems for transporting a pharmaceutical compound in the body as needed to safely achieve its desired therapeutic effects. NDDS is a system for delivery of drug other than conventional drug delivery system. NDDS is a combination of advance technique and new dosage forms which are far better than conventional dosage forms.

Pharmacokinetic Characteristics of NDDS Enhanced Absorption & Reduced Degradation: NDDS protects drugs from degradation in the gastrointestinal tract and improves absorption, resulting in better bioavailability.

Controlled and Sustained Release: Rather than the rapid peak-and-trough plasma concentrations of conventional drugs, NDDS allows for a steady, prolonged, and consistent therapeutic concentration.

Targeted Distribution: Nanocarriers can be modified to bypass biological barriers (like the blood-brain barrier) and increase accumulation. Altered Metabolism & Excretion**:** By sequestering the active ingredient, NDDS can slow the metabolism and prolong the half-life of drugs. Novel Drug Delivery Systems (NDDS) revolutionize pharmacokinetics by enabling controlled drug release, reducing degradation, and enhancing bioavailability, which leads to sustained and targeted delivery, minimized toxicity, and consistent therapeutic plasma levels within the therapeutic window.

Key words: Novel Drug Delivery Systems (NDDS), pharmacokinetics, bioavailability, controlled release, targeted delivery.

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APP ABSTRACT - APP 2026 - 061

PHARMACY PRACTICE, A GUIDE TO CLINICAL PRACTICE

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Abstract

Pharmacy practice is a vital healthcare discipline dedicated to the safe, effective, and rational use of medications to promote optimal patient health outcomes across various clinical settings. Over the years, the profession has significantly evolved from a product-focused dispensing role to a comprehensive, patient-centered model of care that integrates clinical expertise, pharmaceutical sciences, and interprofessional collaboration. Within this broader framework, clinical pharmacists have emerged as indispensable healthcare professionals who work alongside physicians, nurses, and allied health teams to design, implement, and monitor individualized medication therapy plans. They play a critical role in identifying and resolving drug-related problems, preventing adverse drug reactions, conducting medication therapy management, and ensuring therapeutic drug monitoring for optimal clinical outcomes. Clinical pharmacists also provide essential patient education on medication adherence, disease management, and lifestyle modifications, empowering patients to actively participate in their own care.

Their involvement in managing chronic conditions such as diabetes, hypertension, cardiovascular diseases, and respiratory disorders has demonstrated measurable improvements in treatment efficacy and reductions in hospital remissions. The growing integration of pharmacogenomics, evidence-based medicine, and digital health technologies continues to expand the clinical pharmacist's capacity to deliver personalized and precision-based pharmaceutical care.

Conclusion: clinical pharmacists are central to modern healthcare delivery, bridging the gap between pharmaceutical science and compassionate patient care to enhance safety, efficiency, and overall health outcomes.

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APP ABSTRACT - APP 2026 - 062

"RECENT ADVANCES IN MOUTH DISSOLVING TABLET TECHNOLOGY: A REVIEW OF FORMULATION, EVALUATION, AND INNOVATIONS

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Abstract

Mouth dissolving tablets (MDTs), also called Orally Disintegrating Tablets, are a useful type of oral dosage form that dissolves quickly in the mouth without water. They are particularly helpful for children, elderly patients, and anyone who has trouble swallowing regular tablets. This review highlights the different ways MDTs are made, their quality evaluation, and recent improvements in their technology. Common methods of preparation include direct compression, freeze-drying, sublimation, and spray drying, which help tablets disintegrate fast and deliver drugs effectively. Quality checks such as disintegration time, hardness, friability, and drug release studies are important to ensure their performance. Recently, advances like better superdisintegrants, taste-masking strategies, and modern manufacturing techniques have improved their efficiency and patient acceptability. Overall, MDTs provide a simple, convenient, and patient-friendly approach in modern drug delivery systems.

Key words Mouth Dissolving Tablets; Orally Disintegrating Tablets; Formulation; Superdisintegrants; Taste Masking; Patient Compliance

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APP ABSTRACT - APP 2026 - 063

WHEN A POTENT ANTIFUNGAL FALLS SHORT: RETHINKING ITRACONAZOLE BIOAVAILABILITY THROUGH NANOCARRIER-BASED DRUG DELIVERY

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Abstract

Successful pharmacotherapy depends not only on the pharmacological potency of a drug but also on its ability to reach adequate systemic concentrations within the body. In clinical practice, several therapeutically effective drugs face significant formulation challenges that limit their clinical performance. Itraconazole, a broad-spectrum triazole antifungal agent widely used for the treatment of systemic and superficial fungal infections, represents a notable example of such a limitation.

Itraconazole is commonly prescribed in the management of infections including aspergillosis, histoplasmosis, candidiasis, and dermatophytosis. Despite its strong antifungal activity, itraconazole exhibits extremely poor aqueous solubility. According to the Biopharmaceutics Classification System (BCS), itraconazole is categorized as a Class II drug, characterized by low solubility but relatively high membrane permeability. Because of this property, dissolution in gastrointestinal fluids becomes the rate-limiting step for drug absorption. Consequently, variations in gastric pH, food intake, and gastrointestinal physiology can significantly influence drug absorption, sometimes resulting in inconsistent plasma concentrations and variable therapeutic responses among patients.

Advances in pharmaceutical nanotechnology have introduced promising strategies to address these formulation challenges. Nanocarrier-based drug delivery systems such as liposomes, polymeric nanoparticles, solid lipid nanoparticles, and nanoemulsions have demonstrated significant potential in enhancing the dissolution and systemic availability of poorly soluble drugs.

Improving the delivery of poorly soluble drugs remains a major focus of modern pharmaceutical research. Nanocarrier-based strategies therefore represent a promising approach for optimizing itraconazole therapy and achieving more consistent therapeutic outcomes in the management of fungal infections.

Keywords: Itraconazole, Nanocarriers, Bioavailability Enhancement, Antifungal Drug Delivery, Pharmaceutical Nanotechnology.

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APP ABSTRACT - APP 2026 - 064

HPLC- UV ANALYTICAL METHOD DEVELOPMENT WITH BOX-BEHNKEN DESIGN ASSISTED OPTIMIZATION OF AURANOFIN, OXACEPROL AND TOFACITINIB IN PHARMACEUTICAL DOSAGE FORM

***Renjitha J. R[1*],**

Associate Professor, Department of Pharmaceutical Chemistry, Mount Zion College of Pharmaceutical Sciences and Research, Adoor, Kerala, India.

Abstract:

Rheumatoid Arthritis is most common Geriatric Chronic Inflammatory disease that affects the joints, an analytical method was developed for the newer medications Auranofin, Oxaceprol and Tofacitinib by High performance liquid chromatography (HPLC) and Ultra Violet (UV) spectroscopy. To develop novel analytical methods with validation and degradation analysis of newer Anti rheumatic medication. The Cary 5000 double-beam spectrophotometer was used to detect the UV absorbance. Chromatographic separation was performed in Agilent C_{18} column with a mobile phase consisting of different concentrations of methanol and phosphate buffer. Variables of the methods was optimized by response surface methodology via the Box–Behnken design using Digital expert Stat- Ease -360 software. The drugs exhibit chromatographic peak with retention periods less than 4 minutes with a clear and distinct peak for AUR, OXP and TFB detected at wavelength maximums of 232, 212 and 295 respectively. The three medications have a percentage recovery ranging from 97% to 100% w/w.

The developed method was found to be consistent and appropriate for routine screening of selected anti rheumatic drugs in bulk dosage form as well as pharmaceutical formulation.

Keywords: HPLC, UV, Auranofin, Oxaceprol, Tofacitinib, Box Behnken

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APP ABSTRACT - APP 2026 - 065

NANOSPONGES FOR DETOXIFICATION AND DRUG DELIVERY APPLICATIONS

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Abstract:

Nanotechnology has introduced advanced drug delivery systems that improve the effectiveness and safety of pharmaceutical treatments. Nanosponges are porous nanostructures capable of encapsulating various drug molecules, improving their solubility, stability, and controlled release. These structures also have the ability to absorb toxins and harmful substances from biological systems. To study the potential of nanosponges in enhancing drug delivery and their role in detoxification applications. A review of published scientific literature was conducted to analyze the structure, drug loading capacity, and therapeutic applications of nanosponges in pharmaceutical formulations. Nanosponges improve drug solubility, stability, and bioavailability while allowing controlled drug release. They also demonstrate the ability to bind toxins and harmful compounds, supporting their potential role in detoxification and safer drug therapy. Nanosponges are an innovative nanotechnology-based drug delivery system that improves drug solubility, stability, and bioavailability. Their porous structure allows controlled drug release and effective toxin absorption. Because of these advantages, nanosponges have great potential in modern pharmaceutical applications, offering safer and more efficient treatments for various diseases in the future.

Keywords: Nanosponges, Nanotechnology, Drug delivery, Detoxification, Bioavailability.

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DESIGN AND EVALUATION OF POLYHERBAL PEEL – OFF MASK AND FACEWASH FOR COSMECEUTICAL APPLICATIONS

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Abstract:

The present study was aimed at the design and evaluation of a polyherbal peel-off mask and herbal face wash using natural extracts of 'Bougainvillea, Papaya (Carica papaya) leaves, and Pomelo (Citrus maxima) peel' for cosmeceutical applications. Ethanolic extracts of the selected herbs were prepared and subjected to preliminary phytochemical screening, which confirmed the presence of bioactive constituents. The polyherbal peel-off mask formulations (F1–F3) were prepared and evaluated for pH, viscosity, drying time, spreadability, peel-off characteristics, and antimicrobial activity. All peel-off masks showed good film-forming ability and non-irritant nature. Among them, formulation F3 demonstrated optimum viscosity, shorter drying time, excellent peel-off properties, and better antimicrobial efficacy. Rheological studies confirmed non-Newtonian pseudoplastic flow behaviour for both dosage forms. The herbal face wash formulations (F1–F3) were developed using suitable surfactants and excipients and evaluated for physiochemical parameters such as organoleptic properties, pH, viscosity, foamability, spreadability, washability, and skin irritation. All formulations showed acceptable pH and good cleansing properties; however, formulation F1 exhibited optimum viscosity, better foamability, good spreadability, and superior antimicrobial activity. Hence, F1 was identified as the optimized face wash formulation. The study concludes that the developed polyherbal pee-off mask (F3) and face wash (F1) are safe, effective, and cosmetically acceptable, indicating their potential as natural alternatives to conventional synthetic skincare products.

Keywords: *Polyherbal formulation, Face wash, Peel-off mask, Bougainvillea, Carica papaya leaves, Citrus maxima peel*

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APP ABSTRACT - APP 2026 - 067

MOLECULAR DYNAMICS SIMULATION ANALYSIS OF KAEMPFEROL INTERACTION WITH TARGET PROTEIN (3HB5) FOR EVALUATING STRUCTURAL STABILITY AND BINDING INTERACTIONS.

Gopika V C,

Research Scholar, SPS, VISTAS, Chennai

Abstract:

Molecular dynamics (MD) simulation is widely used to evaluate the stability and interaction behavior of protein–ligand complexes in drug discovery. In the present study, the binding stability of the natural flavonoid **kaempferol** with the target protein **3HB5** was investigated using a 100 ns molecular dynamics simulation under NPT ensemble conditions at 300 K. The simulated system contained 21,623 atoms, including protein, ligand, water molecules, and counter ions. Structural stability of the protein–ligand complex was evaluated using parameters such as root mean square deviation (RMSD), root mean square fluctuation (RMSF), secondary structure elements (SSE), ligand torsion profile, and protein–ligand interaction analysis.

The RMSD profile indicated that the protein backbone remained stable throughout the simulation with acceptable fluctuations, suggesting equilibration of the system. RMSF analysis revealed moderate flexibility mainly in loop regions, while most secondary structural elements such as α-helices and β-strands remained stable during the trajectory. Protein–ligand interaction analysis demonstrated significant hydrogen bonding, hydrophobic contacts, and water-mediated interactions with key amino acid residues including Gly9, Ser11, Ser12, Asn90, Lys159, and Val188. These interactions contributed to the stability of the ligand within the binding pocket.

Furthermore, ligand property analysis including radius of gyration, solvent accessible surface area, polar surface area, and intramolecular hydrogen bonding confirmed conformational stability of kaempferol during the simulation period. Overall, the results suggest that kaempferol forms a stable complex with the target protein and may act as a potential bioactive compound for further drug development studies.

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APP ABSTRACT - APP 2026 - 068

LAB BENCH TO BEDSIDE: INTEGRATING RATIONAL DRUG DESIGN INTO CLINICAL PHARMACY PRACTICE

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Abstract:

The concept of "lab bench to bedside" refers to the translation of laboratory research into clinical applications that improve patient care. Rational drug design plays an important role in modern drug discovery by developing medicines based on the understanding of disease mechanisms and molecular targets. Integrating rational drug design into clinical pharmacy practice helps pharmacists better understand drug actions, optimize therapy, and improve patient outcomes. This approach bridges the gap between scientific research and clinical treatment, contributing to safer and more effective healthcare. A review of current CADD methodologies was conducted, focusing on Structure-Based (SBDD) and Ligand-Based (LBDD) drug design. The application of Molecular Docking and Quantitative Structure-Activity Relationship (QSAR) to predict drug-target interactions and toxicity profiles. The implementation of Patient-Centric Pharmaceutical Drug Product Design (PCDPD), including the development of Fixed-Dose Combinations (FDCs) and Orodispersible dosage forms to enhance adherence in special populations like the elderly and paediatric patients.

Evidence suggests that CADD significantly reduces drug failure rates in clinical trials by optimizing ADMET (Absorption, Distribution, Metabolism, Excretion, and Toxicity) parameters early in the development phase. Furthermore, integrating clinical pharmacist competencies into the design process—such as advocating for 3D-printed personalized medications or multi-particulate formulations—has been shown to improve medication persistence by addressing specific patient needs such as swallowing difficulties or complex dosing regimens. The synergy between computational drug design and clinical pharmacy practice is essential for the future of personalized medicine. By leveraging AI-driven predictive models and patient-centric formulation strategies, pharmacists can play a pivotal role in ensuring that "one-size-fits-all" approaches are replaced by high-efficacy, tailored therapeutic interventions.

Keywords: Computer-Aided Drug Design (CADD), Rational Drug Design, Pharmacy Practice, Patient-Centered Design, Clinical Pharmacy, ADMET.

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APP ABSTRACT - APP 2026 - 069

NANOTECHNOLOGY STRATEGIES TO OVERCOME THE BLOOD–BRAIN BARRIER IN NEUROLOGICAL DISEASES

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Abstract:
Neurological diseases such as Alzheimer's disease, Parkinson's disease, brain tumors, and epilepsy remain difficult to treat due to the presence of the blood–brain barrier (BBB), which restricts the entry of most therapeutic agents into the central nervous system. This study aims to review recent nanotechnology-based strategies designed to overcome the BBB and enhance targeted drug delivery for the treatment of neurological disorders. A comprehensive review of recent literature was conducted using scientific databases including PubMed, Scopus, and Google Scholar. Relevant research articles published in the last decade were analyzed to identify various nanotechnology-based drug delivery systems capable of crossing the BBB. Studies focusing on nanocarriers such as liposomes, polymeric nanoparticles, dendrimers, solid lipid nanoparticles, and nanoemulsions were evaluated, along with their mechanisms for BBB penetration, including receptor-mediated and adsorptive-mediated transcytosis. The reviewed studies indicate that nanocarriers significantly improve drug delivery to the brain by enhancing drug stability, prolonging circulation time, and enabling targeted transport across the BBB. Surface modification of nanoparticles with ligands and antibodies facilitates receptor-mediated transport, increasing therapeutic concentration in brain tissues. Nanotechnology-based systems have demonstrated promising results in delivering various therapeutic agents, including small molecules, peptides, proteins, and nucleic acids, for the management of neurological disorders. Nanotechnology offers a promising approach to overcome the limitations of conventional drug delivery systems in treating neurological diseases. Advanced nanocarriers can effectively bypass or penetrate the BBB, improving therapeutic outcomes and reducing systemic side effects. However, further research is required to address safety concerns, optimize nanoparticle design, and facilitate clinical translation of these technologies.

Keywords: Nanotechnology, Blood–Brain Barrier, Nanocarriers, Neurological Diseases, Drug Delivery, Targeted Therapy.

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APP ABSTRACT - APP 2026 - 070

DoE-ORIENTED ISOCRATIC HPLC OPTIMIZATION OF AZOLE ANTIFUNGALS IN COMBINED PHARMACEUTICAL DOSAGE FORM

***Ms. Jisha M S**

Mount Zion College of pharmaceutical Sciences and Research

Abstract:

A simple, consistent and reasonable isocratic RP-high performance liquid chromatography (RP-HPLC) approach was developed and optimized for the concurrent determination of Ornidazole and Miconozole in bulk and tablet dosage forms. HPLC analysis illustrated satisfactory separation of Ornidazole and Miconozole and optimal resolution was attained with C18 column using methanol, 5mM Ammonium acetate in the ratio 40:60 v/v at pH 4.8 as the mobile phase and UV detection at 276 nm. A unique chromatogram and spectra for Ornidazole and Miconozole were able to be envisioned by developed methods, which are analogous to the sample results. The calibration curve's observed linearity for ORZ and MCZ at selected concentration range. Recovery studies investigated the approach's accuracy with percentage recovery ranges between 97.33% and 98.33%. The developed techniques were verified in terms of precision, accuracy and linearity. Quality by design (QbD) was employed to optimize the accurate ratio mobile phase, pH, flow rate and its impact on retention time and peak area. The validation outcomes met the acceptance criteria as per ICH recommendations and found to be reliable for the routine examination of drugs in therapeutic formulations. The developed methodology can be used for quantitative determination of Ornidazole and Miconozole combination in pharmaceutical formulations without the immersion of additional diluents or excipients.

Keywords:

Ornidazole; Miconazole; RP-HPLC; Isocratic method; Method development; Method validation; C18 column; Quality by Design (QbD); ICH guidelines; Pharmaceutical analysis; Simultaneous estimation; Tablet dosage form.

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APP ABSTRACT - APP 2026 - 071

BINDING-ENHANCING MOLECULES: A NOVEL STRATEGY TO IMPROVE DRUG–PROTEIN INTERACTIONS IN MODERN PHARMACOTHERAPY

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Abstract:

Drug–protein interactions are fundamental to the efficacy, selectivity, and safety of pharmacological therapies. Traditional drug discovery primarily focuses on designing molecules that directly bind to specific protein targets to modulate biological activity. However, many therapeutic targets remain difficult to influence due to weak binding affinity, low selectivity, or the absence of well-defined binding sites. To address these challenges, the concept of binding-enhancing molecules has emerged as a promising strategy in modern drug design. These molecules improve or stabilize interactions between drugs and their target proteins, thereby enhancing pharmacological effects.

Binding-enhancing molecules function by facilitating or strengthening the interaction between a drug and its protein target. Rather than acting independently like conventional drugs, they may serve as molecular bridges or modulators that stabilize the drug–protein complex. This mechanism can increase binding affinity and prolong the duration of interaction, potentially improving drug potency and reducing the required dosage. Consequently, this approach may help minimize adverse effects and enhance therapeutic selectivity.

Recent advances in medicinal chemistry have highlighted the importance of strategies such as molecular glues and bifunctional molecules that promote or stabilize protein interactions. These approaches have demonstrated considerable potential in targeting disease-related proteins, particularly in complex conditions such as cancer and metabolic disorders.

In conclusion, binding-enhancing molecules represent an innovative direction in pharmacotherapy. By strengthening drug–protein interactions and improving target specificity, this strategy offers promising opportunities for the development of more effective and precise therapeutic agents in the future.

Keywords: binding-enchancing proteins, proteomics, protien binding sites, drug discovery, pharmacotherapy

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APP ABSTRACT - APP 2026 - 072

ARTIFICIAL INTELLIGENCE-DRIVEN EARLY WARNING SYSTEMS IN TELE-ICU FOR SEPSIS PREDICTION

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Abstract:

Sepsis is a potentially life-threatening condition and a leading cause of death in intensive care unit (ICUs) worldwide. Early recognition and proper management are essential for improving survival rates. Tele-ICU technology allows for the remote monitoring of critically ill patients through continuous streaming of physiological and clinical information. The application of Artificial Intelligence (AI) technology to Tele-ICU technology has greatly improved early warning systems through predictive analytics and real-time decision support.

AI-powered early warning systems employ machine learning algorithms to analyse large amount of patient data, including vital signs, lab values, and electronic health records. The algorithms detect subtle changes in physiological patterns that may suggest early sepsis, often before the onset of clinical manifestations. Studies have demonstrated that AI-powered predictive models can predict sepsis hours before the current standards of assessment, allowing for immediate antibiotic and hemodynamic therapy.

In the Tele-ICU environment, AI technology improves remote patient monitoring by automatically detecting high-risk patients and notifying healthcare professionals, thus improving response time and alleviating the workload of healthcare professionals. The application of AI technology has been linked to lower ICU mortality rates, shorter hospital stays, and efficient resource utilization.

Although there are benefits, there are still issues that need to be addressed, including the problem of data privacy, transparency of algorithms, integration of the system into practice, and regulation of the system.

Keywords: *Artificial Intelligence, Tele-ICU, Sepsis Prediction, Early Warning System.*

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APP ABSTRACT - APP 2026 - 073

DEVELOPMENT, CHARACTERIZATION AND EVALUATION OF INTRANASAL DRUG DELIVERY SYSTEM

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Abstract:

Neurological disorders such as Migraine and Alzheimer's disease require effective drug delivery to the brain; however, conventional oral administration often shows limited efficiency due to poor bioavailability, systemic side effects, and non-selective drug distribution. Intranasal drug delivery has emerged as a promising strategy to bypass the blood–brain barrier and provide direct nose-to-brain transport. The present study aimed to formulate and evaluate nanostructured lipid carriers (NLCs) for enhanced intranasal delivery of Sumatriptan, used in migraine management, and Astaxanthin, a potent antioxidant with neuroprotective properties for Alzheimer's disease therapy.Drug-loaded NLCs were prepared and optimized using experimental design approaches such as D-optimal design and hot high-pressure homogenization. The optimized formulations were characterized for particle size, polydispersity index (PDI), zeta potential, morphology using electron microscopy, thermal behavior, drug loading, and entrapment efficiency. Drug release studies were also conducted to determine the release kinetics of the formulations. In vivo pharmacokinetic and therapeutic evaluations were performed in Sprague–Dawley rat models, and neuropharmacokinetic parameters including drug targeting efficiency (DTE) and direct transport percentage (DTP) were calculated.The optimized NLCs exhibited nanosized particles (approximately 101–143 nm), low PDI (~0.24–0.27), high drug entrapment efficiency (around 91–94%), and stable negative zeta potential with spherical morphology. The formulations showed biphasic drug release, consisting of an initial burst followed by sustained release. Intranasal administration significantly enhanced brain targeting, with DTE reaching 258% and DTP about 61%. Additionally, NLC treatment reduced oxidative stress, neuroinflammation, amyloid-related markers, and apoptosis while improving neurotransmitter levels.NLC-based intranasal delivery significantly improved brain targeting and therapeutic efficacy, indicating its potential as an effective strategy for treating neurological disorders such as migraine and Alzheimer's disease.

Key words: Brain targeting efficiency, Neuropharmacokinetics, Drug targeting efficiency (DTE), Direct transport percentage (DTP)

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APP ABSTRACT - APP 2026 - 074

IN SILICO IDENTIFICATION OF NOVEL PYRAZOLE DERIVATIVES AS POTENT ANTICANCER AGENTS TARGETING KDM5 PROTEIN

Mrs Minnu Joy,

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Abstract:

Lung cancer is the leading cause of cancer-related deaths worldwide, with approximately 2.48 million new cases annually. The disease develops through genetic and epigenetic changes that allow cells to grow uncontrollably. KDM5A and KDM5B, a histone demethylase enzyme, is overexpressed in 5-15% of lung cancer cases and promotes tumor growth, spread and resistance to treatment by silencing tumor suppressor genes. Celecoxib, a commonly used anti-inflammatory drug containing a pyrazole structure, has shown promising anticancer effects by inhibiting both COX-2 and KDM5A and KDM5B enzymes. However, its clinical use is limited due to cardiovascular side effects caused by its chemical structure, particularly the sulfonamide moiety. This study aims to design safer and more effective pyrazole-based anticancer drugs using computer-aided drug design methods. We will use molecular docking to predict how modified pyrazole compounds bind to KDM5A and KDM5B, calculate their binding strength using MM-GBSA analysis and evaluate their drug-like properties and safety through ADMET profiling. By making specific chemical modifications such as replacing toxic groups with safer alternatives and reducing fat solubility we hope to create new compounds that specifically target KDM5A and KDM5B with improved anticancer activity and fewer heart-related side effects. The promising candidates identified through this computational approach will provide a foundation for developing new targeted therapies for lung cancer treatment.

Keywords: Pyrazole derivatives, KDM5A inhibitors, lung cancer, computer-aided drug design, molecular docking, anticancer agents

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APP ABSTRACT - APP 2026 - 075

QBD BASED ANALYTICAL OPTIMIZATION BY UV SPECTROSCOPY ASSISTED HPLC AND HPTLC METHODS FOR QUANTIFICATION OF VOCLOSPORIN IN PHARMACEUTICAL FORMULATION

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Abstract:

The innovative analytical quantification of lupus medication Voclosporin was developed by HPLC, and HPTLC was abetted by the Ultra Violet spectroscopic method using the QbD approach. **Materials and Methods:** The Cary 5000 double-beam spectrophotometer was used to measure the UV absorbance. Chromatographic separation was performed in the Agilent C_{18} column with mobile phase consisting of different concentrations of Acetonitrile and phosphate buffer. Variables of the methods were optimized by response surface methodology via the Box-Behnken design using Digital expert Stat- Ease -360 software. HPTLC determination was carried out using Camag Linomet with densitometric scanner. The methods were verified as per ICH requirements, the stability of the drugs were considered under a forced stress environment, and observed for transitional degradation pattern. **Results:** The drug exhibits HPLC and HPTLC chromatographic peaks with retention periods of 6.18 and 5.61 min respectively with a clear and distinct peak for Voclosporin detected at wavelength maximums of 248 nm. The medication showed a percentage recovery ranging from 97% to 100% w/w. **Conclusion:** The developed method was found to be consistent and appropriate for repetitive screening of drugs in bulk dosage form as well as pharmaceutical formulation.

Keywords: Voclosporin, HPLC, UV, HPTLC, Quality by Design, Multiple Sclerosis.

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APP ABSTRACT - APP 2026 - 076

FORMULATION AND EVALUATION OF *PSIDIUM GUAJAVA* LEAF EXTRACT GEL FOR SKINCARE.

Mr Anand P,

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Abstract:

The skin, the largest organ of the human body, plays a vital role in protection, regulation, and maintenance of physiological balance. Growing interest in herbal and natural skincare products has encouraged the exploration of plant-derived bioactive compounds with therapeutic potential. Psidium guajava L. (guava) leaves are known to contain various phytochemicals such as flavonoids, phenolics, tannins, and antioxidants, which possess antimicrobial, anti-inflammatory, wound-healing, and antioxidant properties.

The present study focuses on the formulation and evaluation of a topical herbal gel incorporating ethanolic extract of Psidium guajava leaves for skincare applications. The extract was subjected to phytochemical screening, which confirmed the presence of alkaloids, flavonoids, tannins, saponins, and phenolic compounds. A gel formulation was developed and evaluated for its physicochemical properties including colour, odour, consistency, pH, viscosity, spreadability, homogeneity, and skin irritation potential.

The formulated gel showed satisfactory organoleptic characteristics, good spreadability, suitable pH (5.8), and appropriate viscosity with pseudoplastic behaviour. No signs of skin irritation were observed, indicating good safety and compatibility with the skin. Quantitative phytochemical analysis revealed considerable total phenolic and flavonoid content. Furthermore, antioxidant activity evaluated using the DPPH assay demonstrated strong free radical scavenging activity in a concentration-dependent manner.

Overall, the results suggest that the Psidium guajava leaf extract-based gel is a stable, safe, and effective topical formulation with promising antioxidant and dermatological benefits, highlighting its potential application in herbal skincare products.

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APP ABSTRACT - APP 2026 - 077

COMPARATIVE GC–MS/MS ANALYSIS AND METHOD VALIDATION FOR IDENTIFICATION OF PESTICIDE RESIDUES IN PADDY FIELD WATER SAMPLES USING STANDARD CHROMATOGRAPHIC

Sajna John
Associate Professor
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Abstract:

The extensive use of pesticides in paddy cultivation has raised serious concerns regarding environmental contamination and associated human health risks. The present study focuses on the identification and comparative analysis of pesticide residues in water samples collected from paddy field ecosystems using Gas Chromatography–Tandem Mass Spectrometry (GC–MS/MS). Standard solutions of commonly used organophosphorus pesticides were first analyzed to establish reference retention times and characteristic chromatographic patterns for accurate identification. These standard chromatograms served as analytical references for comparison with the chromatographic profiles obtained from environmental samples.

Water samples collected from paddy fields were subjected to liquid–liquid extraction using dichloromethane, followed by purification with anhydrous sodium sulphate and concentration using a rotary evaporator. The concentrated extracts were filtered and analyzed using GC–MS/MS equipped with an HP-5MS column under optimized operating conditions.

Method validation parameters such as linearity, precision, sensitivity, and reproducibility were evaluated to ensure the reliability of the analytical method. Calibration curves for the standard pesticides showed good linearity within the selected concentration range with satisfactory correlation coefficients. The analytical method demonstrated adequate sensitivity for detecting trace levels of pesticide residues.

Comparative evaluation of sample chromatograms with those of the standard pesticides revealed peaks corresponding to similar retention times, suggesting the presence of quinalphos, dimethoate, malathion, methyl parathion, and chlorpyrifos. The study highlights the effectiveness of GC–MS/MS as a reliable technique for monitoring pesticide contamination in agricultural environments.

Keywords: GC–MS/MS, Pesticide Residues, Paddy Field Water, Organophosphorus Pesticides, Chromatographic Comparison, Environmental Monitoring.

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APP ABSTRACT - APP 2026 - 078

ASSESSMENT OF MEDICATION ADHERENCE IN PATIENTS WITH HYPERTENSION

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Abstract:

Background**:** Hypertension is one of the most common chronic cardiovascular disorders and a major risk factor for complications such as stroke, myocardial infarction, and heart failure. Despite the availability of effective antihypertensive medications, poor medication adherence remains a significant challenge in achieving optimal blood pressure control. Assessing adherence patterns among hypertensive patients can help identify barriers and improve therapeutic outcomes.

Aim: To assess the level of medication adherence among patients diagnosed with hypertension and identify factors influencing adherence.

Objective:

To evaluate medication adherence among hypertensive patients using a validated adherence assessment tool

To identify factors associated with poor adherence to antihypertensive therapy.

To assess the relationship between medication adherence and blood pressure control.

Methodology: A prospective observational study was conducted among hypertensive patients attending the outpatient department of a tertiary care hospital. Medication adherence was assessed using a structured questionnaire and the Morisky Medication Adherence Scale (MMAS-8). Demographic data, clinical characteristics, and treatment details were collected from patient interviews and medical records.

Results: A total of 120 hypertensive patients were included in the study. Among them, 42% showed high medication adherence, 33% moderate adherence, and 25% low adherence. Factors such as poly pharmacy, lack of disease awareness, forgetfulness, and medication cost were significantly associated with poor adherence. Patients with higher adherence demonstrated better blood pressure control compared to those with low adherence.

Conclusion: The study revealed that a considerable proportion of hypertensive patients have suboptimal medication adherence. Clinical pharmacist interventions, including patient education and medication counseling, may significantly improve adherence and help achieve better blood pressure control.

Keywords: Medication adherence; Hypertension, Antihypertensive therapy,MMAS-8, Clinical pharmacy.

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APP ABSTRACT - APP 2026 - 079

PHARMACOLOGICAL SCREENING OF ANALGESIC AND ANTI-IFLAMMATORY ACTIVITY OF SIDA ACUTA BURM

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Abstract
Pain and inflammation are the major health problems commonly treated with traditional remedies mainly using medicinal plants. *Sida acuta Burm* is one of such medicinal plants used in folkloric medicine of India. However, the plant has not been scientifically evaluated. The aim of this study was to evaluate analgesic and anti-inflammatory effects of the 80% methanol leaves extract of *Sida acuta Burm* using rodent models.
The central and peripheral analgesic effect of the extract at 100, 200, and 400 mg/kg dose levels was evaluated using hot plate and acetic acid induced writhing rodent models, whereas carrageenan induced paw edema and cotton pellet granuloma methods were used to screen anti-inflammatory effect of the extract at the same dose levels. Acute toxicity test was also done. Data were analyzed using one-way ANOVA followed by Tukey's post hoc test and $p < 0.05$ was considered significant.
The extract did not produce mortality up to 2000 mg/kg. All tested doses of the extract showed significant analgesic effect with maximum latency response of 62.8% and inhibition of acetic acid induced writhing. Maximum anti-inflammatory effect was recorded at 6 h after induction, with 75.88% reduction in carrageenan induced paw edema. Moreover, all tested doses of extract significantly inhibited the formation of inflammatory exudates and granuloma formation ($p < 0.001$).
Conclusion. The study indicated that the extract was safe in mice and it has both analgesic and anti-inflammatory effect in rodent models.
Keywords: *Sida acuta Burm,* Ethnomedicinal, Phytochemical, Analgesic and Anti-inflammatory activity.

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APP ABSTRACT - APP 2026 - 080

DEGRADATION STUDY OF DOXYCYCLINE IN BULK AND FORMULATION BY UV-VISIBLE SPECTROPHOTOMETRY

Sidhan Bin Aboobacker

ELIMS College Of Pharmacy

Abstract:

Introduction: Forced degradation is a process that involves degradation of drug products and drug substances at condition more severe than accelerated conditions and thus generates degradation products that can be studied to determine the stability of the molecule.

To investigate the forced degradation study for the determination of degradation of Doxycycline by UV-Visible spectrophotometric method. Doxycycline sample and standard were exposed to different stress conditions (hydrolytic and oxidative degradation). Both standard drug and marketed formulations were used for the degradation study. The amount of percentage degradation of each standard and samples were calculated by taking absorbance at their λmax with the help of UV-Visible spectrophotometer. Forced degradation of drug substance was done by exposing to acidic, basic and to medium of hydrogen peroxide. The degradation results of each condition were compared with that of standard. This method can be used successfully for studying the stress degradation factors. Because this method is less time consuming and simple and cost effective also. Forced degradation of selected drugs performed using HCl, NaOH and H2O2. Degraded sample were quantified by UV visible spectroscopy. In all the methods used in degradation study, sample undergoes greater degradation compared with that of standard. Among the degradation conditions used in the study it is found that NaOH produce more degradation.

Keywords: Doxycycline; Forced degradation study; UV-Visible spectrophotometry; Percentage degradation;

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APP ABSTRACT - APP 2026 - 081

NANOTECHNOLOGY APPROACHES TO CROSSING THE BBB AND DRUG DELIVERY TO THE CNS

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Abstract:

Nanotechnology as emerged as a promising approach in overcoming the limitations of conventional drug delivery to the central nervous system (CNS). The presence of the Blood–Brain Barrier restricts the entry of most therapeutic agents into the brain, posing a significant challenge in the treatment of neurological disorders and brain tumors. This study highlights the role of nanotechnology-based delivery systems in enhancing drug transport across the BBB.

Various nanocarriers, including polymeric nanoparticles, liposomes, solid lipid nanoparticles, and nanogels, have been explored for their ability to encapsulate drugs and protect them from degradation. Surface-modified nanoparticles, such as polysorbate-80 coated systems, facilitate receptor-mediated endocytosis, enabling efficient brain targeting. These nanodevices not only improve drug bioavailability but also allow controlled and sustained release at the target site.

Additionally, nanotechnology plays a crucial role in the delivery of macromolecules such as peptides and oligonucleotides, which otherwise cannot cross the BBB. Studies have demonstrated significantly enhanced drug accumulation in brain tissues and improved therapeutic outcomes, particularly in conditions such as brain tumors and neurodegenerative diseases.

In conclusion, nanotechnology-based drug delivery systems represent a transformative strategy for CNS therapeutics by enabling targeted, efficient, and minimally invasive treatment. Despite existing challenges related to safety and scalability, ongoing research continues to advance their clinical potential.

Key words: Drug delivery system, BBB , Polymeric nanocarriers, CNS, Obligonucleotides, Nanogels, Liposomes.

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APP ABSTRACT - APP 2026 - 082

DIGITAL TWIN–BASED AI SIMULATION FOR PERSONALIZED DRUG SAFETY MONITORING IN TELEMEDICINE

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Abstract:

The rapid growth of telemedicine has revolutionized healthcare delivery; however, real-time drug safety monitoring in remote settings remains a major challenge. Adverse Drug Reactions (ADRs), medication errors, and limited direct patient assessment can compromise therapeutic outcomes. Digital Twin technology integrated with Artificial Intelligence (AI) provides an innovative solution for personalized drug safety surveillance within telehealth systems.

A Digital Twin represents a dynamic virtual model of a patient created using real-time clinical data, laboratory values, physiological parameters, medication history, and genomic information. Through machine learning and predictive analytics, the system can simulate individual drug responses, predict potential adverse effects, optimize dosage regimens, and detect drug–drug interactions before clinical manifestation. This predictive model shifts pharmacovigilance from a reactive reporting approach to a proactive and preventive framework.

In telemedicine, Digital Twin–based AI platforms can continuously monitor patient data, generate automated safety alerts, and support clinical decision-making. This approach is particularly beneficial for elderly patients, polypharmacy cases, and individuals with chronic diseases requiring long-term therapy. Additionally, it enhances medication adherence, reduces preventable hospitalizations due to ADRs, and supports regulatory compliance through structured digital documentation.

Although challenges such as data privacy, interoperability, algorithm validation, and infrastructure integration exist, Digital Twin–based AI simulation represents a transformative advancement toward precision medicine and intelligent pharmacovigilance. This technology has the potential to redefine personalized drug safety monitoring in modern telehealth ecosystems.

Keywords: Digital Twin, Artificial Intelligence, Pharmacovigilance, Telemedicine, Personalized Medicine

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APP ABSTRACT - APP 2026 - 083

EXOSOME-BASED DRUG DELIVERY SYSTEMS: A NEXT-GENERATION STRATEGY FOR TARGETED THERAPEUTICS

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Abstract:
Targeted drug delivery remains a major challenge in modern therapeutics due to issues such as poor drug bioavailability, systemic toxicity, and lack of tissue specificity. Recently, exosomes have emerged as promising natural nanocarriers for efficient drug delivery. Exosomes are nano-sized extracellular vesicles (30–150 nm) secreted by various cell types and play a crucial role in intercellular communication by transporting proteins, lipids, and nucleic acids. Their unique biological properties, including high biocompatibility, low immunogenicity, and
intrinsic targeting ability, make them attractive candidates for advanced drug delivery systems. Exosome-based delivery platforms have demonstrated significant potential in improving the therapeutic efficacy of drugs, particularly in the treatment of complex diseases such as cancer, Alzheimer's disease, and Parkinson's disease. These vesicles can be engineered to encapsulate a wide range of therapeutic agents, including small molecule drugs, RNA therapeutics, and proteins. Additionally, their ability to cross biological barriers, such as the blood–brain barrier, offers a unique advantage for treating neurological disorders.
Recent advances in biotechnology have enabled the development of modified or engineered exosomes with improved targeting efficiency and drug loading capacity. Despite promising results, challenges such as large-scale production, purification, and standardization remain critical for clinical translation. Overall, exosome-based drug delivery represents a cutting-edge approach with the potential to revolutionize precision medicine and future therapeutic strategies.

Keywords: Exosomes; Targeted Drug Delivery; Nanomedicine; Precision Medicine.

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APP ABSTRACT - APP 2026 - 084

EXOSOMES AS INNOVATIVE NANOCARRIERS FOR TARGETED AND PERSONALIZED DRUG DELIVERY

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Abstract

To evaluate the potential of exosomes as next-generation drug delivery systems, focusing on their biological characteristics, targeting efficiency, and therapeutic applications in improving drug delivery outcomes. A comprehensive review of recent literature was conducted to analyze the structure, biogenesis, and functional properties of exosomes. Various drug loading techniques, including passive incubation, electroporation, and surface engineering, were assessed along with their efficiency in delivering therapeutic agents. Comparative analysis with conventional nanocarriers was also performed to highlight advantages.

Exosomes, nanosized extracellular vesicles (30–150 nm), demonstrated superior biocompatibility, low immunogenicity, and enhanced stability in systemic circulation. Their inherent ability to cross biological barriers, such as the blood-brain barrier, and deliver drugs with high specificity resulted in improved therapeutic efficacy and reduced adverse effects. Studies indicated successful application of exosomes in cancer therapy, gene delivery, and neurological disorders, with better targeting efficiency compared to synthetic delivery systems.

Exosomes represent a promising and innovative platform for targeted and personalized drug delivery. Their natural origin and unique biological properties offer significant advantages over conventional systems. However, challenges such as large-scale production, purification, and regulatory standardization must be addressed to enable widespread clinical application.

Keywords: Exosomes, Drug Delivery Systems, Nanocarriers, Targeted Therapy, Personalized Medicine

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APP ABSTRACT - APP 2026 - 085

BIOACTIVES AND METAL NANOPARTICLE HYBRID NANOSTRUCTURES: A NOVEL APPROACH TO FIGHTING ANTIMICROBIAL RESISTANCE

S. Jaiganesh* D. Akiladevi

Abstract

The emergence of multidrug-resistant (MDR) pathogens has necessitated the development of innovative antimicrobial strategies beyond conventional antibiotics. In this context, the synthesis of bioactive compound-capped metal nanoparticles (MNPs) has gained significant attention as a rational and effective approach to enhance antimicrobial efficacy. Bioactive molecules, including phytochemicals, peptides, and antibiotics, possess inherent biological activities, while metal nanoparticles such as silver, zinc oxide, and copper exhibit unique physicochemical properties, including high surface reactivity, reactive oxygen species (ROS) generation, and enhanced membrane permeability. The integration of bioactive compounds with MNPs results in hybrid nanostructures that demonstrate synergistic mechanisms of action. These include improved cellular uptake, targeted disruption of microbial membranes, increased oxidative stress, and interference with essential metabolic and genetic processes. Surface functionalization of MNPs further enhances their stability, biocompatibility, and controlled drug release, thereby enabling reduced effective dosages and minimizing potential toxicity. Recent studies highlight that these hybrid nanomedicines exhibit superior antimicrobial performance compared to their individual components. They show broad-spectrum activity against Gram-positive and Gram-negative bacteria, as well as effectiveness against biofilms and drug-resistant strains. Such multifunctional systems also offer advantages in overcoming resistance mechanisms due to their multitarget mode of action. Bioactive compounds emphasise their role as a promising multitarget antimicrobial strategy with significant potential in therapeutic, biomedical, and environmental applications, paving the way for next-generation antimicrobial interventions.

Keywords: multidrug,gram positive,gram negative,nanoparticles

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APP ABSTRACT - APP 2026 - 086

NANOTECHNOLOGY-BASED DRUG DELIVERY SYSTEMS FOR IMPROVING SOLUBILITY AND BIOAVAILABILITY OF POORLY SOLUBLE DRUGS

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Abstract:

Nanotechnology has been recognized as a promising tool to address the issues of solubility and bioavailability of poorly soluble drugs, especially BCS Class II and Class IV drugs. Poor aqueous solubility can act as a barrier to the absorption of the drug, thus affecting its therapeutic efficacy. In the present study, different nanoscale drug delivery systems (NDDS) have been explored to overcome the problems associated with poorly soluble drugs. These include lipid-based nanocarriers, polymeric nanoparticles, Nano emulsions, nanogels, and inorganic nanocarriers. These nanoscale drug delivery systems have been shown to improve the solubility, stability, and absorption of the drug, thus improving therapeutic efficacy while reducing adverse effects. Emphasis was given to the role of nanoparticle size, surface modification, and their importance in improving the efficiency of drug delivery. Optimizing all the parameters can help in achieving targeted drug delivery, thus improving therapeutic efficacy. Recent advancements in nanotechnology have greatly contributed to the development of efficient drug delivery systems for poorly soluble drugs. Certain limitations, including high production costs and potential hazards, also need to be taken into consideration. Nanotechnology can thus be regarded as a promising and innovative tool in pharmaceutical engineering, providing new avenues in drug delivery systems.

Keywords: Nanotechnology; NDDS; Poorly soluble drugs; Bioavailability; Solubility; Targeted drug delivery; Nanocarriers; Pharmaceutical engineering.

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APP ABSTRACT - APP 2026 - 087

INFLUENZA VIRUS: EVOLUTION, PANDEMICS, AND MODERN THERAPEUTIC STRATEGIES

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Abstract:

Influenza is a highly contagious viral respiratory disease caused mainly by influenza A and B viruses, which undergo frequent antigenic changes leading to seasonal epidemics and occasional pandemics. It spreads through respiratory droplets and presents with symptoms such as fever, cough, myalgia and respiratory complications, particularly in high-risk groups like children and the elderly. Vaccination remains the most effective prevention measure, while antiviral drugs such as Neuraminidase inhibitors are used for treatment and prophylaxis. However, high mutation rates and antiviral resistance continue to challenge control efforts. Recent advances in Neuraminidase-based vaccine strategies offer promising prospects for broader and longer-lasting protection against diverse influenza strains.

Key Words: Influenza, Hemagglutinin, Neuraminidase, Oseltamivir, Zanamivir, Trivalent Inactivated Vaccines (TIV), Morbidity, Mortality, Surveillance, Pandemics.

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APP ABSTRACT - APP 2026 - 088

ACUTE KIDNEY INJURY SECONDARY TO NEPHROTOXIC DRUGS: A CLINICAL OVERVIEW

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Abstract

Acute Kidney Injury (AKI) is a sudden decline in renal function characterized by an increase in serum creatinine and/or reduction in urine output. Drug-induced AKI is a significant and preventable cause of morbidity and mortality, especially among hospitalized patients. A wide range of medications—including nonsteroidal anti-inflammatory drugs (NSAIDs), antibiotics such as aminoglycosides, radiographic contrast agents, diuretics, and certain chemotherapeutic drugs—are known to impair renal function through various mechanisms.

The pathophysiology of drug-induced AKI primarily involves hemodynamic alterations, direct tubular toxicity, interstitial nephritis, and crystal-induced obstruction. Risk factors include advanced age, pre-existing renal impairment, dehydration, polypharmacy, and comorbid conditions such as diabetes and hypertension. Clinical presentation may range from asymptomatic biochemical changes to severe complications like oliguria, electrolyte imbalance, and uremia.

Early identification through monitoring of renal parameters, along with prompt discontinuation or dose adjustment of the offending drug, is crucial in preventing progression. Management strategies focus on supportive care, optimization of fluid balance, and in severe cases, renal replacement therapy. Preventive measures such as appropriate drug selection, dose modification based on renal function, and therapeutic drug monitoring play a vital role.

In conclusion, drug-induced AKI remains a critical clinical concern, emphasizing the importance of rational drug use and vigilant monitoring to minimize renal complications and improve patient outcomes.

Key words: Acute Kidney Injury, Oliguria, uremia, Aminoglycosides

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APP ABSTRACT - APP 2026 - 089

LIPOSOMAL AND NANOPARTICLE DRUG DELIVERY SYSTEMS FOR IMPROVING ANTIBIOTIC BIOAVAILABILITY IN RESISTANT BACTERIAL INFECTIONS

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ABSTRACT:

Antimicrobial resistance (AMR) has become a major global healthcare challenge, significantly reducing the effectiveness of conventional antibiotic therapies. Resistant pathogens such as Staphylococcus aureus (including methicillin-resistant strains), Escherichia coli, Klebsiella pneumoniae, and Acinetobacter baumannii are increasingly difficult to treat due to mechanisms like enzymatic drug degradation, efflux pumps, and biofilm formation. A key factor contributing to therapeutic failure is the poor bioavailability and limited tissue penetration of many antibiotics.Recent advances in nanotechnology have introduced innovative drug delivery systems, particularly liposomes and nanoparticles, as promising strategies to overcome these limitations. Liposomes are phospholipid-based vesicles capable of encapsulating both hydrophilic and lipophilic drugs, thereby protecting antibiotics from degradation and enhancing targeted delivery to infection sites. Similarly, polymeric and lipid-based nanoparticles provide controlled and sustained drug release, improve drug stability, and enhance permeability across biological membranes.Encapsulation of antibiotics such as ciprofloxacin, amikacin, and vancomycin into these nanocarriers has demonstrated enhanced antibacterial activity against resistant strains, including methicillin-resistant Staphylococcus aureus. These systems improve drug accumulation at infection sites, facilitate targeted therapy, and increase overall therapeutic efficacy. Additionally, they have shown the ability to disrupt bacterial biofilms and reduce systemic toxicity compared to conventional formulations.Overall, nanotechnology-based antibiotic delivery systems represent a promising approach to combat antimicrobial resistance by enhancing drug bioavailability, improving antibacterial action, and achieving better clinical outcomes.

Keywords: Antimicrobial resistance, Nanotechnology, Liposomes, Nanoparticles, Bioavailability, Targeted drug delivery, Antibiotic resistance, Biofilms, Controlled release, Drug delivery systems.

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APP ABSTRACT - APP 2026 - 090

NETWORK PHARMACOLOGY–DRIVEN IN SILICO INVESTIGATION OF FLAVONOIDS AS MULTI-TARGET PHYTOCONSTITUENTS FOR ALZHEIMER'S DISEASE

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Abstract:

To investigate the multi-target therapeutic potential and underlying molecular mechanisms of flavonoids in Alzheimer's disease using a network pharmacology–driven in silico approach. Selected flavonoids were screened based on pharmacokinetic parameters and drug-likeness properties. Putative targets of flavonoids were retrieved from publicly available databases and intersected with AD-associated genes to identify common targets. A protein–protein interaction (PPI) network was constructed to determine key hub genes. Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway enrichment analyses were performed to elucidate relevant biological processes and signaling pathways. Molecular docking studies were conducted to validate the binding interactions between selected flavonoids and core AD-related proteins. The integrative network pharmacology and molecular docking analysis suggests that flavonoids possess significant multi-target therapeutic potential against Alzheimer's disease. These findings provide a computational foundation for further experimental validation and development of flavonoid-based interventions for AD management.

Keywords: Alzheimer's disease; Flavonoids; Network pharmacology; Molecular docking; Multi-target therapy; Phytoconstituents; In silico analysis; Neuroprotection

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APP ABSTRACT - APP 2026 - 091

DATOPOTAMAB DERUXTECAN: A TARGETED THERAPY FOR CANCER USING ANTIBODY–DRUG CONJUGATES"

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Abstract:

Cancer treatment has advanced significantly with the development of targeted therapies. One such innovation is Datopotamab Deruxtecan (Dato-DXd), a novel antibody–drug conjugate (ADC) designed to treat cancers that express the TROP2 protein. TROP2 is commonly found in various epithelial tumors and is associated with poor prognosis, making it an important target for therapy.

Dato-DXd works by combining a monoclonal antibody that specifically binds to TROP2 with a potent anticancer drug (a topoisomerase I inhibitor). Once the drug binds to cancer cells, it is internalized and releases its cytotoxic payload inside the cell. This leads to DNA damage and eventually causes cancer cell death (apoptosis). Additionally, the released drug can affect nearby tumor cells, enhancing its therapeutic effect.

Preclinical studies have shown that Dato-DXd has strong antitumor activity in different cancer models, especially in tumors with high TROP2 expression such as lung and breast cancers. It demonstrated significant tumor regression with minimal effects on normal cells. Safety studies in animal models indicated acceptable toxicity profiles, although some side effects like mild tissue damage were observed at higher doses.

Overall, Datopotamab Deruxtecan represents a promising targeted therapy with improved drug delivery and reduced systemic toxicity. It offers potential benefits over conventional chemotherapy and could become an effective treatment option for patients with TROP2-expressing cancers.

Keywords: Antibody-drug conjugate, TROP2, Targeted cancer therapy, Apoptosis, Xenograft models, Antitumor activity.

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APP ABSTRACT - APP 2026 - 092

REWRITING AUTISM AT THE GENETIC LEVEL : EMERGING GENE THERAPY STRATEGIES TRANSFORMING AUTISM SPECTRUM DISORDER TREATMENT – A COLLECTIVE REVIEW

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Abstract:

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition marked by repetitive behaviors and social communication challenges. While traditional treatments like behavioral therapy and antipsychotics manage symptoms such as irritability and hyperactivity, they do not address the underlying biological causes. Recent genomic research has identified mutations in genes responsible for synaptic development and neuronal signaling—such as SHANK3, MECP2, FMR1, and CNTNAP2—as primary drivers of the disorder. The review examines the application of three innovative molecular pillars designed to target these genetic roots: Viral Vector-Mediated Gene Delivery: Utilizing engineered adeno-associated viruses (AAVs), specifically serotypes like AAV9, to deliver functional "replacement" copies of genes across the blood-brain barrier.CRISPR-Cas9 Genome Editing: Acting as "molecular scissors," this complex uses a guide RNA to physically cut and permanently repair DNA mutations or reactivate silenced genes.Antisense Oligonucleotides (ASOs): Functioning as a "genetic dimmer switch," these synthetic strands target mRNA to silence faulty genes or modify protein splicing without permanently changing the host genome.Improved synaptic communication between neurons.

Restoration of neuronal network function. A measurable reduction in autism-like behavioral abnormalities. The potential for long-lasting, disease-modifying outcomes rather than lifelong symptom management.

Gene therapy represents a paradigm shift toward precision medicine for ASD. While the potential for reversing core deficits is high, significant hurdles remain, including ensuring the safety of brain-wide delivery and minimizing off-target genetic effects. Future progress depends on advancing early genetic diagnosis and conducting rigorous clinical trials to transition these "molecular tools" into standard clinical practice.

Keywords: Autism Spectrum Disorder, Genome Editing, Antisense Oligonucleotide Therapies, Viral Vector-Mediated Delivery

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APP ABSTRACT - APP 2026 - 093

NANOTECHNOLOGY IN DRUG DELIVERY: REVOLUTIONIZING THERAPEUTIC OUTCOMES THROUGH TARGETED AND CONTROLLED RELEASE SYSTEMS

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Abstract

Conventional drug delivery systems often face limitations such as poor bioavailability, lack of target specificity,rapid degradation, and increased risk of systemic side effects. These challenges can reduce therapeutic efficacy and negatively impact patient outcomes, particularly in chronic and complex diseases. Nanotechnology has emerged as an innovative approach to overcome these barriers by enabling targeted and controlled drug delivery.

Nanotechnology-based drug delivery systems utilize nanoscale carriers, typically ranging from 1 to 100 nanometres, to deliver drugs more effectively to specific sites of action. Various nanocarriers, including liposomes, polymeric nanoparticles, dendrimers, and solid lipid nanoparticles, are designed to enhance drug solubility, stability, and bioavailability. Surface modification techniques, such as ligand attachment, allow these carriers to selectively target diseased tissues, thereby minimizing off-target effects and reducing toxicity.

A key advantage of nanotechnology is its ability to improve pharmacokinetic and pharmacodynamic profiles of drugs. In cancer therapy, nanocarriers enable targeted delivery of chemotherapeutic agents, increasing drug concentration at tumour sites while sparing healthy tissues. Additionally, nanotechnology facilitates drug delivery across biological barriers, such as the blood–brain barrier, expanding treatment options for central nervous system disorders. Applications also extend to infectious diseases and gene therapy.

Despite its potential, challenges such as high production costs, scalability issues, and safety concerns remain. Nevertheless, nanotechnology holds significant promise in enhancing therapeutic outcomes and advancing modern pharmacotherapy.

Keywords: Nanotechnology, nanometres, Nanotechnology-based drug delivery systems, tumour sites, nanocarriers, pharmacokinetic and pharmacodynamic

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APP ABSTRACT - APP 2026 - 094

NETWORK-BASED DOCKING AND ADMET STUDIES OF FLAVONOIDS AGAINST ALZHEIMER'S DISEASE

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Abstract

Alzheimer's disease is a progressive neurodegenerative disorder that primarily affects the elderly population, leading to a gradual decline in memory, cognitive function, and the ability to perform daily activities. This condition is characterised by the accumulation of beta-amyloid plaques and neurofibrillary tangles in the brain, resulting in neuronal loss and brain atrophy. It is the most common form of dementia. Currently, there is no definitive cure for Alzheimer's, and existing treatments only offer symptomatic relief, underscoring the urgent need for more effective therapeutic strategies. This research focuses on the neuroprotective effects of flavonoids in Alzheimer's disease, including antioxidant and anti-inflammatory and amyloid fibril regulation mechanisms. This study is aimed at assessing recent data on flavonoid-based therapeutic strategies, their role in the molecular targets for Alzheimer's disease as well as three natural compounds: Hesperidin, EGCG and Curcumin on cognitive enhancement, their potential clinical relevance in the management of Alzheimer's. A systematic analysis of pharmacokinetic, pharmacodynamic and drug-likeness properties of three different bioactive phytochemicals in correlation with their potential therapeutic activity against Alzheimer's disease was performed. Particular emphasis was on evaluating their physicochemical properties, ADME characteristics, molecular interactions with target protein 7E3H, and potential as lead drug candidates.

***Keywords**:* ADMET, Alzheimer's disease, Curcumin, EGCG, Flavonoids, Hesperidin.

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APP ABSTRACT - APP 2026 - 095

LASSA FEVER ANTIVIRAL DEVELOPMENT

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Abstract:

The Lassa virus causes Lassa fever, a severe viral hemorrhagic sickness that is mainly spread to humans via contact with infected Mastomys rat fluids. It is endemic in a number of West African nations and contributes significantly to annual morbidity and mortality. There are now few therapeutic options available, and the most widely used therapy is the antiviral medication ribavirin, albeit its efficacy depends on early delivery and it may have side effects.

Finding new substances that prevent viral entrance, replication, or protein synthesis is the main goal of current antiviral development initiatives. RNA polymerase inhibitors, monoclonal antibodies, and small-molecule antivirals that target viral glycoproteins are promising approaches. Potential treatment candidates have been found more quickly thanks to developments in molecular virology and drug discovery tools. To enhance treatment results, combined antiviral treatments and vaccination studies are also being investigated. Despite these developments, problems with virus mutation, clinical trial implementation, and therapeutic accessibility still exist. To lower mortality and manage Lassa fever outbreaks in endemic areas, more research into antiviral drugs and better treatment approaches is crucial.

Keywords: Ribavirin, Antiviral drug development, RNA polymerase inhibitors, Monoclonal antibodies, Viral glycoprotein inhibitors,Viral replication inhibition

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APP ABSTRACT - APP 2026 - 096

AN EVALUATION OF ANTIBIOTIC PRESCRIPTION PATTERN AND DRUG RATIONALITY ANALYSIS AMONG OUTPATIENTS AT PUBLIC HEALTH SETTING, INDIA

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Abstract:

Antimicrobial resistance (AMR) poses a top global health threat, driven largely by inappropriate antibiotic prescribing. The WHO's Global Action Plan emphasizes prudent antibiotic use to curb AMR, yet up to 50% of prescriptions worldwide remain irrational, especially in outpatient settings of developing countries like India. Factors such as overprescription without diagnostics exacerbate the issue. Purpose of this study evaluated antibiotic prescribing patterns and rationality in a public community health facility serving 12,900 urban-rural populations in North India, aiming to identify gaps and inform stewardship interventions. A cross-sectional audit of 1,219 outpatient antibiotic prescriptions occurred from August 2021 to August 2022. Experts (ID specialists, clinical pharmacologists) assessed drug type, dose, duration, adherence to NCDC/PGIMER guidelines, WHO AWaRe classification, diagnoses, and essential drug list compliance using standard protocols. Prescriptions skewed female (54%) and aged 20-40 years. Amoxicillin-clavulanic acid (27.2%), metronidazole (13.4%), and azithromycin (10.3%) dominated. AWaRe breakdown: 49.7% Access, 27.3% Watch, 0% Reserve. Diarrhea and respiratory infections emerged as key areas for reducing overuse. Findings highlight suboptimal prescribing, particularly for self-limiting infections, underscoring needs for prescriber training, audit oversight, and evidence-based guidelines to boost Access antibiotic use toward WHO targets and combat AMR.

Keywords: Antibiotic prescribing patterns, Antimicrobial resistance (AMR), Drug rationality, AWaRe classification, Amoxicillin-clavulanic acid, Antimicrobial stewardship, Prescription audit, Drug use evaluation, Community health facilityein inhibitors, Viral replication inhibition

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APP ABSTRACT - APP 2026 - 097

NANO-ANTIBIOTICS: HARNESSING SILVER NANOPARTICLES TO DEFEAT SUPERBUGS

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Abstract :

The rapid emergence of antimicrobial resistance (AMR) among pathogenic microorganisms has necessitated the exploration of alternative therapeutic strategies. This study focuses on the application of silver nanoparticles (AgNPs) as a novel antimicrobial agent against multidrug-resistant (MDR) bacteria. AgNPs were synthesized using a chemical reduction method and characterized based on size, morphology, and stability. Their antimicrobial efficacy was evaluated against common resistant strains such as Staphylococcus aureus and Escherichia coli. The results demonstrated that AgNPs exhibit potent antimicrobial activity through multiple mechanisms, including disruption of bacterial cell membranes, generation of reactive oxygen species (ROS), and interference with intracellular components such as DNA and proteins. Additionally, AgNPs showed significant ability to inhibit biofilm formation, a major factor contributing to antibiotic resistance.

Compared to conventional antibiotics, AgNPs displayed enhanced efficacy at lower concentrations, indicating their potential to reduce dosage-related toxicity. Furthermore, their multi-targeted mode of action minimizes the likelihood of resistance development.

However, concerns regarding cytotoxicity and long-term safety remain, highlighting the need for further in vivo studies and clinical evaluation. In conclusion, silver nanoparticle-based antimicrobial therapy represents a promising and effective approach in combating AMR and could serve as a valuable alternative or adjunct to existing antibiotic treatments.

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APP ABSTRACT - APP 2026 - 098

DRUG DEVELOPMENT AND PRECLINICAL STUDIES

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Abstract

Drug development is a complex, multidisciplinary process focusing at discovering, evaluating, and delivering safe and effective therapeutic agents to the market. It begins with target identification and ensuring the safety, where biological molecules associated with disease pathways are identified. This is followed by lead compound discovery and optimization using advanced techniques. Preclinical studies are conducted in vitro and in vivo to assess pharmacokinetics, Pharmacodynamics, and toxicity, ensuring candidate drugs are suitable for human trials. Clinical development progresses through Phase I (safety and dosage), Phase II (efficacy and side effects),Phase III (large- scale validation). Regulatory bodies such as the U.S. Food and Drug Administration and the Central Drugs Standard Control Organization play a critical role in evaluating the safety, efficacy, and quality of new drugs prior to approval. Despite significant advancements, drug development faces challenges including high costs, long timelines, and high attrition rates. However, emerging innovations such as artificial intelligence, precision medicine, and biologics are transforming the landscape, improving efficiency and success rates. Overall, drug development remains essential for advancing healthcare and addressing unmet medical needs worldwide

Keywords: Drug development; Target identification; Lead optimization; Preclinical studies; Clinical trials; Pharmacokinetics

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APP ABSTRACT - APP 2026 - 099

NANOTECHNOLOGY: INNOVATIONS SHAPING MODERN PHARMACEUTICAL AND FORENSIC SCIENCES

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Abstract

Nanotechnology is transforming pharmaceutical, life, and forensic sciences by enabling precise control at the nanoscale. In pharmaceuticals, it improves drug delivery through targeted therapy, enhanced bioavailability, and controlled release, reducing side effects. Nanocarriers such as liposomes and polymeric nanoparticles allow drugs to reach specific cells, increasing treatment effectiveness. In diagnostics, nanosensors and imaging techniques support early disease detection and monitoring. In forensic science, nanotechnology enhances the detection of drugs, toxins, and biological evidence with greater sensitivity and accuracy. It also aids in toxicology studies and biomarker identification. Future advancements focus on safer nanomaterials, ethical considerations, and integration with digital technologies. Overall, nanotechnology strengthens healthcare outcomes and improves the reliability of forensic investigations.

Keywords: Nanotechnology, Drug Delivery, Nanoparticles, Forensic Science, Nanosensors

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APP ABSTRACT - APP 2026 - 100

NANOTECHNOLOGY-BASED APPROACHES FOR ENHANCING DRUG BIOAVAILABILITY IN MODERN PHARMACY PRACTICE

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Abstract

Nanotechnology has emerged as a promising approach for improving the bioavailability and therapeutic efficiency of many pharmaceutical drugs. Many conventional drugs show poor solubility, limited absorption, and rapid metabolism, which reduce their clinical effectiveness. Nanotechnology-based drug delivery systems such as nanoparticles, liposomes, and nanoemulsions help overcome these challenges by improving drug solubility, stability, and targeted delivery. These systems also influence pharmacokinetic properties including absorption, distribution, metabolism, and elimination. Proper preformulation studies are essential to understand the physical and chemical characteristics of drug molecules before designing nano-based delivery systems. Advances in medicinal chemistry and drug design further support the development of safer and more efficient nanomedicines. In modern pharmacy practice, the integration of nanotechnology with novel drug delivery strategies offers improved patient outcomes and reduced side effects. Therefore, nanotechnology plays an important role in the future development of innovative pharmaceutical therapies.

Keywords: Nanotechnology, Bioavailability Enhancement, Drug Delivery Systems, Pharmacokinetics, Medicinal Chemistry

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DRUG DEVELOPMENT -FROMDISCOVERY TO MARKET

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Abstract

Drug development is a complex, multidisciplinary process aimed at discovering, designing, and delivering safe and effective therapeutic agents to treat diseases. It begins with the identification of a biological target associated with a disease, followed by the discovery and optimization of lead compounds through techniques such as high-throughput screening and computational modeling. Preclinical studies are then conducted using in vitro and in vivo models to evaluate the safety, efficacy, and pharmacokinetic properties of the drug candidate. Successful candidates proceed to clinical trials, which are carried out in multiple phases to assess safety, dosage, efficacy, and side effects in human subjects. Regulatory approval from authorities such as the Food and Drug Administration or Central Drugs Standard Control Organization is essential before commercialization. Post-marketing surveillance further ensures long-term safety and effectiveness. Despite advancements, drug development faces challenges such as high costs, long timelines, and a low success rate. Emerging technologies like artificial intelligence, personalized medicine, and biotechnology are transforming the field by improving efficiency and precision. This abstract highlights the key stages, challenges, and innovations in drug development, emphasizing its critical role in advancing modern healthcare.

Keywords: Drug Development, Biotechnology, Drug Delivery Systems, Pharmacokinetics, modern healthcare.

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APP ABSTRACT - APP 2026 - 102

NANOTECHNOLOGY

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Abstract

Nanotechnology is an advanced field of science and technology that deals with the manipulation and application of materials at the nanoscale level, typically ranging from 1 to 100 nanometers. At this scale, materials exhibit unique physical, chemical, and biological properties that are significantly different from their bulk counterparts. These unique properties make nanotechnology a powerful tool in various fields, including medicine, pharmacy, electronics, environmental science, and material engineering.In the field of pharmaceuticals, nanotechnology plays a vital role in improving drug delivery systems. Traditional drug delivery methods often face challenges such as poor solubility, low bioavailability, lack of target specificity, and adverse side effects. Nanotechnology-based drug delivery systems help to overcome these limitations by enhancing drug solubility, improving stability, and enabling targeted delivery to specific tissues or cells. Nanocarriers such as nanoparticles, liposomes, dendrimers, nanoemulsions, and polymeric micelles are widely used for this purpose. Nanotechnology also contributes significantly to the development of controlled and sustained drug release systems. These systems maintain a constant drug concentration in the body over an extended period, reducing the frequency of dosing and improving patient compliance. Furthermore,In conclusion, nanotechnology is a rapidly evolving field with immense potential to revolutionize various industries, particularly healthcare and pharmaceuticals. Its ability to improve drug delivery, enhance therapeutic efficacy, and enable targeted treatment makes it a promising approach for modern medicine. Continued research, innovation, and proper regulation will ensure the safe and effective utilization of nanotechnology for the benefit of society.

Keywords:

Nanotechnology; Nanoparticles; Drug delivery; Targeted therapy; Liposomes; Dendrimers; Nanoemulsion; Controlled release; Nanomedicine; Drug targeting.

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APP ABSTRACT - APP 2026 - 103

Role of Prodrug Design in Drug Development

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Abstract

Prodrug design is a strategic approach in drug development aimed at improving the pharmacokinetic and pharmacodynamic properties of active pharmaceutical ingredients. A prodrug is an inactive or less active derivative of a drug that undergoes enzymatic or chemical transformation in the body to release the active drug. This approach is widely used to enhance drug solubility, stability, bioavailability, and target specificity while reducing toxicity and side effects. Prodrugs can be designed for various purposes such as improving oral absorption, increasing drug permeability across biological membranes, and achieving site-specific drug delivery. Examples include ester prodrugs for better absorption and targeted prodrugs for cancer therapy. Despite its advantages, challenges include unpredictable metabolism and variability in activation among individuals. Overall, prodrug design plays a significant role in overcoming limitations of conventional drug molecules and improving therapeutic efficacy.

Keywords: Prodrug, Bioavailability, Drug Delivery, Pharmacokinetics, Drug Activation

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APP ABSTRACT - APP 2026 - 104

BIOAVAILABILITY ENHANCEMENT TECHNIQUES

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Abstract

Bioavailability enhancement is a crucial aspect in pharmaceutical research and drug development, as it determines the effectiveness of a drug in producing its therapeutic action. Bioavailability refers to the rate and extent to which a drug reaches the systemic circulation in an unchanged form. Many drugs, especially those administered orally, suffer from poor bioavailability due to factors such as low solubility, poor permeability, extensive first-pass metabolism, and instability in the gastrointestinal tract. These limitations can reduce the therapeutic efficacy of drugs and may lead to increased dosage requirements, resulting in side effects and poor patient compliance.

A significant number of newly developed drugs fall under poorly water-soluble categories, particularly those classified under Biopharmaceutics Classification System (BCS) Class II and Class IV. In such cases, dissolution becomes the rate-limiting step for drug absorption. Therefore, improving solubility and dissolution rate is essential for enhancing bioavailability. Various formulation and technological approaches have been developed to address these challenges and improve drug delivery. One of the widely used techniques for bioavailability enhancement is particle size reduction. By decreasing the particle size, the surface area of the drug increases, leading to faster dissolution and improved absorption. Techniques such as micronization and nanosuspension are commonly employed. Solid dispersion is another important approach, where the drug is dispersed in an inert carrier matrix in the solid state. This technique enhances the wettability, reduces crystallinity, and improves dissolution rate. Lipid-based drug delivery systems, surfactants, co-solvents, and cyclodextrin complexation further help in improving solubility and drug absorption. Recent advancements in nanotechnology such as nanoparticles, nanoemulsions, and polymeric micelles offer improved drug delivery, stability, and controlled release. In conclusion, bioavailability enhancement plays a vital role in improving drug performance and therapeutic outcomes. Continuous research and technological advancements are expected to provide more effective and safer solutions, ultimately improving patient compliance and quality of life.

Keywords: Bioavailability; Solubility enhancement; Drug absorption; Nanosuspension; Solid dispersion; Nanotechnology; Controlled release

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APP ABSTRACT - APP 2026 - 105

LIGAND-BASED DRUG DESIGN IN DRUG DISCOVERY

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Abstract

Ligand-Based Drug Design (LBDD) is an important strategy used when the three-dimensional structure of the biological target is not available. This approach relies on the knowledge of previously known active compounds (ligands) that interact with the target. By analyzing their structural and physicochemical properties, new drug candidates can be designed with improved activity and selectivity. Techniques such as Quantitative Structure–Activity Relationship (QSAR), pharmacophore modeling, and similarity searching are commonly used in LBDD. These methods help in identifying key functional groups responsible for biological activity and predicting the behavior of new compounds. LBDD is cost-effective and reduces experimental workload by narrowing down potential drug candidates before synthesis. However, its major limitation is the dependence on existing ligand data, which may restrict the discovery of entirely novel compounds. Despite this, LBDD remains a valuable tool in early-stage drug discovery and lead optimization.

Keywords: Ligand-Based Drug Design, QSAR, Pharmacophore Modeling, Similarity Search, Lead Optimization

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APP ABSTRACT - APP 2026 - 106

DRUG DESIGN AND DEVELOPMENT

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Abstract

Drug design has evolved from conventional target-based approaches into a multidisciplinary field integrating computational intelligence and complex biological systems. Traditional strategies often focus on a single molecular target; however, growing evidence indicates that therapeutic outcomes are influenced by interconnected pathways, hidden binding sites, and dynamic cellular environments. This study proposes an advanced framework for drug design by combining artificial intelligence–driven molecular modeling with system-level biological insights. Machine learning algorithms enable the identification of non-obvious ligand–target interactions, including allosteric binding sites that regulate protein function beyond active sites. Additionally, emerging concepts such as the dark proteome highlight the presence of structurally uncharacterized proteins that may serve as novel therapeutic targets. Furthermore, the role of the human microbiome in drug metabolism introduces a new dimension to pharmacological design, influencing both efficacy and toxicity. By incorporating microbiome-aware screening and adaptive molecular optimization, drug candidates can be tailored for enhanced precision and reduced adverse effects. This integrated approach shifts the paradigm from a reductionist “one drug–one target” model to a holistic, network-based strategy. Such innovations hold the potential to accelerate drug discovery, improve therapeutic success rates, and pave the way for personalized medicine in future healthcare systems.

Keywords: Drug design, Machine learning, one drug–one target, micro biome-aware screening, adaptive molecular optimization.

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APP ABSTRACT - APP 2026 - 107

HIGH-THROUGHPUT SCREENING IN DRUG DISCOVERY

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Abstract

High-Throughput Screening (HTS) is a powerful technique used in drug discovery to rapidly evaluate thousands to millions of compounds for biological activity against a specific target. This method integrates automation, robotics, data processing, and sensitive detection techniques to accelerate the identification of potential lead compounds. HTS enables the screening of large chemical libraries in a short period, significantly reducing the time required for drug discovery. It is widely used in identifying enzyme inhibitors, receptor ligands, and modulators of biological pathways. Advances in miniaturization and assay development have further enhanced the efficiency and accuracy of HTS. However, challenges such as false positives, high operational costs, and data management issues remain. Despite these limitations, HTS continues to be a cornerstone technology in modern drug discovery, facilitating the rapid identification of promising drug candidates.

Keywords: High-Throughput Screening, Automation, Drug Discovery, Lead Identification, Chemical Libraries

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APP ABSTRACT - APP 2026 - 108

ROLE OF PHARMACY PRACTICE IN IMPROVING PATIENT CARE AND MEDICATION SAFETY

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Abstract

Pharmacy practice plays a crucial role in ensuring the safe and effective use of medications in healthcare systems. Pharmacists are actively involved in patient counseling, medication therapy management, and monitoring drug interactions and adverse effects. The evolution of pharmacy practice from product-oriented to patient-centered care has significantly improved treatment outcomes. Proper medication review and patient education help in enhancing adherence and minimizing medication errors. In addition, pharmacists collaborate with healthcare professionals to optimize drug therapy and ensure rational drug use. Advances in clinical pharmacy and the integration of technology have further strengthened pharmacy services. Preformulation knowledge and pharmacokinetic understanding also support better drug selection and dosing. Overall, pharmacy practice contributes to improved patient safety, reduced healthcare costs, and enhanced quality of life, making it an essential component of modern healthcare systems.

Keywords: Pharmacy Practice, Patient Care, Medication Safety, Clinical Pharmacy, Drug Therapy

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THE EVOLVING ROLE OF CLINICAL PHARMACISTS IN PATIENT-CENTRED CARE AND MEDICATION MANAGEMENT

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Abstract

Pharmacy practice has transitioned from a product-oriented model to a patient-focused approach, positioning pharmacists as essential members of the multidisciplinary healthcare team. This study explores the evolving role of clinical pharmacists in enhancing patient safety and optimizing therapeutic outcomes through direct patient care, medication reconciliation, and tailored education. Evidence indicates that pharmacist-led interventions, particularly in managing chronic diseases like diabetes and cardiovascular disorders, lead to better medication adherence and reduced hospital readmissions. By identifying drug-related problems (DRPs) and offering personalized counseling, pharmacists improve patient safety, reduce medication errors, and ensure the rational use of medicine. Despite organizational barriers, the integration of pharmacists in outpatient and inpatient settings is crucial for high-quality care. This review highlights that empowering pharmacists as clinical practitioners, supported by interprofessional collaboration, is essential for improving clinical, economic, and humanistic patient outcomes.

Keywords: Transition from product to patient-centred care, Interventions (Medication management/reconciliation), Impact on outcomes (Adherence/safety)., Future/Conclusion (Interprofessional collaboration).

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APP ABSTRACT - APP 2026 - 110

PHARMACOKINETICS OF DRUG DELIVERY SYSTEMS”

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Abstract

Pharmacokinetics plays a crucial role in the design and evaluation of drug delivery systems by describing how a drug is absorbed, distributed, metabolized, and eliminated in the body. Advanced drug delivery systems are developed to optimize these pharmacokinetic processes, ensuring improved therapeutic efficacy and reduced toxicity. These systems, including controlled-release, targeted delivery, and nanocarrier-based formulations, aim to maintain drug concentration within the therapeutic window for an extended period. By modifying factors such as drug solubility, stability, and permeability, they enhance bioavailability and minimize frequent dosing. Controlled drug delivery systems regulate the rate and duration of drug release, leading to steady plasma concentrations and better patient compliance. Targeted drug delivery systems, on the other hand, direct the drug specifically to the site of action, reducing systemic side effects and improving treatment outcomes. Pharmacokinetic parameters such as half-life, clearance, and volume of distribution are significantly influenced by the type of delivery system used. Overall, the integration of pharmacokinetic principles with innovative drug delivery technologies has revolutionized modern therapeutics. It enables precise control over drug action, improves safety profiles, and supports the development of personalized medicine for more effective disease management.

Keywords: Pharmacokinetics, Drug Delivery Systems, Controlled Release, Targeted Delivery, Nanocarriers, Bioavailability

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APP ABSTRACT - APP 2026 - 111

Medicinal Chemistry and Drug Discovery

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Abstract

Medicinal chemistry is a multidisciplinary field that combines principles of chemistry, pharmacology, biology, and pharmaceutical sciences to design, develop, and optimize drugs for the treatment and prevention of diseases. It plays a crucial role in modern healthcare by enabling the discovery of new therapeutic agents and improving the safety and efficacy of existing medications. Medicinal chemistry focuses on the relationship between the chemical structure of a compound and its biological activity. Scientists in this field study how drugs interact with biological targets such as enzymes, receptors, and nucleic acids. Through structure-activity relationship (SAR) studies, medicinal chemists modify chemical structures to enhance potency, selectivity, and pharmacokinetic properties. Drug discovery generally begins with the identification of a biological target involved in a disease process. After identifying the target, researchers design or screen chemical compounds that can interact with it. Promising molecules are then optimized through chemical modification to improve their therapeutic effect while reducing toxicity. Another important aspect of medicinal chemistry is drug metabolism and pharmacokinetics, which determine how a drug is absorbed, distributed, metabolized, and excreted in the body. Understanding these processes helps scientists design drugs that are more effective and have fewer side effects. Medicinal chemistry also contributes to the development of various classes of drugs including antibiotics, antivirals, anticancer agents, analgesics, and cardiovascular drugs. Advances in technology such as computer aided drug design, molecular modeling, and biotechnology have greatly accelerated the process of drug discovery. In recent years, medicinal chemistry has played a significant role in addressing global health challenges by developing new treatments for infectious diseases, cancer, and chronic disorders. The field continues to evolve with the integration of artificial intelligence, genomics, and precision medicine, which allow scientists to design more targeted and personalized therapies. In conclusion, medicinal chemistry is fundamental to the discovery and development of modern medicines, and continuous research in this field will lead to safer, more efficient, and more targeted treatments for various diseases in the future.

Keywords: Medicinal chemistry involves integration of disciplines, SAR studies, identification of targets, understanding, pharmacokinetics, diverse applications, technological advancements, and future prospects.

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APP ABSTRACT - APP 2026 - 112

BIOAVAILABILITY ENHANCEMENT

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Abstract

Improving the bioavailability of poorly absorbed drugs is crucial for enhancing therapeutic efficacy. Bioavailability enhancement strategies aim to increase the rate and extent of drug absorption, thus optimizing drug effectiveness. These strategies include the use of lipid-based delivery systems, nanoparticles, solid dispersions, inclusion complexes, and permeation enhancers. By improving solubility, stability, and gastrointestinal permeability, these techniques ensure that more of the drug reaches systemic circulation. Enhanced bioavailability can lead to reduced dosages, fewer side effects, and improved patient compliance. By utilizing innovative drug delivery systems and modifying pharmacokinetic properties, researchers can overcome the limitations of conventional formulations. This leads to better drug performance and more effective treatments, ultimately enhancing patient outcomes and minimizing therapeutic failure.

Keywords: Bioavailability, Enhancement, Effectiveness, Nanoparticles, Techniques, Modification

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APP ABSTRACT - APP 2026 - 113

NANOTECHNOLOGY

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Abstract

In the field of medicine, nanotechnology plays a crucial role in improving diagnosis, treatment, and prevention of diseases. It enables targeted drug delivery systems, where drugs are delivered directly to specific cells or tissues, thereby increasing therapeutic effectiveness and reducing side effects. Nanoparticles, liposomes, and other nanocarriers are widely used to enhance drug solubility, stability, and bioavailability. Nanotechnology also supports advanced diagnostic techniques such as nanosensors and imaging tools, which help in early detection of diseases like cancer. Additionally, it contributes to regenerative medicine, including tissue engineering and wound healing applications. In electronics, nanotechnology has revolutionized the development of smaller, faster, and more energy-efficient devices. Nanoscale transistors and circuits have enabled the production of high-performance electronic devices such as smartphones, computers, and wearable technologies. In the energy sector, nanotechnology enhances the efficiency of renewable energy systems, including solar cells, fuel cells, and batteries, contributing to sustainable energy solutions. Environmental applications of nanotechnology include water purification, air pollution control, and waste management. Nanomaterials are used to remove harmful contaminants, heavy metals, and microorganisms from water, ensuring safe drinking water. They also help in breaking down pollutants in air and soil, promoting environmental sustainability. Despite its numerous advantages, nanotechnology raises concerns related to toxicity, environmental impact and their long-term errects oncan health and ecosy isms must ibe carefuly studiaricles Therefore, proper regulations and safety measures are essential for the responsible use of nanotechnology. In conclusion, nanotechnology holds great promise for revolutionizing modern science and technology. Its wide-ranging applications and potential benefits make it one of the most important advancements of the 21st century, with the ability to significantly improve quality of life and address global challenges.

Keywords: Nanotechnology, Nanomedicine, Drug Delivery, Nanoscale Electronics

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APP ABSTRACT - APP 2026 - 114

PHARMACOKINETICS OF NOVEL DRUG DELIVERY SYSTEMS

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Abstract

The advancement of pharmaceutical sciences has led to the emergence of novel drug delivery systems (NDDS), which are designed to overcome the limitations of conventional dosage forms and optimize therapeutic outcomes. Pharmacokinetics plays a crucial role in evaluating the performance of these advanced systems by studying the absorption, distribution, metabolism, and excretion (ADME) of drugs within the body. Novel drug delivery systems, including nanoparticles, liposomes, microspheres, transdermal patches, and targeted delivery carriers, significantly alter the pharmacokinetic profile of drugs. These systems enhance bioavailability, improve drug stability, prolong circulation time, and enable site-specific targeting, thereby reducing toxicity and side effects. By modifying drug release patterns—such as sustained, controlled, or stimuli-responsive release—NDDS ensure a more predictable and efficient therapeutic response. Pharmacokinetic evaluation of NDDS involves advanced modeling and analytical techniques to understand parameters such as half-life, clearance, volume of distribution, and peak plasma concentration. The integration of nanotechnology and biotechnology in drug delivery has further refined pharmacokinetic behavior, enabling precision medicine and personalized therapy. Despite these advantages, challenges such as complex formulation design, variability in biological response, regulatory hurdles, and large-scale manufacturing remain significant concerns. Therefore, comprehensive pharmacokinetic studies are essential to ensure safety, efficacy, and reproducibility of these systems. In conclusion, the pharmacokinetics of novel drug delivery systems provides critical insights into drug behavior, supporting the development of more effective and safer therapeutic strategies. Continued research in this field holds great promise for revolutionizing modern medicine and improving patient outcomes.

Keywords: PKa, Drug Delivery, microspheres, transdermal patches, NDDS

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APP ABSTRACT - APP 2026 - 115

ROLE OF NANOTECHNOLOGY IN LUNG CANCER THERAPY

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Abstract

One of the main causes of cancer-related death globally, lung cancer presents a major obstacle to successful treatment. Despite their widespread usage, conventional therapeutic procedures including chemotherapy, radiation, and surgery frequently have poor efficacy and serious systemic adverse effects because of their non-specific medication distribution. Nanotechnology has been a viable approach to improve lung cancer treatment's efficacy and safety in recent years. To enhance the delivery of anticancer medications, nanotechnology uses nanoscale drug delivery methods such liposomes, polymeric nanoparticles, dendrimers, and lipid-based nanoparticles. By improving drug solubility, stability, and bioavailability, these nanocarriers make it possible for medications to more effectively enter tumor tissues.One of the key advantages of nanoparticle-based drug delivery is the enhanced permeability and retention (EPR) effect, which enables nanoparticles to accumulate preferentially in tumor tissues due to the leaky vasculature of tumors.Furthermore, nanoparticles can be functionalized with specific ligands or antibodies that target receptors overexpressed on lung cancer cells, enabling active targeting and improving therapeutic outcomes. Nanotechnology also enables controlled and sustained drug release, which helps maintain effective drug concentrations at the tumor site while minimizing toxicity to healthy tissues.Recent advances in nanomedicine have also introduced theranostic nanoparticles that combine diagnostic imaging and therapeutic functions, allowing early detection and personalized treatment strategies. Overall, nanotechnology holds great potential to overcome the limitations of conventional therapies and offers a promising platform for the development of safer and more effective treatments for lung cancer. All things considered, nanotechnology has enormous potential to overcome the drawbacks of traditional therapies and provides a viable foundation for the creation of safer and more potent lung cancer treatments.

Keywords: Nanotechnology, Lung cancer, Nanoparticles, Targeted drug delivery, Nanomedicine.

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APP ABSTRACT - APP 2026 - 116

PHARMACOLOGICAL SCREENING OF ANALGESIC AND ANTI-INFLAMMATORY ACTIVITY OF SIDA ACUTA BURM

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Abstract

Aim: Pain and inflammation are the major health problems commonly treated with traditional remedies mainly using medicinal plants. Sida acuta Burm is one of such medicinal plants used in folkloric medicine of India. However, the plant has not been scientifically evaluated. The aim of this study was to evaluate analgesic and anti-inflammatory effects of the 80% methanol leaves extract of Sida acuta Burm using rodent models. Method. The central and peripheral analgesic effect of the extract at 100, 200, and 400 mg/kg dose levels was evaluated using hot plate and acetic acid induced writhing rodent models, whereas carrageenan induced paw edema and cotton pellet granuloma methods were used to screen anti-inflammatory effect of the extract at the same dose levels. Acute toxicity test was also done. Data were analyzed using one-way ANOVA followed by Tukey's post hoc test and $P < 0.05$ was considered significant. Results. The extract did not produce mortality up to 2000 mg/kg. All tested doses of the extract showed significant analgesic effect with maximum latency response of 62.8% and inhibition of acetic acid induced writing. Maximum anti-inflammatory effect was recorded at 6 h after induction, with 75.88% reduction in carrageenan induced paw edema. Moreover, all tested doses of extract significantly inhibited the formation of inflammatory exudates and granuloma formation ($p < 0.001$).

Conclusion: The study indicated that the extract was safe in mice and it has both analgesic and anti-inflammatory effect in rodent models.

Keywords: Sida acuta Burm, Ethnomedicinal, Phytochemical, Analgesic and Anti-inflammatory activity.

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DEGRADATION STUDY OF EXPIRED DRUG AND EXTANT METOPROLOL FORMULATION BY UV VISIBLE SPECTROSCOPY

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Abstract

Hypertension is a major health problem throughout the world because of its high prevalence and its association with increased risk of cardiovascular disease. The ultimate goal in treatment of the hypertensive patient is to achieve the maximum reduction in the long-term total risk of cardiovascular mobility and mortality. Antihypertensive drugs are used to treat high blood pressure. Metoprolol is a selective adrenergic beta-1 blocking agent that is commonly used to treat angina pectoris, hypertension and cardiac arrhythmias. Forced degradation studies are also known as stress testing, stress studies, stress decomposition studies, forced decomposition studies, etc. The present study involves the comparison of forced degradation studies such as acid and alkali hydrolytic degradation of Metoprolol in their standard drug, extant and expired dosage forms.

Metoprolol was soluble in water so λmax of drug was identified by measuring UV-Visible spectrum in the range of 800-200 nm in distilled water and it was found to be 223nm.Calibration curve of drug plotted in the obtained λmax and the curves found to be linear in the selected concentration range 3-15 µg/mL. Percentage purity of extant and expired drugs was calculated. Forced degradation of drugs was performed by using 0.1MHCl and 0.1M NaOH. Degraded samples were quantified by UV-Visible spectroscopic method and percentage degradation was calculated. In all the methods used in degradation study, expired dosage form undergoes greater degradation when compared with that of extant and standard drugs. Formetoprolol, it undergoes more degradation in NaOH when compared to HCl.Index Terms – UV-Visible spectroscopy, Metoprolol, extant, expired & forced degradation.

Keywords: Hypertension, Metoprolol, Forced degradation studies, UV-Visible spectroscopy, Acid and alkali hydrolysis

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APP ABSTRACT - APP 2026 - 118

RP-HPLC METHOD DEVELOPMENT AND VALIDATION OF DASATINIB AND PYRIDOXINE HYDROCHLORIDE IN THEIR COMBINED TABLET DOSAGE FORM

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Abstract

Methodology consists of the general principle in HPLC instrumentation protocol for method development and the detail about the proposed RP-HPLC method on the drug is included. Where the RP-HPLC method in which determination of Dasatinib and Pyridoxine HCl was carried out on a Symmetry C18 (4.6 x 150mm, 5m, Make: Waters) using a mobile phase consisting of pH 3.5 phosphate buffer: Acetonitrile (30:70). The mobile phase was pumped at a rate of 1.0 ml/min and the detection was carried out at 254nm. The retention time of Dasatinib and Pyridoxine HCl was found to be 2.162 and 3.305 min respectively and linearity was in the range of 12-60µg / ml for Pyridoxine HCl and 20-100µg / ml for Dasatinib. The results obtained in the newer RP-HPLC method for determination of Dasatinib and Pyridoxine HCl are tabulated and also discussed about the developed RP-HPLC method. The proposed method is simple, cost effective and gives reliable assay results with short analysis time (5min).The content of drugs in the formulation was found to be 60mg Pyridoxine HCl and 100mg Dasatinib. The method was validated in terms of sensitivity, accuracy and precision and can be used for the routine determination of Dasatinib and Pyridoxine HCl in pharmaceutical formulations. The above method does not suffer from any interference due to common excipients. Therefore the proposed RP-HPLC method could be
successfully applied to estimate commercial pharmaceutical products containing Dasatinib and Pyridoxine HCl.

Keywords: Symmetry C18, Dasatinib and Pyridoxine, RP-HPLC

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APP ABSTRACT - APP 2026 - 119

Comparative GC–MS/MS Analysis and Method Validation for Identification of Pesticide Residues in Paddy Field Water Samples Using Standard Chromatographic Profiles

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Abstract

The extensive use of pesticides in paddy cultivation has raised serious concerns regarding environmental contamination and associated human health risks. The present study focuses on the identification and comparative analysis of pesticide residues in water samples collected from paddy field ecosystems using Gas Chromatography–Tandem Mass Spectrometry (GC–MS/MS).

Standard solutions of commonly used organophosphorus pesticides were first analyzed to establish reference retention times and characteristic chromatographic patterns for accurate identification. These standard chromatograms served as analytical references for comparison with the chromatographic profiles obtained from environmental samples. Water samples collected from paddy fields were subjected to liquid–liquid extraction using dichloromethane, followed by purification with anhydrous sodium sulphate and concentration using a rotary evaporator. The concentrated extracts were filtered and analyzed using GC–MS/MS equipped with an HP-5MS column under optimized operating conditions. Method validation parameters such as linearity, precision, sensitivity, and reproducibility were evaluated to ensure the reliability of the analytical method. Calibration curves for the standard pesticides showed good linearity within the selected concentration range with satisfactory correlation coefficients. The analytical method demonstrated adequate sensitivity for detecting trace levels of pesticide residues.

Comparative evaluation of sample chromatograms with those of the standard pesticides revealed peaks corresponding to similar retention times, suggesting the presence of quinalphos, dimethoate, malathion, methyl parathion, and chlorpyrifos. The study highlights the effectiveness of GC–MS/MS as a reliable technique for monitoring pesticide contamination in agricultural environments.

Keywords: GC–MS/MS, Pesticide Residues, Paddy Field Water, Organophosphorus Pesticides, Chromatographic Comparison, Environmental Monitoring.

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APP ABSTRACT - APP 2026 - 120

FECAL MICROBIOTA TRANSPLANTATION FOR DECOLONIZATION OF MULTIDRUG-RESISTANT ORGANISMS:AN EMERGING STRATEGY AGAINST ANTIMICROBIAL RESISTANCE

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Abstract

Antimicrobial resistance has traditionally been confronted with escalating pharmacologic force, yet the gut, which is a primary ecological reservoir of multidrug-resistant organisms(MDROs) has remained an underexploited therapeutic target. Conventional decolonization strategies largely antibiotic-driven often provide transient benefits while reinforcing resistance.This review explores the evolving role of Fecal Microbiota Transplant (FMT) as a therapeutic strategy for MDRO decolonization, synthesizing evidence from clinical trials, observational studies and mechanistic microbiome research. Comparative analyses highlight the limitations of traditional decolonization approaches and position FMT as a potentially paradigm-shifting alternative. FMT, long established for recurrent Clostridioides difficile infection, is now being explored for its ability to restore colonization resistance and disrupt intestinal dominance of MDROs such as Carbapenem-resistant Enterobacteriaceae, extended-spectrum β-lactamase- producing organisms and Vancomycin-resistant Enterococcus. Emerging clinical evidence suggests that FMT can reduce MDRO carriage, lower resistome burden and potentially decrease infection recurrence by reconstituting microbial diversity and metabolic functionality. However, questions surrounding durability, safety, optimal patient selection and standardization continue to challenge widespread implementation. This review synthesized current mechanistic insights and clinical evidence supporting FMT for MDRO decolonization, critically compares it with conventional strategies and examines key safety and durability considerations. This further explore future directions, including precision microbiome therapeutics, defined microbial consortia and integration with antimicrobial stewardship programs. By reframing MDRO decolonization through an ecological system, this article highlights how microbiome restoration may shift the paradigm from pathogen eradication to ecosystem rehabilitation. Understanding whether FMT represents a transitional solution or a cornerstone in the fight against antimicrobial resistance remains a pressing and provocative question for modern medicine.

Keywords: Fecal microbiota transplantation, multidrug-resistant organism, antimicrobial resistance, colonization resistance, antimicrobial stewardship.

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MICRONEEDLE-ASSISTED DRUG DELIVERY FOR IMPROVED BIOAVAILABILITY

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Abstract

Drug bioavailability is a critical factor that determines the therapeutic effectiveness of manypharmaceutical agents. Conventional drug delivery routes such as oral and parenteraladministration often face limitations including poor absorption, enzymatic degradation in thegastrointestinal tract, and extensive first-pass metabolism in the liver. These challenges reduce the amount of active drug reaching systemic circulation.Microneedle-assisted drug delivery has emerged as an innovative transdermal approach designed to overcome these barriers and improve drug bioavailability.Microneedles are micron-sized needle structures that create temporary
microchannels in the skin, enabling drugs to bypass the outermost barrier layer, the stratumcorneum, without causing significant pain or tissue damage. This technology allows directdelivery of drugs into the epidermal or dermal layers, enhancing absorption and therapeutic efficiency.Various types of microneedles such as solid, coated, dissolving, and hollow microneedles have been developed to deliver a wide range of therapeutic agents including vaccines, peptides, proteins, and small-molecule drugs.Microneedle systems offer several advantages including painless administration, improved patient compliance, controlled drug release, reduced risk of infection, and minimal invasiveness compared to conventional injections. In addition, they provide a promising platform for targeted and sustained drug delivery. Due to these benefits, microneedle-based systems are gaining significant attention in modern pharmaceutical research and development.This review focuses on the principle, types, mechanism of drug delivery, and advantages of microneedle technology, highlighting its potential role in enhancing drug bioavailability and improving therapeutic outcomes.

Keywords: Microneedles, Transdermal Drug Delivery, Bioavailability, Skin Permeation, Drug Delivery Systems

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APP ABSTRACT - APP 2026 - 122

ENHANCEMENT OF SOLUBILITY IN POORLY WATER-SOLUBLE DRUGS: MODERN PHARMACEUTICAL APPROACHES

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Abstract

Poor aqueous solubility is a major challenge in pharmaceutical drug development, as nearly 40–50% of newly discovered drugs exhibit low water solubility. Poorly soluble drugs often show slow dissolution rates, low bioavailability, and reduced therapeutic effectiveness. Therefore, improving the solubility of such drugs is an important goal in pharmaceutics. Several strategies have been developed to enhance drug solubility and dissolution rate. Physical techniques such as particle size reduction, micronization, and solid dispersion increase the surface area of drugs and improve dissolution. Chemical approaches including salt formation, prodrug design, and complexation with cyclodextrins also enhance solubility. In addition, formulation methods such as the use of surfactants, co-solvents, and lipid-based drug delivery systems help improve drug wettability and absorption. Recent advances in nanotechnology, including nanoparticles, nano emulsions, and nanosuspensions, have further improved the solubility and bioavailability of poorly water-soluble drugs. These techniques significantly enhance drug dissolution, therapeutic efficacy, and patient compliance. Thus, solubility enhancement plays a crucial role in the successful development of effective pharmaceutical formulations.

Keywords: Poorly water-soluble drugs, Solubility enhancement, Solid dispersion, Nanotechnology,

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APP ABSTRACT - APP 2026 - 123

REGULATORY T-CELL IMMUNOTHERAPY AND FOXP3 GENE TARGETING IN RHEUMATOID ARTHRITIS: EMERGING CURATIVE STRATEGIES

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Abstract

Rheumatoid arthritis (RA) is a chronic autoimmune inflammatory disorder characterized by synovial inflammation, progressive joint destruction, and systemic immune dysregulation. A growing body of evidence suggests that an imbalance between pro-inflammatory effector T-cells and immunosuppressive regulatory T-cells (Tregs) plays a crucial role in RA pathogenesis. Tregs expressing the transcription factor FOXP3 are essential for maintaining immune tolerance by inhibiting autoreactive immune responses and controlling inflammatory cytokine production. However, in RA patients, functional impairment, altered migration, and reduced suppressive activity of $FOXP3^+$ Tregs have been reported, contributing to persistent inflammation and disease progression. Recent therapeutic advances have focused on restoring immune homeostasis through regulatory T-cell-based immunotherapy. Strategies such as adoptive transfer of ex-vivo expanded Tregs, induction of $CD8^+$ $FOXP3^+$ regulatory T-cells, and targeted modulation of FOXP3 gene expression are being explored as potential disease-modifying approaches. Additionally, biological therapies including tumor necrosis factor inhibitors have been shown to partially restore Treg function and improve clinical outcomes in RA. Emerging research highlights the importance of enhancing Treg stability, improving tissue homing to inflamed synovium, and preventing inflammatory conversion to achieve sustained remission. Despite promising results, challenges related to therapeutic safety, long-term efficacy, and large-scale cell expansion remain. Overall, regulatory T-cell immunotherapy and FOXP3 gene targeting represent innovative translational strategies with the potential to restore immune tolerance and provide near-curative treatment options for patients with rheumatoid arthritis.

Keywords: Regulatory T-cells, FOXP3 gene, Rheumatoid arthritis, Immune tolerance, Treg immunotherapy.

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APP ABSTRACT - APP 2026 - 124

AI-BASED ALZHEIMER'S DISEASE DRUG REPURPOSING STRATEGIES OPTIMISATION

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Abstract

Memory loss, cognitive decline, and difficulties with day-to-day functioning are the hallmarks of Alzheimer's disease (AD), a progressive neurological illness. Effective disease-modifying treatments are still scarce despite a great deal of study. Conventional drug discovery is expensive and time-consuming. By finding novel therapeutic applications for already-approved medications, artificial intelligence (AI) and machine learning (ML) have become effective instruments for speeding up drug repurposing. In order to find possible anti-Alzheimer's drugs, AI makes it possible to quickly examine vast biomedical databases, molecular interactions, and diseasepathways. Using terms like "Artificial Intelligence," "Drug Repurposing," "Alzheimer's Disease," and "Machine Learning," a thorough literature search was carried out using PubMed, Scopus, and Google Scholar. Included were studies on molecular docking techniques for AD, network pharmacology, and AI-driven prediction models. Several studies showed that AI models, such as deep learning and network-based algorithms, were effective in identifying possible repurposed medications that targeted neuroinflammation, tau protein pathology, and amyloid-beta aggregation. When compared to traditional methods, AI-assisted systems greatly decreased screening time and increased prediction accuracy.

In conclusion, AI-based drug repurposing is a viable and economical approach to quickening the development of treatments for Alzheimer's disease. In order to improve therapeutic precision, future research should concentrate on clinical validation and the integration of multi-omics data.

Keywords: Artificial Intelligence, Drug Repurposing, Alzheimer’s Disease, Machine Learning, Neurodegeneration.

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APP ABSTRACT - APP 2026 - 125

EXOSOME-BASED NANOCARRIERS FOR TARGETED DRUG DELIVERY IN CANCER THERAPY

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Abstract

Cancer remains one of the leading causes of death worldwide and continues to pose a major challenge to healthcare systems. Although conventional chemotherapy is widely used in cancer treatment, it often causes serious side effects due to non-specific drug distribution and damage to healthy tissues. In addition, many anticancer drugs show limited effectiveness because of poor targeting and the development of drug resistance. To overcome these limitations, researchers have increasingly focused on developing advanced drug delivery systems that can improve treatment outcomes. Among these emerging approaches, exosomes have gained attention as promising natural nanocarriers for targeted cancer therapy.

Exosomes are small extracellular vesicles, generally ranging from 30 to 150 nm in size, that are naturally released by various types of cells. They play an important role in cell-to-cell communication by transferring biological molecules such as proteins, lipids, and nucleic acids. Because of their natural origin, exosomes exhibit high biocompatibility, low immunogenicity, and good stability in the bloodstream. These characteristics make them suitable vehicles for delivering therapeutic agents directly to tumor cells. Recent studies have shown that anticancer drugs such as doxorubicin and paclitaxel can be effectively incorporated into exosomes, leading to improved drug delivery and enhanced targeting of cancer cells. In addition, exosomes have demonstrated potential for transporting genetic materials such as small interfering RNA and microRNA, which can regulate gene expression and inhibit tumor growth.

Despite these promising advantages, several challenges still limit the clinical application of exosome-based drug delivery systems. Issues such as large-scale production, efficient drug loading, and standardized isolation techniques require further investigation. Continued research in this area may contribute to the development of more precise and safer therapeutic strategies. Overall, exosome nanocarriers represent a promising and innovative platform for improving targeted cancer therapy.

Keywords: Exosomes, Nanocarriers, Targeted drug delivery, Precision oncology, Cancer therapy.

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APP ABSTRACT - APP 2026 - 126

DEVELOPMENT AND EVALUATION OF *CLITORIA TERNATEA* EXTRACT–LOADED ORODISPERSIBLE FILMS AS A NOVEL ANTIOXIDANT DELIVERY SYSTEM

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Abstract

Oxidative stress plays a significant role in the progression of chronic diseases by causing cellular harm through reactive oxygen species (ROS). Increasing interest has been shown in natural antioxidants as safer substitutes for synthetic compounds like butylated hydroxyanisole and butylated hydroxytoluene. *Clitoria ternatea* (Fabaceae), often referred to as butterfly pea, is abundant in flavonoids and anthocyanins that demonstrate strong antioxidant and neuroprotective properties. The purpose of this study was to formulate and assess *Clitoria ternatea* extract-loaded Orodispersible films (ODFs) as an innovative phytopharmaceutical product aimed at improving antioxidant effectiveness, stability, and patient adherence**.**

Aqueous extracts from the flowers were integrated into hydroxypropyl methylcellulose (HPMC) polymer matrices via the solvent casting technique. The resulting ODFs were analyzed for their physicochemical properties, mechanical strength, disintegration time, swelling index, and in vitro dissolution. Antioxidant potential was evaluated using DPPH, hydrogen peroxide scavenging, and ferric reducing antioxidant power (FRAP) assays. Spectroscopic (UV–Vis), thermal (DSC), and X-ray diffraction (XRD) analysis were conducted to examine the structural and compatibility characteristics.The optimized films were homogeneous, flexible, and dissolved rapidly (30 ± 2 s), exhibiting excellent folding endurance (>120). Antioxidant tests indicated concentration-dependent radical scavenging activity with IC_{50} values similar to those of the crude extract, confirming the preservation of phytochemical efficacy. DSC and XRD studies revealed that the extract was molecularly dispersed within the polymer matrix, suggesting an enhanced amorphous nature. The developed *Clitoria ternatea* ODFs demonstrated significant antioxidant activity, stability, and rapid dissolution, indicating their potential as a novel and user-friendly delivery system for natural antioxidants in managing oxidative stress**.**

Keywords: Clitoria ternatea, Orodispersible film, Antioxidant activity, Phytopharmaceutical formulation, Oxidative stress

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APP ABSTRACT - APP 2026 - 127

DoE-ORIENTED ISOCRATIC HPLC OPTIMIZATION OF AZOLE ANTIFUNGALS IN COMBINED PHARMACEUTICAL DOSAGE FORM

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Abstract

A simple, consistent and reasonable isocratic RP-high performance liquid chromatography (RP-HPLC) approach was developed and optimized for the concurrent determination of Ornidazole and Miconozole in bulk and tablet dosage forms. HPLC analysis illustrated satisfactory separation of Ornidazole and Miconozole and optimal resolution was attained with C18 column using methanol, 5mM Ammonium acetate in the ratio 40:60 v/v at pH 4.8 as the mobile phase and UV detection at 276 nm. A unique chromatogram and spectra for Ornidazole and Miconozole were able to be envisioned by developed methods, which are analogous to the sample results. The calibration curve's observed linearity for ORZ and MCZ at selected concentration range. Recovery studies investigated the approach's accuracy with percentage recovery ranges between 97.33% and 98.33%. The developed techniques were verified in terms of precision, accuracy and linearity. Quality by design (QbD) was employed to optimize the accurate ratio mobile phase, pH, flow rate and its impact on retention time and peak area. The validation outcomes met the acceptance criteria as per ICH recommendations and found to be reliable for the routine examination of drugs in therapeutic formulations. The developed methodology can be used for quantitative determination of Ornidazole and Miconozole combination in pharmaceutical formulations without the immersion of additional diluents or excipients.

Keywords: HPLC, Ornidazole, Miconozole, Antifungal, Pharmaceutical formulations.

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APP ABSTRACT - APP 2026 - 128

ANALYTICAL METHOD DEVELOPMENT AND VALIDATION OF RP-HPLC AND UPLC TECHNIQUES FOR STABILITY-INDICATING SIMULTANEOUS ESTIMATION OF ANTI- CANCER COMBINATION DRUGS IN FORMULATED DOSAGE FORMS

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Abstract

The development and validation of robust analytical methods are essential for ensuring the quality, safety, and therapeutic efficacy of anti-cancer drug formulations. With the increasing complexity of combination therapies, reliable analytical tools are required to simultaneously estimate multiple active pharmaceutical ingredients in formulated dosage forms. Reverse Phase High-Performance Liquid Chromatography (RP-HPLC) and Ultra-Performance Liquid Chromatography (UPLC) have emerged as powerful techniques that address these demands, offering high sensitivity, reproducibility, and rapid analysis. This review consolidates recent advancements in method development strategies, with particular emphasis on stability-indicating assays capable of monitoring degradation products, impurities, and drug–drug interactions. In parallel, advances in nanotechnology drug development and pharmaceutical sciences are revolutionizing formulation design, further necessitating precise analytical tools to evaluate nanoscale drug delivery systems and complex therapeutic combinations.Parameters such as linearity, precision, accuracy, robustness, and specificity, as outlined in International Council for Harmonization (ICH) guidelines, are discussed to highlight best practices in ensuring regulatory compliance. Comparative evaluation of RP-HPLC and UPLC demonstrates that while RP-HPLC remains widely adopted for routine quality control due to its accessibility and cost-effectiveness, UPLC offers superior resolution, faster run times, and enhanced sensitivity, making it particularly valuable for complex formulations and stability studies. Moreover, advances in nanotechnology drug development and pharmaceutical sciences have introduced novel delivery platforms—such as liposomes, nanoparticles, and polymeric carriers—that demand highly sensitive analytical validation to ensure therapeutic consistency and safety. Ultimately, RP-HPLC and UPLC remain pivotal in ensuring the safety, efficacy, and quality of oncology therapeutics, while future advancements in analytical sciences and nanotechnology will continue to shape the global landscape of pharmaceutical research and quality assurance.

Keywords: RP-HPLC; UPLC; Stability-indicating methods; Method validation; Anti-cancer combination drugs; Formulated dosage forms; Simultaneous estimation; Pharmaceutical quality control; Nanotechnology drug development; Pharmaceutical sciences

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APP ABSTRACT - APP 2026 - 129

SELF-EMULSIFYING DRUG DELIVERY SYSTEMS (SEDDS): AN ADVANCED APPROACH FOR ENHANCING ORAL BIOAVAILABILITY OF POORLY WATER-SOLUBLE DRUGS

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Abstract

Poor aqueous solubility is one of the major challenges in pharmaceutical drug development, as many therapeutic compounds exhibit limited absorption in the gastrointestinal tract, resulting in reduced bioavailability and therapeutic efficacy. Self-Emulsifying Drug Delivery Systems (SEDDS) have emerged as an effective formulation strategy to overcome this limitation. SEDDS are isotropic mixtures composed of oils, surfactants, co-surfactants, and lipophilic drugs that spontaneously form fine oil-in-water emulsions when exposed to gastrointestinal fluids under mild agitation produced by gastric motility. This spontaneous emulsification process significantly enhances the surface area of the drug, leading to improved dissolution and increased absorption across the intestinal membrane.

The successful formulation of SEDDS depends on the appropriate selection of lipid components, surfactants, and co-solvents to ensure stable emulsification and efficient drug release. These systems provide several advantages including improved oral bioavailability, reduced variability in drug absorption, protection of drugs from enzymatic and chemical degradation, and relatively simple manufacturing processes. SEDDS have been successfully applied to enhance the bioavailability of several poorly water-soluble drugs such as cyclosporine, ritonavir, and ketoconazole. In recent years, growing interest in lipid-based drug delivery systems has further highlighted the importance of SEDDS in pharmaceutical research. Therefore, SEDDS represent a promising and innovative approach for improving solubility, absorption, and overall pharmacokinetic performance of lipophilic drugs.

Keywords: Self-Emulsifying Drug Delivery Systems, SEDDS, Oral bioavailability, Lipid-based drug delivery, Poorly water-soluble drugs, Drug solubility enhancement.

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APP ABSTRACT - APP 2026 - 130

AI-POWERED EARLY RISK PREDICTION TO MINIMIZE LATE-STAGE CLINICAL TRIAL FAILURE: A COST-REDUCTION STRATEGY IN DRUG DEVELOPMENT

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Abstract

Late-stage clinical trial failure remains one of the most significant challenges in pharmaceutical research and development. Phase II and Phase III trials require substantial financial investment, yet a considerable proportion of drug candidates fail during these stages due to limited efficacy, unforeseen safety issues, inadequate patient stratification, or suboptimal study design. Industry reports indicate that nearly 80–90% of investigational compounds do not achieve regulatory approval, resulting in major economic losses and delayed therapeutic innovation. These persistent challenges highlight the need for predictive strategies that can identify risk earlier in the development process.Artificial Intelligence (AI) has emerged as a powerful tool to enhance early decision-making in drug development. Machine learning and deep learning models can analyze complex, multidimensional datasets, including genomic data, biomarker profiles, pharmacokinetic parameters, real-world evidence, and historical trial outcomes. By identifying patterns not easily detectable through conventional analysis, AI systems can estimate the probability of technical and regulatory success before progression to costly late-stage trials. Emerging studies suggest that predictive analytics improves early efficacy assessment, detects potential safety liabilities, optimizes patient selection, and supports more efficient trial design. The integration of AI-driven predictive frameworks enables earlier discontinuation of low-probability candidates, reducing unnecessary expenditure and improving resource allocation. Overall, AI-powered early risk prediction represents a strategic shift toward data-driven drug development, enhancing trial success rates while helping to control escalating research and development costs.

Keywords: Artificial Intelligence; Pharmaceutical Chemistry; Drug Discovery; Safety Evaluation; Machine Learning.

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APPLICATION OF MOLECULAR DOCKING AND CADD IN NEURODEGENERATIVE DISEASES

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Abstract

NDs (neurodegenerative diseases), including Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis and Huntington's disease, are some of the most common chronic illnesses worldwide. These disorders mainly affect the brain and nervous system; at this time, there is no complete treatment available for any type of NDs. Finding effective treatments for NDs continues to be a major challenge in medical research. The use of computer-aided drug design (CADD) has become an essential resource for drug discovery today. By allowing scientists to identify and sort potential drug compounds through computer-based techniques prior to laboratory testing, CADD can significantly reduce the number of compounds that would require experimental testing and thereby minimize the amount of time, cost, and effort applied to drugs during their development. This article reviews how CADD and molecular docking techniques are used to develop drug candidates targeting NDs. It describes several therapeutically relevant targets of new drug treatments for NDs. The limitations associated with CADD and molecular docking techniques are also referenced; however, CADD will continue to be a major asset in the discovery process of new drugs for NDs.

Keywords: Alzheimer's disease; Parkinson's disease; CADD; neurodegenerative diseases; molecular docking; drug discovery.

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APP ABSTRACT - APP 2026 - 132

RECENT ADVANCES IN MOUTH DISSOLVING TABLET TECHNOLOGY: A REVIEW OF FORMULATION, EVALUATION, AND INNOVATIONS

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Abstract

Mouth dissolving tablets (MDTs), also called Orally Disintegrating Tablets, are a useful type of oral dosage form that dissolves quickly in the mouth without water. They are particularly helpful for children, elderly patients, and anyone who has trouble swallowing regular tablets. This review highlights the different ways MDTs are made, their quality evaluation, and recent improvements in their technology. Common methods of preparation include direct compression, freeze-drying, sublimation, and spray drying, which help tablets disintegrate fast and deliver drugs effectively. Quality checks such as disintegration time, hardness, friability, and drug release studies are important to ensure their performance. Recently, advances like better superdisintegrants, taste-masking strategies, and modern manufacturing techniques have improved their efficiency and patient acceptability. Overall, MDTs provide a simple, convenient, and patient-friendly approach in modern drug delivery systems.

Keywords: Mouth Dissolving Tablets; Orally Disintegrating Tablets; Formulation; Superdisintegrants; Taste Masking; Patient Compliance

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APP ABSTRACT - APP 2026 - 133

Combating Blood–Brain Barrier Limitations and Drug Resistance in Glioblastoma Using Lipid Nanoparticle-Based Drug Delivery.

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Background: Brain tumors, especially glioblastoma multiforme(GBM), continue to be one of the deadliest cancers, with a median survival rate of 12 to 15 months. The blood-brain barrier (BBB) and drug resistance through multiple mechanisms — primarily P-glycoprotein efflux, MGMT-mediated DNA repair, and the adaptability of cancer stem cells — greatly hinder the effectiveness of standard chemotherapy, such as temozolomide (TMZ).

Objective: This assessment examines lipid nanoparticle (LNP) approaches—such as solid lipid nanoparticles (SLNs), nanostructured lipid carriers (NLCs), liposomes, and ionizable LNPs—as targeted delivery mechanisms to surmount the BBB and drug resistance in brain tumors.

Result: Surface-modified NLCs with polyunsaturated fatty acid ligands (ALA, GLA) demonstrated BBB permeability (Papp ~1.9 × 10^{-3} cm/s) and resulted in up to 13.9-fold decreases in IC50 for patient-derived GBM cells compared to the free drug. Receptor-targeted LNPs (transferrin, anti-EGFR) achieved 3–5 times greater intracranial drug concentrations in orthotopic rodent models. The co-encapsulation of TMZ alongside P-gp inhibitors or the silencing of MGMT/BCL-2 using siRNA restored chemoresistance by 60 80%. LNPs that respond to stimuli and utilize the tumor's acidic microenvironment allowed for regulated drug release, reducing off-target toxicity.

Conclusion:LNPs provide a versatile, biocompatible solution for achieving concurrent BBB t raversal and multi-target resistance reversal in brain tumors LNP with PUFA also should dual action drug delivery in treating brain tumor. Innovations in surface engineering, co-delivery, and stimuli-responsive design offer significant potential for personalized, low-toxicity neuro-oncology treatments, contingent on scalable production and clinical validation

Keywords: lipid nanoparticles; glioblastoma; blood-brain barrier; drug resistance; targeted delivery; temozolomide; nanostructured lipid carriers; siRNA; neuro-oncology

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APP ABSTRACT - APP 2026 - 134

SOLID LIPID NANOPARTICLE ENCAPSULATED BETA-CAROTENE FOR IMMUNOMODULATORY ACTIVITY: NETWORK PHARMACOLOGY, MOLECULAR DOCKING, AND INVITRO EVALUATION

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Abstract

The present study aimed to develop and evaluate a novel solid lipid nanoparticle (SLNP)–based herbal formulation for enhanced immunomodulatory activity. Herbal bioactives often suffer from poor solubility, low bioavailability, and limited stability, which restrict their therapeutic potential. To overcome these limitations, the selected herbal extract was incorporated into SLNPs using an optimized lipid-based nanoparticulate delivery system. The formulation was prepared by a suitable method such as hot homogenization followed by ultrasonication and systematically optimized.The prepared SLNPs were characterized for particle size, polydispersity index, zeta potential, entrapment efficiency, surface morphology, and in-vitro drug release profile. Compatibility studies confirmed the absence of significant interactions between the herbal extract and excipients. The optimized formulation exhibited nanoscale particle size, good stability, high entrapment efficiency, and a sustained release pattern.Immunomodulatory activity of the developed formulation was evaluated using appropriate in-vitro and/or in-vivo models and compared with the plain herbal extract. The SLNP-based herbal formulation demonstrated enhanced immune response, indicating improved bioavailability and therapeutic performance.In conclusion, the developed SLNP-based herbal delivery system represents a promising approach for improving the immunomodulatory efficacy of herbal bioactives and may serve as a potential candidate for further preclinical and clinical investigations.

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APP ABSTRACT - APP 2026 - 135

AI-ASSISTED OPTIMIZATION OF NANOPARTICLE DRUG DELIVERY FOR ANTIDIABETIC THERAPY

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Abstract

Type 2 Diabetes Mellitus is one of the most current habitual metabolic diseases worldwide and requires effective long- term medicine remedy. Conventional medicine delivery systems frequently face limitations similar as poor bioavailability, on-targeted medicine distribution, and inconsistent remedial response. Nanoparticle- grounded medicine delivery systems have surfaced as a promising approach to ameliorate medicine stability, enhance immersion, and enable controlled medicine release. still, optimizing nanoparticle phrasings requires assessing multiple physicochemical and natural parameters, which can be complex and time consuming using traditional experimental styles.

In this study, an Artificial Intelligence (AI) – grounded prophetic model was developed to estimate the medicine delivery effectiveness of nanoparticle phrasings used for antidiabetic remedy. A dataset conforming of 150 samples was constructed using physicochemical parcels of generally used antidiabetic medicines attained from chemical databases similar as PubChem, along with nanoparticle expression parameters and patient metabolic factors reported in scientific literature. The dataset included variables similar as medicine name, molecular weight, solubility, nanoparticle size, face charge, body mass indicator (BMI), age, and glucose position. A Random Forest machine learning algorithm was applied to dissect the relationship between these parameters and prognosticated medicine delivery effectiveness.

The results indicate that AI- grounded prophetic modelling can support the evaluation of nanoparticle medicine delivery systems and help experimenters in relating effective phrasings for bettered operation of Type 2 Diabetes.

Keywords:

Artificial Intelligence, Nanoparticle Drug Delivery, Type 2 Diabetes Mellitus, Machine Learning, Drug Delivery Efficiency, Nanomedicine, Random Forest Algorithm

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APP ABSTRACT - APP 2026 - 136

DENDRIMERS AS NOVEL NANOCARRIERS IN TRANSDERMAL DRUG DELIVERY SYSTEMS

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Abstract

Transdermal Drug Delivery Systems (TDDS) are widely used because they are easy to administer, improve patient compliance, and provide controlled and sustained drug release with fewer systemic side effects. However, the main limitation of TDDS is the poor permeation of drugs through the skin. The outermost skin layer, the stratum corneum, acts as a strong protective barrier that restricts the penetration of many drugs.

To overcome this challenge, researchers have developed nanocarrier-based drug delivery systems. Among these, dendrimers have gained significant attention. Dendrimers are highly branched polymeric nanostructures with a well-defined architecture, allowing high drug loading capacity, improved solubility, and enhanced skin permeation. Their unique structure also enables better interaction with biological membranes, making them effective carriers for transdermal drug delivery.

Other nanocarriers such as liposomes, solid lipid nanoparticles, nanostructured lipid carriers, nano emulsions, transferosomes, and microemulsions have also been studied to improve drug delivery through the skin. Additionally, both passive methods (chemical enhancers and nanocarriers) and active techniques such as iontophoresis, electroporation, sonophoresis, and microneedles are used to enhance drug permeation.

Keywords: Dendrimer; Transdermal drug delivery; Nanocarriers; Liposomes; Microneedles; Permeation enhancement.

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APP ABSTRACT - APP 2026 - 137

A REVIEW OF ARTIFICIAL INTELLIGENCE-BASED RESEARCH ON CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Abstract

Chronic Obstructive Pulmonary Disease (COPD) has become a major focus of artificial intelligence (AI) research in respiratory medicine, driving innovations in diagnosis, disease management, and prognostic assessment. This review synthesizes recent AI-based studies on COPD, highlighting applications in medical imaging analysis, remote patient monitoring, and non-invasive diagnostic alternatives to traditional spirometry. AI algorithms are used to quantify emphysema, assess fissure integrity, detect bronchiectasis, and analyze pulmonary vessels from CT scans, enhancing radiologic evaluation. Wearable sensor data processed by AI enable continuous remote monitoring of COPD patients, facilitating early detection of exacerbations.

Novel AI tools also analyze respiratory sound attributes and voice features to diagnose COPD, exemplified by the smartphone app *Swaasa*, which achieves ≈90% accuracy in detecting COPD and tuberculosis from cough recordings. Another model, *AutoCOPD*, accurately identifies COPD using only 10 quantitative CT features, demonstrating the potential for streamlined imaging analysis. AI-driven predictive models forecast disease progression, exacerbation risk, and mortality, supporting personalized treatment plans and optimizing clinical decision-making.

The 2026 GOLD COPD Update emphasizes earlier and more precise diagnosis, positioning AI as a key enabler of this shift toward proactive, individualized care. Implementation challenges include ensuring data quality, model interpretability, and seamless integration into existing clinical workflows. Future research should focus on developing robust, validated AI systems to improve COPD management and patient outcomes globally.

Keywords: Chronic Obstructive Pulmonary Disease (COPD), artificial intelligence (AI), respiratory medicine, machine learning.

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Microneedle-Assisted Drug Delivery for Improved Bioavailability

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Abstract

Drug bioavailability is a critical factor that determines the therapeutic effectiveness of many pharmaceutical agents. Conventional drug delivery routes such as oral and parenteral administration often face limitations including poor absorption, enzymatic degradation in the gastrointestinal tract, and extensive first-pass metabolism in the liver. These challenges reduce the amount of active drug reaching systemic circulation.Microneedle-assisted drug delivery has emerged as an innovative transdermal approach designed to overcome these barriers and improve drug bioavailability.Microneedles are micron-sized needle structures that create temporary microchannels in the skin, enabling drugs to bypass the outermost barrier layer, the stratum corneum, without causing significant pain or tissue damage. This technology allows direct delivery of drugs into the epidermal or dermal layers, enhancing absorption and therapeutic efficiency.Various types of microneedles such as solid, coated, dissolving, and hollow microneedles have been developed to deliver a wide range of therapeutic agents including vaccines, peptides, proteins, and small-molecule drugs.Microneedle systems offer several advantages including painless administration, improved patient compliance, controlled drug release, reduced risk of infection, and minimal invasiveness compared to conventional injections. In addition, they provide a promising platform for targeted and sustained drug delivery. Due to these benefits, microneedle-based systems are gaining significant attention in modern pharmaceutical research and development.This review focuses on the principle, types, mechanism of drug delivery, and advantages of microneedle technology, highlighting its potential role in enhancing drug bioavailability and improving therapeutic outcomes.

Keywords: Microneedles, Transdermal Drug Delivery, Bioavailability, Skin Permeation, Drug Delivery Systems

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APP ABSTRACT - APP 2026 - 139

RISK OF HYPERKALEMIA ASSOCIATED WITH ACE INHIBITOR THERAPY IN CHRONIC KIDNEY DISEASE PATIENTS WITH RISK FACTORS, MANAGEMENT, AND FUTURE PERSPECTIVES

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Abstract

Angiotensin-Converting Enzyme (ACE) Inhibitors are commonly used to treat hypertension and slow progression of Chronic Kidney Disease. But diminished Aldosterone hormones lower kidney potassium secretion leading to a heightened chance of Hyperkalemia Especially individuals suffering from CKD. That may lead to lethal complications like cardiac arrhythmias, therefore requiring close monitoring and certain management approaches. Aim is to know the importance of hyperkalemia risk and some contributing factors with management strategies that help avoid potassium imbalance during treatment. A literature review of published articles and clinical data describing ACE inhibitor–induced hyperkalemia in patients with CKD; it assessed the risk factors, patient characteristics, drug treatment to better understand its occurrence. Results indicate previous CKD stages, DM and drugs contribute to increased Hyperkalemia risk. hypoaldosteronism causes reduced renal potassium excretion and elevated Aldosterone hormone leads hyperkalemia. Monitoring serum potassium and kidney function routinely can prevent life-threatening complications. Limitation depends on data and clinical reports based on published evidence instead of patient-based novel experimental analysis. Differences in study design, patient populations, and treatment protocols in reviewed sources might limit the generalisability of findings. Advanced monitoring strategies will predictive novel therapeutic approaches to reduce hyperkalemia occurance. Further developments in therapeutics like enhanced potassium-binding agents and novel replacement modalities Ensure advance patient safety. Regular screening of serum potassium levels and appropriate management strategies helps to balance the complications associated with inhibitor therapy.

Keywords: ACE Inhibitors, Chronic Kidney Disease, Hyperkalemia, Aldosterone, Serum Potassium Monitoring

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APP ABSTRACT - APP 2026 - 140

THE DIGITAL DIABETES PHARMACIST: A PROPOSED FRAMEWORK FOR DEDICATED CLINICAL PHARMACIST OVERSIGHT IN DIABETES DIGITAL TWIN SYSTEMS

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Abstract

Diabetes affects over 537 million people worldwide, and the system built to manage it is not working. It responds to crises after they occur, treats every patient identically regardless of their individual biology, and places over 180 clinical decisions per day on patients themselves without adequate professional support. It was never designed for precision. It was designed for scale.

Diabetes digital twin technology is beginning to offer something better. A digital twin is a continuously updated, patient-specific computational model that simulates in real time how an individual's liver, kidneys, gut, and insulin system interact, predicting where their glucose is heading four to six hours before it gets there. The output this technology produces is deeply pharmacological in nature. Yet no current care model assigns a clinician with pharmacological expertise to review it continuously.

This paper proposes the Digital Diabetes Pharmacist, a dedicated clinical pharmacist whose primary role is to review digital twin reports for a defined patient cohort daily, act on minor drug interventions independently, co-sign major therapeutic decisions with the physician, and escalate emergencies immediately. Every decision feeds back into the twin, making it progressively more accurate for that specific patient over time.

The physician's engagement with the patient is episodic by nature, which is incompatible with continuous twin oversight. The nurse manages observation and life variables, not drug variables, and existing research has already identified where that falls short. The pharmacist is the only clinician whose training is built around pharmacokinetics, drug interactions, and insulin dynamics, which is precisely the output the twin generates. Implementation barriers and a four-stage research agenda are examined in full. This framework has no precedent in the published literature.

Keywords: Digital twin, Clinical pharmacy practice, Diabetes management

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APP ABSTRACT - APP 2026 - 141

STIMULI-RESPONSIVE NANOCARRIERS: AN EMERGING STRATEGY FOR CONTROLLED AND TARGETED DRUG DELIVERY

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Abstract

Stimuli-responsive nanocarriers have emerged as an advanced approach in novel drug delivery systems aimed at achieving controlled and site-specific drug release. These intelligent nanocarriers are engineered to respond to specific internal or external stimuli such as variations in pH, temperature, enzymatic activity, light, or magnetic fields. Upon exposure to these stimuli, the nanocarrier undergoes structural or physicochemical changes that trigger the release of the encapsulated drug at the desired target site. Such targeted release improves therapeutic efficacy while minimizing systemic toxicity and adverse effects associated with conventional drug delivery. In addition, stimuli-responsive nanocarriers can enhance pharmacokinetic properties by protecting drugs from premature degradation, prolonging systemic circulation, and enabling more precise drug distribution. These systems have demonstrated promising applications in cancer therapy, inflammatory disorders, and other chronic diseases where targeted and controlled drug delivery is essential. Recent advances in nanotechnology have facilitated the development of multifunctional nanocarriers capable of responding to multiple stimuli, thereby further improving the precision and effectiveness of drug delivery. Overall, stimuli-responsive nanocarriers represent a promising innovation in pharmaceutical sciences with the potential to significantly enhance therapeutic outcomes and optimize modern pharmacotherapy.

Keywords: Stimuli-Responsive Nanocarriers, Controlled Drug Release, Targeted Drug Delivery, Nanotechnology, Novel Drug Delivery Systems

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APP ABSTRACT - APP 2026 - 142

PRECISION MEDICINE IN EPILEPSY: A GENDER-BASED OMICS APPROACH

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Abstract

Epilepsy is a complex neurological condition with recurrent seizures and is often accompanied by cognitive impairments and varying drug responses. The recent advances in precision medicine have highlighted the importance of proteomic and metabolomic biomarkers in understanding the heterogeneity of the condition as well as the gender-related differences in drug responses.Proteomic research has shown that there is differential expression of synaptic and receptor-related proteins such as the GABA_A subunits,NMDA receptor-associated proteins and synaptophysin, which are involved in the control of neuronal excitability,synaptic plasticity,memory. Variations in the expression of drug transporter proteins such as P-glycoprotein at the BBB have also been associated with reduced drug penetration and pharmacoresistance in epilepsy patients.Metabolomic profiling has revealed significant alterations in neurotransmitter and energy metabolism pathways, including changes in glutamate,GABA, and lactate levels, which may influence seizure threshold and cognitive function. In addition, inflammatory and neurotrophic biomarkers such as BDNF,interleukin-1β, and tumor necrosis factor-α show differential expression patterns that may vary with sex hormones, contributing to gender-specific differences in disease progression and drug response.Proteomic and metabolomic studies indicate gender differences in epilepsy caused by certain sex hormones such as estrogen, progesterone, testosterone, and a metabolite of progesterone named allopregnanolone. In females, estrogen increases NMDA receptor function and excitatory transmission, and progesterone/allopregnanolone increases GABA_A receptor function, resulting in hormone-dependent modulation of seizure threshold and cognitive function. In males, testosterone and its metabolites may modulate GABA_A and NMDA receptor function, resulting in distinct, though relatively stable, receptor function compared with females. In addition, gender differences in P-glycoprotein, a drug transporter involved in the BBB, might influence the penetration of antiepileptic drugs.. These results demonstrate the relevance of hormone-dependent mechanisms in epilepsy and support the need of gender specific precision therapy

Keywords: Epilepsy, Proteomics, Metabolomics, Biomarkers, GABA, BDNF, P-glycoprotein, Pharmacoresistance, Precision medicine, Personalized therapy.

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APP ABSTRACT - APP 2026 - 143

L-ARGININE THERAPY FOR PLACENTAL INSUFFICIENCY AND IMPAIRED FETAL PERFUSION :A PRECISION MEDICINE APPROACH INTEGRATING NITRIC OXIDE BIOMARKERS, MICROBIOME AND NUTRIGENOMICS DETERMINANTS

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Abstract

Normal pregnancy requires adequate uteroplacental blood flow, which is largely regulated by nitric oxide (NO) produced from L-arginine via nitric oxide synthase. Nitric oxide plays an essential role in vasodilation, regulation of vascular tone, maintenance of endothelial function, inhibition of platelet aggregation, and improvement of uteroplacental circulation, thereby ensuring sufficient oxygen and nutrient supply to the developing fetus. In certain pregnancy complications such as placental insufficiency, intrauterine growth restriction, and early endothelial dysfunction, nitric oxide bioavailability may decline, leading to impaired vascular relaxation and reduced fetal perfusion. Emerging evidence suggests that factors including maternal microbiome composition, nutrigenomic variations in arginine metabolism, hormonal changes, and metabolic stress may further influence nitric oxide synthesis during pregnancy. However, conventional nutritional supplementation strategies rarely consider these underlying determinants. This study proposes a personalized approach to L-arginine nutritional supplementation by identifying pregnancy-related factors that contribute to nitric oxide depletion and evaluating how targeted nutritional supplementation may improve maternal vascular function and fetal outcomes. Pregnant women presenting with risk indicators of impaired placental circulation will be evaluated for nitric oxide–related biomarkers, metabolic parameters, and nutritional status. Selected participants will receive oral L-arginine nutritional supplementation aimed at restoring nitric oxide production. Additional factors such as maternal microbiome balance, nutrigenomic influences on arginine metabolism, and hormonal profiles will be analyzed to determine their relationship with nitric oxide bioavailability. Maternal hemodynamic parameters and fetal growth indicators will be monitored to assess supplementation response. This approach highlights the potential of precision medicine in obstetric pharmacotherapy, where understanding individual biological factors influencing nitric oxide metabolism could optimize L-arginine therapy and improve maternal-fetal outcomes.

Keywords: L-arginine; Nitric oxide; Uteroplacental blood flow; Nutrigenomics; Maternal microbiome

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APP ABSTRACT - APP 2026 - 144

Nanotechnology Approaches to Overcome Blood–Brain Barrier in CNS Drug Delivery

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Abstract;The blood–brain barrier (BBB) remains one of the most formidable challenges in central nervous system (CNS) drug delivery, restricting the passage of approximately 98% of small-molecule drugs and nearly all large-molecule therapeutics. This review examines emerging nanotechnology-based strategies developed to overcome BBB limitations and enhance CNS drug bioavailability. Various nanocarrier systems — including polymeric nanoparticles, liposomes, solid lipid nanoparticles, dendrimers, carbon nanotubes, and exosomes — have demonstrated significant promise in facilitating drug transport across the BBB through mechanisms such as adsorptive-mediated transcytosis, receptor-mediated transcytosis, and transient barrier disruption. Surface functionalization with targeting ligands, including transferrin, lactoferrin, and apolipoprotein E, has further improved site-specific delivery efficiency. Additionally, stimuli-responsive nanocarriers activated by pH, temperature, or external stimuli such as focused ultrasound and magnetic fields offer dynamic control over drug release kinetics within the CNS. Despite substantial preclinical progress, translational challenges persist, including nanotoxicity, scalability, immunogenicity, and regulatory hurdles. This review critically evaluates current advances, mechanistic pathways, and the future outlook of nanomedicine in CNS therapeutics, underscoring the transformative potential of nanotechnology in treating neurological disorders such as Alzheimer's disease, Parkinson's disease, glioblastoma, and multiple sclerosis.

Keywords: Blood–brain barrier (BBB) · CNS drug delivery · Nanotechnology · Nanoparticles · Liposomes · Polymeric nanocarriers · Solid lipid nanoparticles · Dendrimers · Receptor-mediated transcytosis · Adsorptive-mediated

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APP ABSTRACT - APP 2026 - 145

NANO-ANTIBIOTICS: A NEW STRATEGY TO FIGHT ANTIBIOTICS RESISTANCE

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Abstract

Antibiotic resistance has emerged as one of the most critical global health threats of the 21st century, rendering conventional antimicrobial therapies increasingly ineffective against multidrug-resistant (MDR) pathogens. The rise of "superbugs" such as methicillin-resistant Staphylococcus aureus (MRSA), carbapenem-resistant Enterobacteriaceae (CRE), and extensively drug-resistant Mycobacterium tuberculosis demands urgent development of innovative therapeutic strategies.

Nanoparticles, including liposomes, polymeric nanoparticles, silver nanoparticles, zinc oxide nanoparticles, and dendrimers, offer unique physicochemical properties that enhance antimicrobial efficacy through multiple mechanisms. These include targeted drug delivery, improved cellular penetration, disruption of bacterial biofilms, and the ability to bypass conventional resistance pathways such as efflux pumps and enzymatic drug degradation. By encapsulating antibiotics within nanocarriers, therapeutic concentrations can be achieved at infection sites while minimizing systemic toxicity and off-target effects.

Furthermore, nano-antibiotics demonstrate synergistic activity when combined with existing antibiotics, potentially restoring the efficacy of drugs rendered obsolete by resistance. Surface functionalization of nanoparticles enables pathogen-specific targeting, reducing the ecological burden of broad-spectrum antibiotic use and the consequent selective pressure that drives resistance.

Despite promising preclinical outcomes, challenges including nanotoxicity, scalability, regulatory approval, and long-term safety require rigorous investigation. Nonetheless, nano-antibiotics represent a compelling frontier in combating antimicrobial resistance, offering renewed hope for effective infection management in a post-antibiotic era.

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APP ABSTRACT - APP 2026 - 146

STUDY THE EFFECT OF POLYMERS ON GASTRO RETENTIVE FLOATING MICROSPHERES OF DIACEREIN

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Abstract

The research work was mainly focused on the formulation development and evaluation of floating microspheres of Diacerein as to retain the formulation for a prolonged period of time and deliver the drug to the site of absorption. The microspheres were prepared by non-aqueous solvent evaporation method using polymer such as different concentrations of ethyl cellulose and HPMC K4M, in different ratios and Pravastatin in each formulation. The prepared microspheres were characterized by polymer compatibility (FTIR), The FTIR spectra of drug and different polymers showed no shift in peak, hence no interaction. Micromeritic properties such as Bulk density, Tapped density, Carr's index and Angle of repose. Other properties including percentage of floating buoyancy, drug entrapment efficiency, percentage of yield, *in vitro* drug release and SEM studies. The prepared floating microspheres were found to produce the percentage of yield was in the range of 82.7 - 98.5 %, drug entrapment efficiency was 68 %-98.9 %, percentage of floating buoyancy was 70.2 - 80.6 % and *in vitro* drug release was 94.67 % per 12hrs. Scanning electron microscopy (SEM) confirmed their spherical size, perforated smooth surface and a hollow cavity in them. The best drug release, entrapment efficiency and percentage of floating buoyancy profiles were seen with formulation F10 at the ratio of drug to polymer (HPMC K4M) of 1:5.

Keywords: Diacerein, Ethyl cellulose, Floating buoyancy, Floating Microspheres, Hydroxy Propyl Methyl Cellulose, *In vitro* drug release studies.

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APP ABSTRACT - APP 2026 - 147

RP-HPLC METHOD DEVELOPMENT AND VALIDATION OF DASATINIB AND PYRIDOXINE HYDROCHLORIDE IN THEIR COMBINED TABLET DOSAGE FORM

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Abstract

Methodology consists of the general principle in HPLC instrumentation protocol for method development and the detail about the proposed RP-HPLC method on the drug is included. Where the RP-HPLC method in which determination of Dasatinib and Pyridaxine HCl was carried out on a Symmetry C18 (4.6 x 150mm, 5⌈m, Make: Waters) using a mobile phase consisting of pH 3.5 phospate buffer: Acetonitrile (30:70). The mobile phase was pumped at a rate of 1.0 ml/min and the detection was carried out at 254nm. The retention time of Dasatinib and Pyridaxine HCl was found to be 2.162 and 3.305 min respectively and linearity was in the range of 12-60µg / ml for Pyridaxine HCl and 20-100µg / ml for Dasatinib. The results obtained in newer RP-HPLC method for determination of Dasatinib and Pyridaxine HCl are tabulated and also discussed about the developed RP-HPLC method. The proposed method is simple cost effective and gives reliable assay results with short analysis time (5min).The content of drugs in the formulation was found to be 60mg Pyridaxine HCl and 100mg Dasatinib. The method was validated in terms of sensitivity, accuracy and precision and can be used for the routine determination of Dasatinib and Pyridaxine HCl in pharmaceutical formulations. The above method does not suffer from any interference due to common excipients. Therefore the proposed RP-HPLC method could be successfully applied to estimate commercial pharmaceutical products containing Dasatinib and Pyridaxine HCl.

Keywords: Symmetry C18, Dasatinib and Pyridaxine, RP-HPLC

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APP ABSTRACT - APP 2026 - 148

DEGRADATION STUDY OF EXPIRED DRUG AND EXTANT PROPRANOLOL FORMULATION BY UV VISIBLE SPECTROSCOPY

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Abstract

Hypertension is a major health problem throughout the world because of its high prevalence and its association with increased risk of cardiovascular disease. The ultimate goal in treatment of the hypertensive patient is to achieve the maximum reduction in the long-term total risk of cardiovascular mobility and mortality. Antihypertensive drugs are used to treat high blood pressure. Propranolol is a non-cardio selective β-blocker used for the treatment of hyper- tension, pheochromocytoma, angina pectoris, myocardial infarction, and cardiac arrhythmias. Forced degradation studies are also known as stress testing, stress studies, stress decomposition studies, forced decomposition studies, etc. The present study involves the comparison of forced degradation studies such as acid and alkali hydrolytic degradation of Propranolol in their standard drug, extant and expired dosage forms. Propranolol was soluble in water so λmax of drug was identified by measuring UV-Visible spectrum in the range of 800-200 nm in distilled water and it was found to be 291 nm. Calibration curve of drug plotted in the obtained λ max and the curves found to be linear in the selected concentration range 5-25 µg/mI. Percentage purity of extant and expired drugs was calculated. Forced degradation of drug was performed by using 0.1M HCl and 0.1M NaOH. Degraded sample were quantified by UV-Visible spectroscopic method and the percentage degradation was calculated. In all the methods used in degradation study, expired dosage form undergoes greater degradation when compared with that of extant and standard drug. For Propranolol, it undergoes more degradation in NaOH when compared to HCl.

Keywords: UV-Visible spectroscopy, Propranolol, extant, expired & forced degradation

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APP ABSTRACT - APP 2026 - 149

ANTIBIOTIC USE IN PREGNANCY AND LACTATION- REVIEW ARTICLE

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Abstract

This study aims to evaluate antibiotic utilization patterns in pregnant and lactating women and to assess their impact on maternal and fetal health outcomes. This study will incorporate both quantitative and qualitative data analysis derived from clinical databases, prescription records, and structured interviews with healthcare providers as well as pregnant and lactating women. In addition, the study seeks to classify commonly prescribed antibiotics according to their safety profiles and trimester-specific risks, and to evaluate adherence to established clinical guidelines. It will also assess factors influencing prescribing practices, including physician knowledge, patient awareness, and healthcare accessibility. Furthermore, this research will examine the short- and long-term maternal and neonatal outcomes associated with antibiotic exposure, including potential adverse drug reactions, antimicrobial resistance patterns, and effects on neonatal microbiota. Special attention will be given to identifying high-risk drug categories and inappropriate prescriptions. The findings are expected to support the development of evidence-based strategies to optimize antibiotic prescribing during pregnancy and lactation, thereby improving maternal and fetal health outcomes and promoting rational drug use.

Keywords: Antibiotic utilization, pregnancy and lactation, maternal and fetal outcomes, prescribing practices, antimicrobial resistance

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APP ABSTRACT - APP 2026 - 150

ADVANCING GREEN ANALYTICAL CHEMISTRY: LC–MS/MS METHOD DEVELOPMENT FOR ULTRA-TRACE NITROSAMINE AND GENOTOXIC IMPURITY CONTROL

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Abstract

Nitrosamines/GTIs challenge pharmaceutical safety at trace levels. This study develops/validates a green LC–MS/MS method for ultra-trace detection/quantification of selected nitrosamines/GTIs, emphasizing reduced solvent use, eco-friendly phases, and simplified preparation. Short C18 column with gradient elution achieved separation; MRM mode ensured sensitivity/selectivity. Linearity spanned low-ppb range; LOD/LOQ beat regulatory limits. Validation confirmed accuracy, precision, specificity, robustness. It merges green chemistry with compliance for routine monitoring. Green preparation minimized handling/solvents: weigh/dissolve/filter drug substances/dosage forms; use certified standards. Employed HPLC water, judicious ethanol/acetonitrile, ammonium formate/acetate buffers. LC–MS/MS with short C18 column, aqueous buffer + low organic modifier under optimized gradient for short runtime. Outperforms conventional methods by slashing solvent use, time, and waste; MS-compatible low-toxicity solvents sustain analysis without performance loss.

Keywords: Green analytical chemistry; LC–MS/MS; Nitrosamines; Genotoxic impurities; Pharmaceutical analysis.

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APP ABSTRACT - APP 2026 - 151

A REVIEW ON THE ROLE OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN OPHTHALMOLOGY

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Abstract

The integration of Artificial Intelligence (AI) and Machine Learning (ML) into ophthalmology has quickly changed how eye care diagnostics and disease management work. Ophthalmology is mostly an image-based field, making it a great fit for using deep learning algorithms, especially convolutional neural networks (CNNs), for automated image analysis. This review looks at how AI and ML play a growing role in the early detection, diagnosis, screening, and monitoring of major eye diseases. These include diabetic retinopathy (DR), glaucoma, age-related macular degeneration (AMD), and retinopathy of prematurity (ROP). AI-driven systems have shown diagnostic accuracies that match, and in some cases surpass, those of expert ophthalmologists in interpreting retinal images. Moreover, AI applications go beyond retinal disorders to include diseases of the anterior segment, detection of refractive errors, and tele-ophthalmology screening programs, which help improve access in areas with limited resources. The review also covers the methods behind AI models, including supervised learning, unsupervised learning, deep learning frameworks, and the need for large annotated datasets. Additionally, it examines new concepts like explainable AI (XAI), federated learning for data privacy, and the importance of validating findings in real-world clinical settings. Despite major progress, there are still challenges regarding data standardization, algorithm bias, regulatory approval, ethical issues, and how to fit these tools into everyday clinical practice. In conclusion, AI and ML are set to become essential tools in ophthalmology. They can improve diagnostic accuracy, lessen the workload for clinicians, and increase access to quality eye care worldwide. Future research should focus on clear model development, validation studies across multiple centers, and fair deployment to guarantee safe and effective clinical use.

Keywords: Artificial Intelligence; Machine Learning; Deep Learning; Ophthalmology; Diabetic Retinopathy; Glaucoma; Age-related Macular Degeneration; Retinal Imaging.

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APP ABSTRACT - APP 2026 - 152

ABSTRACT

NANO-SHIELDS FOR VISION: CERIUM OXIDE IN OCULAR THERAPY

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Abstract

Vision-threatening ocular disorders such as Age-related macular degeneration, Diabetic retinopathy, and Glaucoma are strongly associated with oxidative stress caused by excessive Reactive Oxygen Species (ROS). Conventional antioxidant therapies provide limited benefits due to poor bioavailability and rapid depletion. In this context, cerium oxide nanoparticles (CeO_2 NPs), also known as nanoceria, have emerged as a promising redox-active nanotherapeutic agent for ophthalmic applications.

Nanoceria exhibits a unique ability to switch between Ce^{3+} and Ce^{4+} oxidation states, enabling continuous scavenging of ROS and mimicking natural antioxidant enzymes such as superoxide dismutase and catalase. This regenerative antioxidant property allows them to function as "nano-shields," providing prolonged protection against oxidative damage in ocular tissues.

Preclinical studies have demonstrated that nanoceria protect retinal photoreceptor cells, reduce inflammation, and inhibit vascular damage. To date, various pharmaceutical formulations have been developed to enhance their clinical applicability, including water-soluble nanoceria, glycol chitosan-coated cerium oxide nanoparticles (GCCNPs), and alginate–gelatin hydrogel-loaded GCCNPs. These advanced formulations improve stability, biocompatibility, and targeted delivery, while also enabling sustained drug release. Additionally, strategies such as PEGylation and liposomal encapsulation further enhance corneal permeation without altering their physicochemical properties.

Despite their significant advantages, challenges such as long-term safety, large-scale production, and regulatory approval remain. Future research focusing on clinical translation and optimized delivery systems is essential.

In conclusion, nanoceria represents a transformative approach in ocular therapy by offering continuous antioxidant protection, with the potential to prevent vision loss and improve patient outcomes.

Keywords: cerium oxide, selective oxygen species, GCCNPs, ocular disorders, anti-oxidant therapies.

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APP ABSTRACT - APP 2026 - 153

ROLE OF ARTIFICIAL INTELLIGENCE IN STRENGTHENING REGULATORY INSPECTIONS: A PHARMACOVIGILANCE PERSPECTIVE

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Abstract

Regulatory inspections in pharmacovigilance are essential to ensure drug safety, compliance with Good Pharmacovigilance Practices (GVP), and protection of public health. However, traditional inspection models are resource-intensive, retrospective, and often limited by manual data review processes. Artificial Intelligence (AI) offers a transformative approach to strengthening regulatory inspections through automation, predictive analytics, and intelligent risk-based assessment. Machine learning algorithms can analyze large volumes of Individual Case Safety Reports (ICSRs), detect reporting inconsistencies, and identify compliance gaps in real time. Natural Language Processing (NLP) enables automated review of narrative safety reports, improving data quality and MedDRA coding accuracy. AI-driven risk scoring systems assist regulators in prioritizing high-risk marketing authorization holders for targeted inspections. Furthermore, anomaly detection models can identify patterns suggestive of under-reporting, delayed submissions, or data manipulation. Integration of AI with regulatory databases enhances transparency, inspection readiness, and proactive signal detection. By shifting from reactive to predictive oversight, AI strengthens inspection efficiency, reduces regulatory burden, and supports evidence-based decision-making. The incorporation of AI into pharmacovigilance regulatory frameworks represents a forward-looking strategy to enhance global drug safety monitoring and ensure continuous compliance in an increasingly data-driven healthcare environment.

Keywords: Artificial Intelligence; Regulatory Inspection; Pharmacovigilance; Risk-Based Assessment; Signal Detection.

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APP ABSTRACT - APP 2026 - 154

NOVEL CARRIER SYSTEMS AS VACCINE ADJUVANTS: PHARMACEUTICAL DEVELOPMENT AND CHARACTERIZATION.

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Abstract

The development of effective and safe vaccines often relies on the use of adjuvants to enhance immunogenicity and ensure long-lasting immune responses. In recent years, novel carrier systems have emerged as promising vaccine adjuvants due to their ability to improve antigen stability, targeted delivery, and controlled release. This study focuses on the pharmaceutical development and characterization of advanced carrier-based adjuvant systems, including liposomes, niosomes, polymeric nanoparticles, solid lipid nanoparticles, and nanoemulsions.

These carrier systems were designed to encapsulate or adsorb antigens, thereby protecting them from degradation and facilitating efficient uptake by antigen-presenting cells. Various formulation parameters such as particle size, surface charge, encapsulation efficiency, and release kinetics were optimized to achieve enhanced immunological performance. The prepared formulations were characterized using techniques including dynamic light scattering, zeta potential analysis, electron microscopy, and in vitro release studies.

Furthermore, the immunostimulatory potential of these systems was evaluated through in vitro and in vivo studies, demonstrating improved antigen presentation, activation of immune cells, and enhanced humoral and cellular immune responses compared to conventional adjuvants. Stability studies confirmed that these carrier systems maintain structural integrity and antigen potency under different storage conditions.

Overall, novel carrier-based adjuvants represent a versatile and efficient platform for next-generation vaccine delivery. Their ability to enhance immune responses while minimizing toxicity makes them highly suitable for modern vaccination strategies. This study highlights their potential to address current challenges in vaccine development and improve prophylactic and therapeutic outcomes.

Keywords: Vaccine adjuvants, Novel carrier systems, Liposomes, Polymeric nanoparticles, Nanoemulsions, Antigen delivery, Immunogenicity, Controlled release, Drug delivery systems, Pharmaceutical characterization

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APP ABSTRACT - APP 2026 - 155

DIGIT AL PILLS: IMPACT OF RISING TECHNOLOGY

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Abstract

Digital Pills (DP) are an innovative drug-device technology that permits to combine traditional medications with a monitoring system to record data about medication adherence as well as patients' physiological data without human intervention. The Digital Medicine System (DMS), a drug–device combination developed for patients with serious mental illness, together combines adherence measurement with pharmacologic action by placing an ingestible sensor in a pill, allowing for information sharing among patients, Health Care Providers (HCPs), and caregivers via a mobile interface. Non-adherence to medication compromises the helpfulness of psychiatric treatments in patients with Serious Mental Illness (SMI). The combination of wearable technology with a "Digital Ingestion Tracking Program" (DITP) embedded within a pain pill may allow patients, caregivers as well as healthcare providers to track ingestion of pills through the web or a Smartphone app. Digital adherence technology could be promising patient-centered strategies for monitoring adherence. In November 2017, the Food and Drug Administration (FDA) approved a version of a second-generation antipsychotic, aripiprazole; embedded with a sensor (Ability MyCite). The paper highlights the impact of DMS and provides detailed review about it.

Keywords: Digital pills, Digital medicine, Mobile health & Monitoring devices

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APP ABSTRACT - APP 2026 - 156

NANOGELS: A SMART AND VERSATILE PLATFORM FOR CONTROLLED AND TARGETED DRUG DELIVERY

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Abstract

Nanogels have emerged as a promising and advanced platform in the field of drug delivery due to their unique physicochemical and biological properties. They are nanosized, three-dimensional cross-linked polymeric hydrogel systems capable of encapsulating a wide range of therapeutic agents, including small molecules, proteins, and nucleic acids. Their high water content, tunable size, and large surface area enable efficient drug loading and controlled release. Nanogels overcome the limitations of conventional drug delivery systems such as poor stability, low bioavailability, and non-specific targeting by providing improved biocompatibility, biodegradability, and prolonged circulation time.

Furthermore, nanogels exhibit stimuli-responsive behavior (pH, temperature, light, and redox conditions), allowing site-specific and controlled drug release, thereby enhancing therapeutic efficacy while minimizing adverse effects. Their small size (typically 20–200 nm) facilitates penetration across biological barriers, including the blood–brain barrier, making them highly suitable for targeted delivery in complex diseases such as cancer and neurological disorders.

Different synthesis methods, including physical and chemical cross-linking techniques, enable the design of nanogels with tailored properties for specific biomedical applications. Additionally, their ability to encapsulate both hydrophilic and hydrophobic drugs, along with multiple bioactive agents, highlights their versatility. Despite their significant advantages, challenges such as scalability, stability, and clinical translation remain to be addressed. Overall, nanogels represent a next-generation drug delivery system with immense potential to revolutionize modern therapeutics and nanomedicine.

Keywords: Nanogels; Drug delivery system**;** Controlled drug release**;** Targeted delivery**;** Biocompatibility**;** Stimuli-responsive systems**;** Nanocarriers; Nanomedicine

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APP ABSTRACT - APP 2026 - 157

PHARMACOVIGILANCE STRATEGIES FOR MONITORING ADVERSE EFFECTS OF NANOMEDICINES

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Abstract

Nanomedicine is a new field of pharmaceutical sciences that incorporates nanotechnology into drug delivery systems like liposomes, nanoparticles, dendrimers, and solid lipid nanoparticles. Nanoparticles have specific physicochemical properties like small particle size, large surface area, and high reactivity. Nanoparticles may affect the pharmacokinetic and biodistribution profiles of drugs. Nanoparticles may produce nano-specific adverse effects like immune system activation, oxidative stress, hypersensitivity, and organ accumulation, especially in organs like the liver and spleen.

The conventional pharmacovigilance systems that are designed to monitor traditional drugs may not be able to effectively monitor safety concerns associated with nanomedicines because of differences in their composition, size, and charge. Advanced pharmacovigilance approaches, such as specific adverse reaction reporting of nanomedicines, post-marketing surveillance, and the generation of real-world evidence, and using advanced analytical tools to study nanoparticle biodistribution and toxicity, are necessary.

Finally, it is essential to conclude that strengthening pharmacovigilance with better reporting systems, evaluation methods, and regulatory harmonization is vital to ensure safe clinical use of nanomedicines while further advancing nanotechnology-based drug development.

Keywords: Nanomedicine, Pharmacovigilance, Adverse Drug Reactions, Drug Safety Monitoring,Nanotoxicity.

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APP ABSTRACT - APP 2026 - 158

PHARMACOGNOSTIC PROFILING AND BIOACTIVITY EVALUATION OF *MANGIFERA INDICA* INFLORESCENCE FOR ANTIOXIDANT AND ANTIDIABETIC POTENTIAL

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Abstract

The inflorescence of Mangifera indica has been traditionally used in herbal medicine for the management of metabolic disorders. The present study aimed to evaluate the pharmacognostic features, phytochemical constituents, and bioactive potential of *Mangifera indica* inflorescence with emphasis on antioxidant and antidiabetic activities.

The plant material collected from Kerala, India was authenticated and subjected to pharmacognostic evaluation including macroscopic analysis, powder microscopy, and proximate analysis to establish diagnostic characters. Preliminary phytochemical screening was carried out to identify major secondary metabolites. Successive extraction of the powdered material was performed using petroleum ether, chloroform, ethanol, and water.

The antioxidant activity of the extracts was assessed using DPPH radical scavenging and ferric ion reducing power assays, while antidiabetic potential was evaluated through α-amylase and α-glucosidase inhibition assays. Among the extracts, the ethanolic extract exhibited the highest antioxidant activity and significant inhibition of carbohydrate-digesting enzymes. Further in vivo evaluation in diabetic rat models demonstrated reduction in blood glucose levels and improvement in lipid profiles, along with protective histopathological changes in pancreatic and hepatic tissues.

These findings suggest that *Mangifera indica* inflorescence possesses promising antioxidant and antidiabetic properties and may serve as a potential natural therapeutic source for managing diabetes and oxidative stress.

Keywords: Mangifera indica inflorescence, pharmacognostic evaluation, phytochemical screening, antioxidant activity,

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APP ABSTRACT - APP 2026 - 159

ROLE OF NANOTECHNOLOGY IN TARGETED ANTIMICROBIAL DRUG DELIVERY

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Abstract

Infectious diseases remain a major global health challenge, and the effectiveness of conventional antimicrobial therapy is often limited by poor drug penetration, systemic toxicity, and the development of antimicrobial resistance. Nanotechnology has emerged as a promising approach to overcome these limitations by enabling targeted antimicrobial drug delivery. Nanocarriers such as liposomes, polymeric nanoparticles, dendrimers, solid lipid nanoparticles, and nano emulsions can encapsulate antimicrobial agents and deliver them directly to the site of infection. These nano systems enhance drug solubility, stability, and bioavailability while improving drug penetration into infected tissues and microbial biofilms. Targeted delivery also reduces systemic side effects and minimizes the required drug dosage. In addition, nanotechnology-based systems can provide controlled and sustained drug release, which improves therapeutic outcomes and helps combat antimicrobial resistance. Recent advances in nanomedicine have also enabled the development of multifunctional nanoparticles that combine antimicrobial activity with diagnostic capabilities. Thus, nanotechnology offers innovative strategies for improving the efficacy and safety of antimicrobial therapy. The integration of nanotechnology into antimicrobial drug delivery systems holds significant potential for the future management of infectious diseases.

Keywords: Nanotechnology, Antimicrobial drug delivery, Nanoparticles, Targeted therapy, Drug resistance, Nanomedicine.

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APP ABSTRACT - APP 2026 - 160

Nanotechnology Applications in Vaccine Delivery Systems Abstract Introduction: Vaccine delivery plays a crucial role in achieving effective immune responses.

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Abstract

Traditional vaccine systems sometimes face challenges such as poor stability, limited targeting ability, and reduced immunogenicity. Nanotechnology has emerged as a promising approach to improve vaccine delivery and enhance immunological outcomes. Background: Nanotechnology-based delivery systems such as nanoparticles, liposomes, and nano emulsions
provide improved antigen protection, controlled release, and targeted delivery to immune cells. These nanoscale carriers can enhance antigen presentation and stimulate both humoral and cellular immune responses, making them valuable in modern vaccine development. Methods: This study reviews recent scientific literature on nanotechnology-based vaccine delivery systems. Various nanocarriers including polymeric nanoparticles, lipid nanoparticles, and virus-like nanoparticles were analysed for their formulation methods, delivery mechanisms, and immunological effectiveness. Results: Findings indicate that nanotechnology significantly improves vaccine stability, antigen protection, and targeted delivery to antigen-presenting cells. Nanoparticle-based systems also enhance immune activation, reduce required antigen doses, and allow controlled release of vaccine components. Several nano-based vaccines have demonstrated improved efficacy and safety in preclinical and clinical studies. Conclusion: Nanotechnology offers a powerful platform for improving vaccine delivery systems. By enhancing antigen stability, targeting efficiency, and immune response, nano-based delivery systems have the potential to revolutionize future vaccine development and improve global immunization strategies.

Keywords: Nanotechnology, Vaccine delivery systems, Nanoparticles, Lipid nanoparticles, Immunization, Targeted drug delivery.

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APP ABSTRACT - APP 2026 - 161

PREDICT BEFORE IT HAPPENS: DIGITAL TWIN TECHNOLOGY IN MODERN STROKE CARE

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Abstract

Stroke remains a leading cause of mortality and long-term disability worldwide, and timely diagnosis and treatment are critical for improving outcomes. Recent advances in artificial intelligence and computational modeling have introduced digital twin technology, which creates a dynamic virtual representation of a patient by integrating clinical data, neuroimaging, physiological parameters, and real time health records. The virtual model allows clinicians to stimulate disease progression, assess stroke risk, and evaluate potential therapeutic strategies in a digital environment before applying them to a patient.

In stroke care, digital twins combine multimodal datasets -including CT or MRI imaging, hemodynamic measurements, and patient-specific clinical factors- to model cerebral circulation and predict ischemic progression. Such predictive models support early identification of high-risk individuals, optimize treatment selection such as thrombolysis or endovascular therapy, and enable personalized clinical decision making. By continuously updating with patient data, digital twin can also monitor treatment responses and forecast clinical outcomes.

Recent studies evaluating aeromedical stroke retrieval programs highlight significant challenges in prehospital stroke management, including long transfer distances, delayed diagnosis, and limited imaging availability at remote retrieval sites. When integrated with predictive digital twin system, these platforms may further enhance early stroke diagnosis and timely intervention.

Overall, digital twin technology represents a promising step towards predictive, personalized, and date driven stroke management, potentially improving patient outcomes and transforming the future of stroke care.

Keywords:: Digital twins, Stroke prediction, Artificial intelligence, Precision Medicine, Personalized stroke care, Predictive analysis

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APP ABSTRACT - APP 2026 - 162

NANOTECHNOLOGY-BASED STRATEGIES FOR REVERSING LIVER FIBROSIS

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Abstract

Liver fibrosis is a progressive pathological condition characterized by excessive accumulation of extracellular matrix proteins, particularly collagen, resulting from chronic liver injury. Major causes include metabolic disorders, viral infections such as Hepatitis B and Hepatitis C, as well as metabolic conditions like Non-Alcoholic Fatty Liver Disease. Persistent liver injury leads to the activation of hepatic stellate cells, which play a crucial role in fibrogenesis by producing large amounts of collagen and other fibrotic components. Over time, continuous fibrotic deposition disrupts normal liver architecture and may progress to severe complications such as Cirrhosis and liver failure if left untreated.

Recent advances in Nanomedicine have introduced promising therapeutic strategies for targeted treatment and potential reversal of liver fibrosis. Nanoparticle-based drug delivery systems enable precise targeting of fibrotic liver tissue and activated hepatic stellate cells. Various nanoparticles, including lipid-based, polymeric, and inorganic nanoparticles, are being explored for their ability to transport anti-fibrotic drugs, antioxidants, and anti-inflammatory agents directly to the site of liver injury. This targeted delivery enhances therapeutic efficacy while minimizing systemic toxicity and side effects. In addition, nanoparticles can provide controlled and sustained release of therapeutic agents, improving drug stability and bioavailability. These nanocarriers can reduce oxidative stress, suppress inflammatory responses, and inhibit the activation of hepatic stellate cells, thereby limiting excessive collagen deposition and promoting the restoration of normal liver structure. Furthermore, nanoparticle-mediated delivery of protective compounds may support hepatocyte regeneration and tissue repair. Overall, nanotechnology represents a novel and promising approach for the management and potential reversal of liver fibrosis. Continued research in nanoparticle-based therapies may lead to the development of more effective and safer treatment strategies for chronic liver diseases.

Keywords: Liver Fibrosis, Nanomedicine, Targeted Drug Delivery, Hepatic Stellate Cells, Nanoparticle Therapy

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APP ABSTRACT - APP 2026 - 163

AI-Based Risk Prediction Model For Early Detection Of Ischemic Stroke In Hypertensive Patients

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Abstract

Ischemic stroke remains one of the most serious neurological emergencies worldwide and is a leading cause of long-term disability. Persistent hypertension significantly increases the risk of stroke by causing progressive damage to blood vessels supplying the brain. Despite regular monitoring, many high-risk individuals are not identified early enough using conventional risk scoring systems. Artificial Intelligence (AI) offers a promising approach to analyze complex clinical data and detect early warning patterns that may otherwise go unnoticed To design and evaluate an AI-based predictive model that can estimate the future risk of ischemic stroke among patients diagnosed with hypertension.

A retrospective observational study was conducted using clinical data from hypertensive patients aged between 40 and 75 years. Parameters such as systolic and diastolic blood pressure, lipid profile, blood glucose levels, body mass index, smoking history, medication adherence, and associated comorbidities were included. Machine learning algorithms were applied to identify patterns and generate individualized stroke risk predictions. Model performance was evaluated using accuracy, sensitivity, and specificity measures. The AI model demonstrated high predictive performance in identifying patients at elevated risk. Uncontrolled systolic blood pressure, diabetes, dyslipidemia, and poor medication adherence emerged as major contributing factors. Compared to traditional assess ment methods, the AI-based system showed improved ability to stratify patients according to risk severity.

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APP ABSTRACT - APP 2026 - 164

ROLE OF ARTIFICIAL INTELLIGENCE IN DRUG DISCOVERY FOR ALZHEIMER'S DISEASE

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Abstract

Alzheimer's disease is a progressive neurodegenerative disorder characterized by memory loss, cognitive impairment, and behavioural changes. It is one of the most common causes of dementia among the elderly population worldwide. Despite extensive research, the development of effective therapies for Alzheimer's disease remains challenging due to the complex nature of the disease and the limitations of currently available treatments such as Donepezil and Memantine, which mainly provide symptomatic relief rather than disease modification. Artificial Intelligence (AI) has emerged as a promising tool in modern pharmaceutical research, offering new strategies to accelerate drug discovery and development. The objective of this review is to explore how AI techniques can support the identification and development of potential therapeutic agents for Alzheimer's disease. A narrative literature review was conducted using scientific databases such as PubMed, Google Scholar, and ScienceDirect to collect relevant research articles focusing on AI applications in Alzheimer's drug discovery. Recent studies indicate that AI approaches, including machine learning and deep learning algorithms, can analyze large biological and chemical datasets to identify potential drug targets and predict drug–target interactions. AI-based virtual screening methods can also rapidly evaluate thousands of chemical compounds to identify promising candidates for further development. Additionally, AI technologies assist in drug repurposing by identifying existing drugs that may have potential therapeutic effects against Alzheimer's disease. In conclusion, artificial intelligence has the potential to significantly enhance the efficiency of drug discovery for Alzheimer's disease by reducing research time, improving prediction accuracy, and identifying novel therapeutic candidates. The integration of AI with traditional pharmaceutical research approaches may contribute to the development of more effective treatments for Alzheimer's disease in the future.

Keywords: Artificial Intelligence, Alzheimer's Disease, Drug Discovery

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APP ABSTRACT - APP 2026 - 165

RENAL SAFETY AND FUNCTIONAL STABILITY OF TORSEMIDE IN PATIENTS WITH CHRONIC KIDNEY DISEASE AND HEART FAILURE: A COMPREHENSIVE REVIEW

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Abstract

Loop diuretics are widely used in clinical practice for the management of fluid overload associated with chronic kidney disease (CKD), congestive heart failure, and liver cirrhosis. These drugs act primarily by inhibiting sodium and chloride reabsorption in the thick ascending limb of the loop of Henle, thereby promoting diuresis and reducing extracellular fluid volume. Among the available loop diuretics, torsemide and furosemide are the most frequently prescribed agents. Although both medications belong to the same pharmacological class, they differ significantly in terms of pharmacokinetics, bioavailability, duration of action, and clinical outcomes.

Despite these proposed benefits, there remains limited prospective clinical evidence evaluating the specific effects of torsemide on renal function parameters such as glomerular filtration rate (GFR), serum creatinine, and blood urea nitrogen (BUN). Many existing studies focus primarily on cardiovascular outcomes rather than renal endpoints. Therefore, further clinical research is necessary to evaluate the renal safety and functional stability associated with torsemide therapy in patients with CKD and heart failure.

This review article aims to summarize the current evidence regarding torsemide therapy and its impact on renal function in patients with CKD and heart failure. It also outlines a prospective interventional study designed to evaluate the effect of torsemide on renal function parameters including GFR, serum creatinine, and BUN. The study will also assess renal safety outcomes such as acute kidney injury and electrolyte disturbances. Overall, this review highlights the potential role of torsemide as a safe and effective loop diuretic that may help maintain stable renal function while effectively managing fluid overload in patients with cardiovascular and renal disorders.

Keywords: Loop Diuretics, Torsemide, Furosemide, Chronic Kidney Disease, Renal Function

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APP ABSTRACT - APP 2026 - 166

FECAL MICROBIOTA TRANSPLANTATION FOR DECOLONIZATION OF MULTIDRUG-RESISTANT ORGANISMS:AN EMERGING STRATEGY AGAINST ANTIMICROBIAL RESISTANCE

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Abstract

Antimicrobial resistance has traditionally been confronted with escalating pharmacologic force, yet the gut, which is a primary ecological reservoir of multidrug-resistant organisms (MDROs) has remained an underexploited therapeutic target. Conventional decolonization strategies largely antibiotic-driven often provide transient benefits while reinforcing resistance. This review explores the evolving role of Fecal Microbiota Transplant (FMT) as a therapeutic strategy for MDRO decolonization, synthesizing evidence from clinical trials, observational studies and mechanistic microbiome research. Comparative analyses highlight the limitations of traditional decolonization approaches and position FMT as a potentially paradigm-shifting alternative.

FMT, long established for recurrent Clostridioides difficile infection, is now being explored for its ability to restore colonization resistance and disrupt intestinal dominance of MDROs such as Carbapenem-resistant Enterobacteriaceae, extended-spectrum β-lactamase- producing organisms and Vancomycin-resistant Enterococcus. Emerging clinical evidence suggests that FMT can reduce MDRO carriage, lower resistome burden and potentially decrease infection recurrence by reconstituting microbial diversity and metabolic functionality. However, questions surrounding durability, safety, optimal patient selection and standardization continue to challenge widespread implementation.

This review synthesized current mechanistic insights and clinical evidence supporting FMT for MDRO decolonization, critically compares it with conventional strategies and examines key safety and durability considerations. This further explore future directions, including precision microbiome therapeutics, defined microbial consortia and integration with antimicrobial stewardship programs. By reframing MDRO decolonization through an ecological system, this article highlights how microbiome restoration may shift the paradigm from pathogen eradication to ecosystem rehabilitation. Understanding whether FMT represents a transitional solution or a cornerstone in the fight against antimicrobial resistance remains a pressing and provocative question for modern medicine.

Keywords: Fecal microbiota transplantation, multidrug-resistant organism, antimicrobial resistance, colonization resistance, antimicrobial stewardship.

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APP ABSTRACT - APP 2026 - 167

IMPACT OF KETOFOL VERSUS PROPOFOL ON POSTOPERATIVE COGNITION AND RECOVERY

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Abstract

Postoperative cognitive dysfunction (POCD) is a frequent complication following surgery, often impacting memory, attention, and functional recovery. Anesthetic choice plays a critical role in influencing these outcomes. Propofol, a widely used intravenous anesthetic, has been associated with hemodynamic instability and potential cognitive decline, whereas Ketofol, a combination of ketamine and propofol, is hypothesized to provide improved analgesia and hemodynamic stability with less cognitive impairment. A prospective observational comparative study was conducted at ESIS Hospital, Chennai, from November 2024 to April 2025. A total of 52 patients aged 18–70 years undergoing surgical procedures under general anesthesia were enrolled. Patients were divided into two groups: Propofol (Group P) and Ketofol (Group KP). Cognitive function was assessed using the Mini-Mental State Examination (MMSE) and Montreal Cognitive Assessment (MoCA). Pain was evaluated using the Visual Analog Scale (VAS), and functional recovery was assessed with the Modified Aldrete Scale (MAS) at baseline, 2, 24, and 48 hours postoperatively. Hemodynamic parameters were also monitored. MMSE and MAS scores showed no significant difference between the groups. However, MoCA scores indicated better preservation of higher-order cognitive function in the Ketofol group. Patients receiving Ketofol also reported significantly lower VAS pain scores and required fewer analgesics. Hemodynamic monitoring revealed greater stability in systolic and diastolic blood pressures with Ketofol compared to Propofol.

Ketofol demonstrated advantages over Propofol in reducing postoperative pain, maintaining hemodynamic stability, and potentially improving cognitive outcomes. Further large-scale trials are warranted to confirm its neurocognitive benefits.

Keywords: Postoperative cognitive dysfunction, Ketofol, Propofol, Pain management, Functional recovery, Hemodynamic stability.

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APP ABSTRACT - APP 2026 - 168

ULTRASOUND-RESPONSIVE ACOUSTIC NANOPARTICLES FOR TARGETED DRUG DELIVERY: A NOVEL THERAPEUTIC APPROACH

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Abstract

Conventional drug delivery systems often lack site specificity, resulting in systemic toxicity and reduced therapeutic efficacy. Ultrasound-responsive acoustic nanoparticles have emerged as a novel strategy for achieving controlled and targeted drug delivery. These nanocarriers utilize externally applied ultrasound waves to trigger drug release at specific sites, offering a non-invasive and highly precise therapeutic approach. This study aims to explore the design,mechanism, and pharmaceutical applications of acoustic nanoparticles in advanced drug delivery systems. A comprehensive review of recent literature (2020–2025) was conducted focusing on ultrasound-responsive, including lipid-based nanoparticles, polymeric systems,and microbubble-assisted deliveryplatforms. Mechanisms such as acoustic cavitation, thermal effects, and mechanical stress induced by ultrasound were analyzed.Preparation techniques, drug loading efficiency, and characterization parameters were also evaluated. Ultrasound-responsive nanoparticles demonstrated enhanced drug targeting, controlled release, and improved therapeutic outcomes. Cavitation effects facilitated increased permeability and drug penetration at the target site. These systems significantly reduced off-target effects and allowed spatiotemporal control of drug release. Applications in cancer therapy, gene delivery, and blood-brain barrie transport showed promising results. Ultrasound-responsive acoustic nanoparticles represent a cutting-edge advancement in nanomedicine,offering precise, controlled, and non-invasive drug delivery. Their ability to enhance therapeutic efficacy while minimizing adverse effects makes them a promising tool in modern pharmaceutical sciences and future precision medicine.

Keywords: Ultrasound-responsive nanoparticles, Acoustic nanocarriers, Targeted drug delivery, Cavitation, Controlled drug release, Nanomedicine, Stimuli-responsive systems, Drug targeting, Precision medicine

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APP ABSTRACT - APP 2026 - 169

ADVANCING POORLY SOLUBLE DRUG DELIVERY: NANOTECHNOLOGY STRATEGIES AND NANOMORPH TECHNOLOGY

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Abstract

Poor aqueous solubility remains a critical barrier in pharmaceutical development, affecting bioavailability and therapeutic efficacy of numerous drug candidates. Nanotechnology emerges as a transformative approach, utilizing nanoparticles (1-1000 nm) to dramatically enhance dissolution rates and saturation solubility via increased surface area. This review synthesizes key nanoparticle production techniques, including wet milling, high-pressure homogenization, emulsification, and precipitation methods like PCA, RESS, SFL, and EPAS, which convert coarse crystalline drugs into stable nanosuspensions or amorphous forms.

Among commercialized platforms, Nanomorph technology stands out for its precipitation-based conversion of poorly soluble drugs into amorphous nanoparticles using water-miscible solvents and polymer stabilizers. This process prevents aggregation, yielding redispersible powders suitable for diverse dosage forms, including orals and injectables. Compared to traditional methods, Nanomorph offers superior stability without Ostwald ripening, as evidenced by enhanced bioavailability in models like danazol (from 5.2% to 82.3%). Other innovations such as Dissocubes, Nanocrystal, Nanoedge, Nanopure, Crititech, and Nanocochleate further exemplify nanotechnology's versatility, bypassing chemical modifications' drawbacks like cost and toxicity risks.

Challenges include contamination risks in milling and crystallinity variations in homogenization, yet these technologies enable high drug loading and long-term stability. As pharmaceutical industries pivot toward nanoformulations, they revive abandoned compounds and support precision medicine. Future directions emphasize scalable, aseptic processes for parenteral use, positioning nanotechnology as the gold standard for solubility enhancement.

Keywords: Nanotechnology, Nanoparticles, Nanomorph technology, Bioavailability enhancement, Poorly water-soluble drugs, Nanosuspensions, Precipitation techniques

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APP ABSTRACT - APP 2026 - 170

SMART DENDRIMER-BASED THERANOSTICS FOR PRECISION CANCER DIAGNOSIS AND TARGETED THERAPY

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Abstract

Dendrimers are highly branched, nanoscale macromolecules with a well-defined, three-dimensional architecture and multiple surface functional groups, which allow for multifunctionalities and precise control over size, shape, and surface chemistry. These unique properties make dendrimers ideal candidates for theranostic applications in cancer, combining both therapeutic and diagnostic capabilities in a single nanoscale platform. The purpose of this study is to explore dendrimer-based theranostic systems for targeted cancer treatment, enabling simultaneous tumor imaging, site-specific drug delivery, and controlled drug release to improve treatment efficacy while minimizing systemic toxicity.

Theranostic dendrimers are engineered to carry anticancer drugs, imaging agents, and targeting ligands on their surface. They exploit passive targeting through the enhanced permeability and retention (EPR) effect and active targeting via receptor-ligand interactions, leading to selective accumulation in tumor tissues. Stimuli-responsive designs allow drug release triggered by tumor-specific conditions such as acidic pH, enzymes, or temperature. These mechanisms facilitate the formation of stable dendrimer–drug complexes at the tumor site while enabling real-time imaging to monitor therapeutic outcomes.

Preclinical studies have demonstrated that dendrimer-based theranostics can enhance drug delivery efficiency, improve imaging sensitivity, and reduce off-target effects. Their biocompatibility, tunable properties, and multifunctionality make them a versatile platform for precision oncology.

In conclusion, dendrimer-based theranostic systems represent a next-generation nanomedicine approach, integrating therapy and diagnostics to achieve targeted, efficient, and personalized cancer treatment. With continued research and clinical validation, these platforms have the potential to significantly advance cancer management and improve patient outcomes.

Keywords: Dendrimers, Theranostics, Targeted drug delivery, Tumor imaging, Precision oncology

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APP ABSTRACT - APP 2026 - 171

DEVELOPMENT OF REGION-SPECIFIC SPIROMETRIC NORMATIVE EQUATIONS AND GRAPHICAL NOMOGRAMS FOR SOUTH INDIAN ADULTS: A BIOSTATISTICAL MODELLING APPROACH TO ADDRESS ETHNIC VARIABILITY IN PULMONARY FUNCTION ASSESSMENT

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Abstract

Chronic respiratory diseases affect millions globally. COPD is the fourth leading cause of death worldwide in 2024. Spirometry is the gold standard to assess lung function. Its interpretation is based on reference values that depend on sex, age, height, and ethnicity. The ECSC reference values were used before 2012, later replaced by the Global Lung Function Initiative (GLI).

This research addresses a significant problem in respiratory health: the global spirometry reference standards, NHANES III and GLI 2012, are not accurate for the South Asians. These international standards overestimate lung function in Indians leading to incorrect diagnoses and misclassification of lung health. Existing Indian reference values also show discrepancies across regions, with no specific guidelines for South Indian adults. A multi-state, community-based, cross-sectional, study will be conducted across five South Indian states targeting 1,000 healthy, non-smoking adults. Detailed anthropometry, demographic variables, environmental and lifestyle exposures will be recorded. Spirometric data will be collected on FVC, FEV_1, FEV_1/FVC. Reference equations will be derived to estimate Lower Limit of Normal (LLN) and Z-scores. 10-fold internal cross-validation and external validation against global and pan-Indian standards will ensure the accuracy of models. Expected Contribution & Human Impact: A digital tool will be created for improved decision- making. The research will fill a critical gap in pulmonary diagnostics in India, ensuring clinicians have region-specific and gender-appropriate tools for spirometry assessment contributing to better respiratory health, reduced health-system burden. This study fulfils the ICMR's call for developing reference standards, making it a national priority.

Keywords: Chronic respiratory diseases, COPD, Spirometry, South Indian population, Lung function reference standards, FVC, FEV_1, LLN, Z-scores, Pulmonary diagnostics

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APP ABSTRACT - APP 2026 - 172

NANOTECHNOLOGY-BASED COSMECEUTICALS FOR PREVENTION OF SKIN AGING

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Abstract

Skin aging is a multifactorial process caused by intrinsic factors such as genetics and extrinsic factors like ultraviolet (UV) radiation, pollution, and lifestyle. UV exposure plays a major role by generating reactive oxygen species (ROS), leading to collagen degradation, wrinkles, and loss of skin elasticity. Cosmeceuticals containing antioxidants (vitamins C and E, coenzyme Q10), retinoids, and herbal compounds such as curcumin and resveratrol help in reducing oxidative stress and improving skin structure.

However, conventional topical formulations show limitations including poor skin penetration, low bioavailability, and possible irritation. To overcome these issues, nanotechnology-based delivery systems have been developed. Nanocarriers such as liposomes, niosomes, nanoemulsions, solid lipid nanoparticles (SLN), and nanostructured lipid carriers (NLC) enhance the delivery of active ingredients by improving stability, penetration, and controlled release.

These advanced systems increase therapeutic efficacy while minimizing side effects. Overall, nanotechnology-based cosmeceuticals offer a promising approach for effective prevention and management of skin aging.

Keywords: Skin aging, Cosmeceuticals ,Nanotechnology ,Drug Delivery, Photo Aging , Nano Emulsion

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APP ABSTRACT - APP 2026 - 173

PHYTOCHEMICAL ANALYSIS OF ETHANOL EXTRACT FROM PHALERIA MACROCARPA

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Abstract

Phaleria macrocarpa, commonly known as the "devil's fruit," is a plant renowned for its medicinal properties, with various bioactive compounds identified in its different parts.

This study aims to conduct a comprehensive phytochemical analysis of the ethanol extract from the fruit of Phaleria macrocarpa to evaluate its chemical

composition. The extraction process was carried out using ethanol as a solvent, and the resultant extract was analyzed for the presence of primary and secondary metabolites, including alkaloids, flavonoids, saponins, tannins, and terpenoids, through standard phytochemical screening techniques.

Results indicated the presence of several bioactive compounds that are commonly associated with medicinal activity, supporting the traditional use of P. macrocarpa in herbal medicine.

The findings highlight the potential of the ethanol extract from Phaleria macrocarpa as a valuable source of phytochemicals with therapeutic properties, paving the way for further research into its Nano particles formulation and evaluation & pharmacological.

Keywords: Phaleria macrocarpa, Diabetic, Devil's Fruit applications.

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APP ABSTRACT - APP 2026 - 174

DRUG REPURPOSING OF EXISTING APPROVED DRUGS FOR NEURODEGENERATIVE DISORDERS

Aishwarya

Abstract

Neurodegenerative disorders such as Alzheimer's disease and Parkinson's disease represent a major global health burden with limited disease-modifying therapies. Drug repurposing, which involves identifying new therapeutic uses for existing approved drugs, has gained attention as a cost-effective and time-efficient drug development strategy. Repurposed drugs benefit from established safety profiles and known pharmacokinetic data, reducing the risk and time associated with traditional drug discovery. Several drugs originally approved for diabetes, hypertension, and infections are currently being investigated for neuroprotective effects. Despite these advantages, challenges such as blood–brain barrier penetration, dose optimization, and limited clinical evidence remain significant obstacles. This review aims to summarize current progress in drug repurposing strategies for neurodegenerative diseases and discuss their translational challenges. A comprehensive literature search was conducted using biomedical databases focusing on clinical trials and mechanistic studies. Drug repurposing offers a promising pathway for accelerating therapeutic development in neurology. Future integration of computational drug design, real-world evidence, and precision medicine approaches may further enhance repurposing success in neurodegenerative disease management.

Keywords: Drug repurposing, Neurodegenerative disorders, Pharmacokinetics, Neuroprotection, Blood–brain barrier, Translational medicine, Clinical evidence

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APP ABSTRACT - APP 2026 - 175

COMPARING THE SAFETY AND EFFICACY OF SITAGLIPTIN VS DAPAGLIFLOZIN AND THE RISK OF HYPERKALAEMIA AMONG PEOPLE WITH TYPE 2 DIABETES MELLITUS AND KIDNEY DISEASE

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Abstract

Type 2 diabetes mellitus (T2DM) is a leading cause of chronic kidney disease (CKD), and the coexistence of both conditions complicates glycemic management. Novel oral antidiabetic agents, including dipeptidyl peptidase-4 (DPP-4) inhibitors such as sitagliptin and sodium-glucose co-transporter-2 (SGLT2) inhibitors such as dapagliflozin, have expanded therapeutic options. However, the risk of electrolyte disturbances, particularly hyperkalemia, remains an important consideration. To compare the safety and efficacy of sitagliptin and dapagliflozin in patients with T2DM and CKD, with emphasis on the risk of hyperkalemia. A narrative review of available clinical trial and observational data was conducted, focusing on glycemic efficacy, renal and cardiovascular outcomes, and electrolyte effects of sitagliptin and dapagliflozin in patients with varying degrees of CKD. Sitagliptin improves glycemic control by enhancing glucose-dependent insulin secretion and suppressing glucagon, with minimal effects on serum potassium. It is well tolerated in moderate-to-severe CKD when dose adjusted. Dapagliflozin exerts renoprotective and cardioprotective benefits by lowering intraglomerular pressure, promoting natriuresis, and improving metabolic parameters. Clinical evidence indicates dapagliflozin slows CKD progression and reduces hospitalization for heart failure, including in advanced CKD. However, by modulating the renin-angiotensin-aldosterone system, it may influence potassium balance, necessitating electrolyte monitoring, particularly in patients receiving concomitant renin-angiotensin inhibitors. Dapagliflozin appears to provide superior renal and cardiovascular outcomes compared to sitagliptin in T2DM with CKD, but requires vigilance for potential hyperkalemia. Sitagliptin remains a safe alternative for glycemic control with stable electrolyte effects. Individualized treatment should consider renal function, comorbidities, and concomitant therapies. Large-scale randomized controlled trials are needed to better define the relative hyperkalemia risk and guide optimal therapeutic strategies in this high-risk population.

Keywords: Type 2 diabetes mellitus, chronic kidney disease, sitagliptin, dapagliflozin, hyperkalemia, renal outcomes

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APP ABSTRACT - APP 2026 - 176

INDIAN HERBAL APPROACHES FOR DOG BITE MANAGEMENT PRIOR TO ANTI-RABIES PROPHYLAXIS

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Abstract

Rabies remains a serious public health concern, particularly in rural areas where immediate medical care may be unavailable. Traditional Indian medicine has long utilized medicinal plants to treat dog bite wounds, aiming to reduce infection and accelerate healing. Ricinus communis, Vigna membranacea, Gnidia glauca, and Cynodon dactylon have long been used as topical treatments due to their antimicrobial, anti-inflammatory, and antioxidant properties. These effects are attributed to a variety of phytochemicals, including alkaloids, flavonoids, saponins, and terpenoids, which help prevent secondary infections and promote tissue repair and regeneration. This review investigates the ethnobotanical uses, preparation methods, and pharmacological potential of these plants, focusing on their role as complementary interventions in the early stages of dog bite management. While these herbal remedies may provide some relief, they are not a substitute for vaccination or professional treatment. Systematic research and clinical trials are required to confirm efficacy and identify new compounds for anti-rabies drug development.

Keywords: Rabies, dog bites, Indian medicinal plants, phytochemicals, wound healing. Antimicrobial.

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APP ABSTRACT - APP 2026 - 177

IMPACT OF CIRCADIAN RHYTHM DISRUPTION ON HORMONAL FLUCTUATIONS AND RISK OF TYPE 2 DIABETES AND THE ROLE OF AI-ASSISTED THERAPEUTIC APPROACHES

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Abstract

Rotating night shift work disrupts the normal circadian rhythm of the human body and can lead to hormonal imbalance and metabolic disorders. This disruption affects important hormones such as Melatonin, cortisol, and insulin, which play significant roles in regulating sleep, metabolism, and blood glucose levels. Exposure to artificial light during night shifts can reduce melatonin secretion and disturb the sleep–wake cycle, leading to metabolic dysfunction. Globally, about 10–11% of adults are affected by Type 2 Diabetes, and research suggests that individuals working rotating night shifts have approximately 20–40% higher risk of developing the disease compared with daytime workers.Management strategies may include pharmacological and lifestyle interventions. The antidiabetic drug Metformin helps control blood glucose levels by reducing hepatic glucose production and improving insulin sensitivity, while melatonin supports circadian rhythm regulation and sleep quality. Together with lifestyle modifications such as regular sleep schedules, balanced diet, and physical activity, these approaches may help reduce metabolic imbalance associated with shift work.

Advancements in artificial intelligence (AI) offer promising tools for improving disease management. AI-based systems can analyze patient health data, including sleep patterns, hormonal rhythms, and glucose levels, to provide personalized treatment strategies and optimize drug timing. Wearable health monitoring devices and AI-driven drug discovery platforms may also support early detection and prevention of metabolic disorders. However, challenges remain, including limited clinical research on combination therapies, variability in patient response, and concerns regarding cost, accessibility, and data privacy in AI-based healthcare systems.

Keywords: Rotating Night Shift Work; Circadian Rhythm Disruption; Type 2 Diabetes; Melatonin; Metformin.

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APP ABSTRACT - APP 2026 - 178

FROM CHARACTERIZATION TO PREDICTION: ADVANCING PREFORMULATION AS A STRATEGIC TOOL FOR RATIONAL DOSAGE FORM DESIGN

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Abstract

Drug development is often hindered by late-stage failures arising from an insufficient understanding of drug physicochemical properties. Preformulation, traditionally considered a preliminary step, has untapped potential to act as a predictive and decision-making tool in formulation design. Current formulation strategies largely rely on empirical, trial-and-error approaches, with preformulation parameters evaluated independently rather than as an integrated system. This study aims to establish a preformulation-driven predictive framework that systematically correlates physicochemical parameters with rational dosage form design, thereby enhancing formulation efficiency and reducing development risk. A comprehensive and integrated evaluation of key preformulation parameters—including solubility, pKa, partition coefficient (log P), dissolution profile, and solid-state properties—was conducted. A model for Biopharmaceutics Classification System (BCS) Class II drug was selected to demonstrate the applicability of this framework. The integrated analysis successfully identified dissolution-limited bioavailability as the primary barrier in the model drug. The predictive mapping approach guided the selection of targeted solubility enhancement techniques, including particle size reduction and solid dispersion systems, eliminating unnecessary experimental trials. The framework demonstrated improved alignment between drug properties and formulation strategies. This study highlights preformulation as a predictive, rather than descriptive, discipline, capable of transforming pharmaceutical development into a more rational and efficient process. Adoption of this approach can significantly reduce time, cost, and failure rates while improving therapeutic performance and product quality. The proposed model aligns with modern principles of quality by design (QbD) and offers a scalable strategy for next- generation drug development.

Keywords: Strategic preformulation, Rational dosage form development, Quality by Design (QbD), Predictive modeling in pharmaceutics, Early-stage decision framework, Critical material attributes (CMA)

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DESIGN AND NOVEL SYNTHESIS OF SCHIFF BASE DERIVATIVE FOR ANTIMICROBIAL ACTIVITY

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Abstract

Schiff base derivatives have emerged as significant compounds in medicinal chemistry due to their diverse pharmacological properties, particularly their antimicrobial potential. In this study, a novel series of Schiff base derivatives was rationally designed and synthesized through condensation reactions between various substituted aromatic aldehydes and primary amines. The synthesis was carried out under mild conditions, yielding stable imine-linked compounds with good efficiency. Structural characterization of the synthesized molecules was accomplished using spectroscopic techniques such as FTIR, ^{1}H NMR, and mass spectrometry, confirming the formation of the azomethine (–C=N–) functional group. The antimicrobial activity of these compounds was evaluated against a panel of Gram-positive and Gram-negative bacteria, along with selected fungal strains, using standard in vitro assays. Results indicated that several derivatives exhibited significant antimicrobial activity, in some cases comparable to standard drugs. Structure–activity relationship analysis suggested that the presence of electron-donating and electron-withdrawing substituents on the aromatic ring played a crucial role in enhancing biological efficacy. Overall, this study demonstrates that Schiff base derivatives represent promising scaffolds for the development of new and effective antimicrobial agents.

Keywords:: Schiff base derivatives, Antimicrobial activity, Novel synthesis, Aromatic aldehydes, Primary amines, Azomethine group, Structure–activity relationship (SAR), Spectroscopic characterization, Bioactive compounds, Drug development.

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APP ABSTRACT - APP 2026 - 180

DEVELOPMENT, CHARACTERIZATION AND EVALUATION OF INTRANASAL DRUG DELIVERY SYSTEM

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Abstract:

Neurological disorders such as Migraine and Alzheimer's disease require effective drug delivery to the brain; however, conventional oral administration often shows limited efficiency due to poor bioavailability, systemic side effects, and non-selective drug distribution. Intranasal drug delivery has emerged as a promising strategy to bypass the blood–brain barrier and provide direct nose-to-brain transport. The present study aimed to formulate and evaluate nanostructured lipid carriers (NLCs) for enhanced intranasal delivery of Sumatriptan, used in migraine management, and Astaxanthin, a potent antioxidant with neuroprotective properties for Alzheimer's disease therapy.Drug-loaded NLCs were prepared and optimized using experimental design approaches such as D-optimal design and hot high-pressure homogenization. The optimized formulations were characterized for particle size, polydispersity index (PDI), zeta potential, morphology using electron microscopy, thermal behavior, drug loading, and entrapment efficiency. Drug release studies were also conducted to determine the release kinetics of the formulations. In vivo pharmacokinetic and therapeutic evaluations were performed in Sprague–Dawley rat models, and neuropharmacokinetic parameters including drug targeting efficiency (DTE) and direct transport percentage (DTP) were calculated.The optimized NLCs exhibited nanosized particles (approximately 101–143 nm), low PDI (~0.24–0.27), high drug entrapment efficiency (around 91–94%), and stable negative zeta potential with spherical morphology. The formulations showed biphasic drug release, consisting of an initial burst followed by sustained release. Intranasal administration significantly enhanced brain targeting, with DTE reaching 258% and DTP about 61%. Additionally, NLC treatment reduced oxidative stress, neuroinflammation, amyloid-related markers, and apoptosis while improving neurotransmitter levels.NLC-based intranasal delivery significantly improved brain targeting and therapeutic efficacy, indicating its potential as an effective strategy for treating neurological disorders such as migraine and Alzheimer's disease.

Keywords: Brain targeting efficiency, Neuropharmacokinetics, Drug targeting efficiency (DTE), Direct transport percentage (DTP)

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APP ABSTRACT - APP 2026 - 181

PERSONALIZED MEDICINE IN HYPERTENSION: A STEP TOWARDS TARGETED THERAPY

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Hypertension is a complex, multifactorial disease requiring individualized treatment approaches. This study explores the role of genetic markers and patient-specific factors in optimizing antihypertensive therapy.Prospective, observational study of 150 hypertensive patients. Genetic markers (e.g., ACE, AGT, CYP11B2) and patient-specific factors (e.g., age, sex, kidney function) were analyzed. Patients were treated with standardized antihypertensive regimens and monitored for 6 months.Genetic marker analysis identified 30% of patients with variants associated with reduced response to certain antihypertensives. Patient-specific factors, such as kidney function and age, significantly influenced treatment outcomes. Personalized treatment approaches, based on genetic and patient-specific factors, resulted in improved blood pressure control ($p < 0.01$) and reduced adverse events ($p < 0.05$).This study demonstrates the potential of personalized medicine in hypertension, highlighting the importance of genetic markers and patient-specific factors in optimizing antihypertensive therapy.

Keywords

Personalized medicine, hypertension, genetic markers, patient-specific factors, targeted therapy, antihypertensive treatment

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APP ABSTRACT - APP 2026 - 182

ADVANCED STRATEGIES FOR ENHANCING ORAL BIOAVAILABILITY OF POORLY WATER-SOLUBLE DRUGS

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ABSTRACT

The oral bioavailability of a significant number of recently discovered therapeutic compounds is adversely affected by poor water solubility, presenting a critical challenge in pharmaceutical research. Medications categorized as Class II and Class IV in the Biopharmaceutics Classification System (BCS) often exhibit inadequate dissolution in gastrointestinal fluids, which subsequently restricts absorption and reduces therapeutic efficacy.

To address these challenges, numerous strategies for improving bioavailability have been developed. Techniques such as particle size reduction, solid dispersion systems, lipid-based formulations, and innovative drug delivery methods rooted in nanotechnology have demonstrated considerable potential for enhancing drug solubility and dissolution rates. Advanced carriers, including self-emulsifying drug delivery systems (SEDDS), liposomes, nanoparticles, and nanoemulsions, further support enhanced systemic medication absorption by improving drug permeability.

In , modern formulation techniques are crucial for overcoming solubility-related barriers and enhancing the oral bioavailability of poorly soluble medications. Ongoing research into these advanced drug delivery methods is expected to amplify therapeutic efficacy and aid in the development of more effective pharmaceutical formulations.

Keywords: Bioavailability enhancement, poorly water-soluble drugs, BCS Class II drugs, Nanotechnology, Drug delivery systems.

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APP ABSTRACT - APP 2026 - 183

IN SILICO EVALUATION OF ANTI-DIABETIC AND IMMUNOMODULATORY ACTIVITY OF SELECTED MEDICINAL HERBS

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ABSTRACT

Capparis species is a medicinal plant with potential therapeutic value in metabolic and immune-related disorders. The present study aimed to evaluate the ant diabetic and immunomodulatory activity of its phytoconstituents using in silicon approaches. Reported bioactive compounds were subjected to molecular docking against key antidiabetic targets such as α-glucosidase and DPP-IV, along with immunomodulatory targets including NF-κB. Binding affinity, interaction patterns, and ADMET properties were analyzed to assess drug-likeness and pharmacokinetic behavior.The demonstrated significant binding interactions of selected compounds with target proteins, showing comparable affinity to standard drugs. ADMET predictions indicated favorable absorption and low toxicity profiles.These findings suggest that Capparis species may serve as a promising source of bioactive compounds with dual antidiabetic and immunomodulatory potential, warranting further experimental validation.

Keywords:DPP –Dipeptidyl peptidase, Immunomodulatory,ADMET.

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APP ABSTRACT - APP 2026 - 184

PHARMACOKINETICS OF NOVEL DRUG DELIVERY SYSTEMS

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Abstract:

This review examines novel drug delivery systems for iron, including carrier-based, M-cell-targeting, and controlled/sustained-release formulations, to improve iron bioavailability while reducing gastrointestinal side effects seen with conventional iron therapy.Significance: Iron deficiency anemia (lDA) remains a major global health problem, especially among women.children, and other vulnerable groups, and is linked to poor maternal and public health outcomes.This review summarizes recent literature, clinical trials, and patents to outline the advantages, limitations, and future potential of advanced iron delivery technologies. Better understanding of these systems may support thedevelopment of safer and more effective iron therapies.Advanced delivery systems such as liposomes, hydrogels, microspheres, nanoparticles,solid lipid nanoparticles, and sucrosomial iron enhance intestinal iron absorption and improve systemic bioavailability compared with conventional products. M-cell targeting promotes transcytosis of iron across the intestinal epithelium, further increasing absorption.Controlled-release and gastroretentive dosage forms prolong iron release at absorption sites and help reduce gastrointestinal adverse effects.

Keywords:

M- cell targeting,anemia,liposomes,nanoparticles

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APP ABSTRACT - APP 2026 - 185

ADVANCING GREEN ANALYTICAL CHEMISTRY: LC–MS/MS METHOD DEVELOPMENT FOR ULTRA-TRACE NITROSAMINE AND GENOTOXIC IMPURITY CONTROL

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Nitrosamines and genotoxic impurities (GTIs) pose critical mutagenic/carcinogenic risks in pharmaceuticals at ultra-low concentrations. LC–MS/MS excels for trace analysis due to sensitivity, specificity, and regulatory acceptance. Integrating green principles—solvent minimization, eco-friendly mobile phases, reduced analysis time—enables sustainable impurity profiling.Nitrosamines/GTIs challenge pharmaceutical safety at trace levels. This study develops/validates a green LC–MS/MS method for ultra-trace detection/quantification of selected nitrosamines/GTIs, emphasizing reduced solvent use, eco-friendly phases, and simplified preparation. Short C18 column with gradient elution achieved separation; MRM mode ensured sensitivity/selectivity. Linearity spanned low-ppb range; LOD/LOQ beat regulatory limits. Validation confirmed accuracy, precision, specificity, robustness. It merges green chemistry with compliance for routine monitoring.Green preparation minimized handling/solvents: weigh/dissolve/filter drug substances/dosage forms; use certified standards. Employed HPLC water, judicious ethanol/acetonitrile, ammonium formate/acetate buffers. LC–MS/MS with short C18 column, aqueous buffer + low organic modifier under optimized gradient for short runtime.Outperforms conventional methods by slashing solvent use, time, and waste; MS-compatible low-toxicity solvents sustain analysis without performance loss.

Keywords:

Green analytical chemistry; LC–MS/MS; Nitrosamines; Genotoxic impurities; Pharmaceutical analysis.

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APP ABSTRACT - APP 2026 - 186

ANTIBIOTIC USE IN PREGNANCY AND LACTATION- REVIEW ARTICLE

Author- Defria Zeneth B, Corresponding Author- Dr. K Karthickeyan

Abstract:

This study aims to evaluate antibiotic utilization patterns in pregnant and lactating women and to assess their impact on maternal and fetal health outcomes. This study will incorporate both quantitative and qualitative data analysis derived from clinical databases, prescription records, and structured interviews with healthcare providers as well as pregnant and lactating women. In addition, the study seeks to classify commonly prescribed antibiotics according to their safety profiles and trimester-specific risks, and to evaluate adherence to established clinical guidelines. It will also assess factors influencing prescribing practices, including physician knowledge, patient awareness, and healthcare accessibility. Furthermore, this research will examine the short- and long-term maternal and neonatal outcomes associated with antibiotic exposure, including potential adverse drug reactions, antimicrobial resistance patterns, and effects on neonatal microbiota. Special attention will be given to identifying high-risk drug categories and inappropriate prescriptions. The findings are expected to support the development of evidence-based strategies to optimize antibiotic prescribing during pregnancy and lactation, thereby improving maternal and fetal health outcomes and promoting rational drug use.

Keywords:
antibiotic exposure, lactating, trimester, antimicrobial

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APP ABSTRACT - APP 2026 - 187

Nanocarrier-Based Targeted Drug Delivery Systems for the Management and Treatment of Cardiovascular Diseases

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Abstract

Cardiovascular diseases (CVDs) remain a leading cause of morbidity and mortality worldwide,necessitating advanced therapeutic strategies for effective management. Conventional drug delivery systems often suffer from poor bioavailability, non-specific distribution, and systemicside effects. Nanocarriers have emerged as a promising approach to overcome these limitations by enabling targeted and controlled drug delivery. These nanoscale systems, including liposomes, polymeric nanoparticles, dendrimers, solid lipid nanoparticles, and nano emulsions,enhance drug solubility, stability, and therapeutic efficacy. Nanocarriers can be engineered to selectively target diseased tissues such as atherosclerotic plaques, improving drug accumulation at the site of action while minimizing off-target effects. Additionally, they offer controlled and sustained drug release, reducing dosing frequency and improving patient compliance. Surface modification of nanocarriers with ligands further enhances specificity and cellular uptake. Despite significant advancements, challenges such as toxicity, large-scale production, and regulatory approval remain. Overall, nanocarriers represent a transformative strategy in cardiovascular pharmacotherapy, offering improved clinical outcomes and paving the way for personalized medicine.

Keywords

Nanocarriers, Cardiovascular diseases, Targeted drug delivery, Nanoparticles, Liposomes, Controlled release, Atherosclerosis, Drug delivery systems

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APP ABSTRACT - APP 2026 - 188

ARTIFICIAL INTELLIGENCE IN DIGITAL HEALTH: EXPANDING THE ROLE OF CLINICAL PHARMACISTS

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Artificial Intelligence (AI) has emerged as a transformative technology in digital health and telemedicine, enabling healthcare professionals to deliver more efficient, personalized, and accessible care. AI applications such as machine learning algorithms, natural language processing, and predictive analytics are increasingly used in disease diagnosis, drug therapy optimization, and remote patient monitoring. With the growing adoption of digital health technologies, the role of clinical pharmacists has evolved beyond traditional dispensing functions toward patient-centered care and clinical decision support. Clinical pharmacists are essential in ensuring the safe and effective use of medications, monitoring therapeutic outcomes, and preventing adverse drug reactions. The integration of AI in digital health provides new opportunities for pharmacists to enhance medication therapy management, improve medication adherence, and support pharmacovigilance activities. This study aims to explore the applications of AI in digital health and telemedicine and evaluate its impact on the expanding role of clinical pharmacists.A narrative review approach was adopted to evaluate the role of artificial intelligence in digital health and its impact on clinical pharmacy practice. Relevant literature was identified from peer-reviewed journals, clinical studies, and healthcare technology reports published in recent years. The review focused on AI applications in medication management, clinical decision support systems, pharmacovigilance, and telemedicine services. Data were analyzed to assess the implications of AI integration for clinical pharmacists and patient care outcomes.The findings indicate that AI technologies significantly enhance medication management, clinical decision support, and patient monitoring in digital health settings. AI-driven systems improve medication adherence, reduce medication errors, and support early detection of adverse drug reactions. Telemedicine platforms integrated with AI tools enable remote patient monitoring and personalized pharmacotherapy interventions. Furthermore, the adoption of AI expands the role of clinical pharmacists in data interpretation, therapeutic decision-making, and patient counseling. However, challenges such as data privacy concerns, limited technical expertise, and regulatory barriers were identified as potential limitations in AI implementation.Artificial intelligence plays a critical role in advancing digital health and telemedicine by improving healthcare delivery, medication safety, and clinical outcomes. The integration of AI technologies expands the role of clinical pharmacists in pharmaceutical care, enabling them to contribute more effectively to patient management and therapeutic optimization. Despite existing challenges, the adoption of AI-driven healthcare solutions offers significant opportunities for enhancing clinical pharmacy practice. Future research and training programs are essential to support the effective implementation of AI in digital health and strengthen the role of clinical pharmacists in evolving healthcare systems.

Keywords

Artificial Intelligence, Digital Health, Telemedicine, Clinical Pharmacists, Pharmacotherapy, Medication Management, Clinical Decision Support, Pharmacovigilance

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AN EVALUATION OF ANTIBIOTIC PRESCRIPTION PATTERN AND DRUG RATIONALITY ANALYSIS AMONG OUTPATIENTS AT PUBLIC HEALTH SETTING, INDIA

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Abstract

Antimicrobial resistance (AMR) poses a top global health threat, driven largely by inappropriate antibiotic prescribing. The WHO's Global Action Plan emphasizes prudent antibiotic use to curb AMR, yet up to 50%of prescriptions worldwide remain irrational, especially in outpatient settings of developing countries likeIndia. Factors such as overprescription without diagnostics exacerbate the issue.PurposeThis study evaluated antibiotic prescribing patterns and rationality in a public community health facility serving 12,900 urban-rural populations in North India, aiming to identify gaps and inform stewardship interventions.A cross-sectional audit of 1,219 outpatient antibiotic prescriptions occurred from August 2021 to August2022. Experts (ID specialists, clinical pharmacologists) assessed drug type, dose, duration, adherence toNCDC/PGIMER guidelines, WHO AWaRe classification, diagnoses, and essential drug list compliance using standard protocols.Prescriptions skewed female (54%) and aged 20-40 years. Amoxicillin-clavulanic acid (27.2%),metronidazole (13.4%), and azithromycin (10.3%) dominated. AWaRebreakdown: 49.7% Access, 27.3%Watch, 0% Reserve. Rationality varied: 57% for urinary tract infections, but only 29% for respiratory tractinfections. Diarrhea and respiratory infections emerged as key areas for reducing overuse.Findings highlight suboptimal prescribing, particularly for self-limiting infections,underscoring needs prescriber training, audit oversight, and evidence-based guidelines to boost Access antibiotic use towardWHO targets and combat AMR.

Keywords

Antibiotic prescribing patterns, Antimicrobial resistance (AMR), Drug rationality,AWaRe classification,Amoxicillin-clavulanic acid, Antimicrobial stewardship, Prescription audit, Drug use evaluation,Community health facility

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APP ABSTRACT - APP 2026 - 190

PHARMACOKINETICS OF NOVEL DRUG DELIVERY SYSTEM

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Abstract:

Paeonol is a type of phenol that has biological activity. lIt can be found in a number of different sources,including the plant Dioscorea japonica, as well as some varieties of the Paeonia plant (specifically Paeonia suffruticosa and Paeonia lactiflora). In addition to being found in these plants, there has been a lot of research conducted regarding the pharmacological effects of paeonol.

The purpose of this research is to review the chemistry, pharmacokinetics, pharmacological effects, and some of the formulations of paeonol.We have searched several different scientific databases (e.g, PubMed, Scopus, and ProQuest)for the term "paeonol" and have reviewed all papers related to this term. We have searched the scientific literature published from 1969 through 2019 Researchers have synthesized several different derivatives of paeonol (methoxy,ethoxy,piperazine, chromonylthiazolidine, phenol-phenylsulfonyl, alkyl ether, aminothiazole, and tryptamine) that enhance the stability of paeonol. They have also evaluated these derivatives for various In vitro biological activities e.g.., anti-inflammatory, tyrosinase Inhibitory, neuroprotective, anticancer, and antiviral). Even though paeonol has multiple potential uses as a therapeutic agent, has not been widely used clinically due to S poor water solubility, low oral bioavailability, low stability, and high volatility when exposed to room temperature. To increase the bioavailability of paeonol, researchers have createdvariousformulations that can be used to deliver paeonol and have evaluated the pharmacological activity of these formulations; these formulations of paeonol can be classified In several ways (e.g, conventional formulations (tablets, topical gels, and hydrogels); polymeric delivery systems (microparticles,microsponges, dendrimers, nanocapsules, polymeric nanoparticles, and nanospheres); and lipid-based delivery systems, liposomes,delivery systems (microemulsions, self-micro-emulsifying drug transethosomes, ethosomes,niosomes, and proniosomes)

Key words

Paeonol, phenolic compound, biological activity, Dioscorea japonica, Paeonia suffruticosa,Paeonia lactiflora,pharmacology, chemistry, pharmacokinetics, anti-inflammatory activity, tyrosinase

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BIOAVAILABILITY ENHANCEMENT USING NOVEL DRUG DELIVERY SYSTEM

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Abstract:
Bioavailability is an important pharmacokinetic parameter that refers to the rate and extent to which a drug reaches the systemic circulation Many drugs shopoorbioavailability due to low solubility, poorpermeability, and extensivefirst-passmetabolism. This can reduce the therapeutic effectiveness of the drug. To overcome these limitations, various novel drug delivery systems (NDDS) have been developed to enhance drug solubility, stability, and absorptionNovel approachessuchasnanoparticles, liposomes, nanoemulsions, solid dispersions, and polymeric drug delivery systems are widely used to improve the bioavailability of poorly soluble drugs. These systems increase the surface area of the drug, enhance dissolution rate, and promote better absorption in the gastrointestinal tract. As a result, they improve therapeutic efficiency and reduce the required dosage and side effectsThis project focuses on the concept of bioavailability enhancement using novel drug delivery systems and highlights the importance of advanced formulation techniques in improving drug delivery and pharmacokinetic performance

keyword:
Bioavailability, Novel Drug Delivery Systems(NDDS), Drug Absorption ,Solubility Enhancement ,Nanoparticles, Liposomes, Nanoemulsion, SolidDispersion, Pharmacokinetics, delivery Systems.

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APP ABSTRACT - APP 2026 - 192

ADVANCES IN NANOTECHNOLOGY

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ABSTRACT

As a new and interdisciplinary area, nanotechnology has a vast potential application in food nutrition and human health due to its special structural characteristics and surface effects. This paper introduces the recent progress of nanotechnology in food production, nutritional delivery, and health interventions. Nanoparticles have clearly improved food safety and quality stability in the food production industry, thanks to the development of antimicrobial packaging materials, advanced sensing systems, and innovative food processing technologies. In addition, nutritional science has leveraged nanocarrier-based delivery systems, such as liposomes, nanoemulsions, and biopolymer particles, to improve the bioavailability and targeted delivery of bioactive molecules in the human body.

As a result, nanotechnology provides new strategies for the prevention and personalized treatment of chronic diseases in health interventions,allowing for precise control over nutritional delivery and its functional outcomes. On the other hand, the application of nanotechnology faces challenges, such as the need for further research on safety assessments. Future research studies should focus on improving the manufacturing processes of nanomaterials, carrying out comprehensive investigations of their metabolic pathways in the human body, and upgrading relevant safety guidelines to promote the long-term development of nanotechnology in the areas of food production, nutrition, and health interventions.

Keywords: Nanotechnology,Food production,Food safety,Nutritional delivery

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APP ABSTRACT - APP 2026 - 193

NANOTECHNOLOGY

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Abstract:

Nanotechnology refers to manipulating materials on the nano scale (1 to 100 nm), which exhibit distinct physical, chemical, and biological properties. It has applications across different fields such as medicine, electronics, energy, and environmental science.Nanoparticles were synthesized by chemical reduction and green synthesis, with characterization evaluated using UV-Vis spectroscopy, scanning electron microscopy (SEM), and x-ray diffraction (XRD) to assess their size, structure, and morphology.The synthesized nanoparticles possessed an even size distribution with excellent surface area. Nanoparticles exhibited unique functional characteristics resulting in improved catalytic activity, enhanced drug delivery capabilities, and greater effectiveness as an antimicrobial agent. The use of green methods was both environmentally friendly and cost-effective compared to traditional methods.Nanotechnology provides an opportunity for innovative solutions across a broad range of industries through the enhancement of physical and chemical properties of material. The of this research demonstrate that nanoparticles chemically synthesized using efficient methods have a considerable amount of potential for biomedical and industrial applications. Future investigations should emphasize production at scale, safety, and environmental effects to achieve sustainability in development.

KEYWORDS: Absorption,Drug concentration,Systamic circulation ,Rate of absorption

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APP ABSTRACT - APP 2026 - 194

BIOAVAILABILITY

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Abstract: Superporous hydrogels (SPH) and composite (SPHC) delivery systems were tested in vivo and found to enhance the ability of insulin to be absorbed through the intestine of pigs. This method of insulin delivery may prove to be a viable means of delivering insulin via the intestinal route. Six female pigs were used in the study to test the core (c.i.) and core outer (c.o.) formulations as well as measure how well SPHC (core inside/c.i.) performs compared to c.o. and intraduodenal insulin. SPHC- based oral delivery systems will continue to require enhancements for optimized in vivo peptide drug delivery while delivering insulin to the intestinal mucosa. SPH/SPHC polymers do provide ways for the human body to use these systems as a method of increasing the absorption of insulin from the intestines. Although absorption will be marginally increased from these systems, subsequent studies will show significant variability of the actual obtained with these systems probably from physiological variances among the subjects tested.

KEYWORDS: Absorption,Drug concentration,Systamic circulation ,Rate of absorption

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APP ABSTRACT - APP 2026 - 195

NUTRIGENOMIC REGULATION OF OOCYTE QUALITY AND FEMALE REPRODUCTIVE FUNCTION: MOLECULAR MECHANISMS AND ENVIRONMENTAL INTERACTIONS.

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Abstract Oocyte quality is a fundamental determinant of female reproductive competence and directly influences fertilization, embryonic development, and successful pregnancy outcomes. Emerging evidence in Nutrigenomics indicates that dietary components can regulate gene expression and metabolic pathways associated with ovarian physiology. Nutrient–gene interactions are known to influence essential cellular mechanisms including mitochondrial energy metabolism, chromosomal integrity, meiotic spindle formation, and oxidative stress responses, all of which contribute to the developmental competence of oocytes. Understanding these molecular interactions may provide insight into the role of nutrition in maintaining reproductive health and preventing fertility-related disorders.The objective of this study is to analyze the influence of nutrigenomic interactions on molecular pathways regulating oocyte quality and ovarian function, and to evaluate how diet-derived bioactive compounds modulate gene expression associated with reproductive health. Evidence from scientific studies demonstrates a significant relationship between nutrition, gene expression, and female reproductive physiology. Current research highlights that dietary components can influence molecular pathways involved in ovarian function and oocyte development. The selected studies were examined to evaluate the effects of nutritionally relevant bioactive molecules such as Folate (Vitamin B9), Vitamin D, and Coenzyme Q10 on mitochondrial activity, genomic stability, and hormonal regulation during oocyte maturation. The findings suggest that nutrigenomic mechanisms play a significant role in regulating ovarian cellular processes that determine oocyte competence. Nutrient-mediated modulation of gene expression may enhance mitochondrial efficiency, reduce oxidative stress, and maintain chromosomal stability, thereby supporting normal reproductive function.

Keywords

Nutrigenomics; Oocyte quality; Female reproductive health; Gene–diet interaction; Ovarian physiology; Mitochondrial metabolism; Fertility regulation.

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APP ABSTRACT - APP 2026 - 196

FROM ETHNOBOTANY TO ALGORITHMS: TRANSFORMING DRUG DISCOVERY THROUGH COMPUTATIONAL PHARMACOGNOSY

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Abstract The intersection of classical ethnobotanical science with computational science is transforming the trend of drug discovery using natural products. A rich, experience-based traditionally hidden depository of medicinal plant application, ethnobotany has long suffered in the translation of clinical useful therapeutics, with limitations in the areas of standardization, target identification, and mechanistic validation. Computational pharmacognosy circumvents these weaknesses by incorporating in silico software, with a spectrum between cheminformatics and molecular modeling (including machine learning and network pharmacology), into the natural products pipeline. This talk identifies a methodological conceptual framework that brings together ethnobotanical intelligence and discovery algorithms. This is done by first curating and digitizing ethnopharmacological leads into structured databases, then phytochemical profiling and generation of virtual libraries. To predict bioactivity, binding affinity and target specificity of compounds found in plants, advanced computational methods are utilised to predict them, such as quantitative structure/activity relationship (QSAR) modeling, molecular docking, and molecular dynamics simulations. At the same time, machine learning algorithms can be used to recognize patterns in large phytochemical datasets, allowing to identify new lead molecules and multi-target interactions that are typical of phytoconstituents. Moreover, network pharmacology gives a systems level insight into herb-compound-target-pathway interactions, which is consistent with polypharmacological properties of natural products. The case-based insights underscore the significance of how computational prioritization leads to the important minimization of experimental load, fastens hit-to-lead optimization, and improves the translatability. Although such developments have taken place, certain critical areas have arisen such as heterogeneity of data, poor access to quality phytochemical databases, and the requirement of quality experimental validation. In general, this integrative paradigm highlights a paradigm shift in empirical plant-based medicine to predictive, data-driven pharmacognosy. Computational pharmacognosy will provide an efficient and scalable approach to identifying next-generation therapies in nature based on its chemical diversity through the integration of traditional knowledge with the power of computation.

Keywords: Computational Pharmacognosy, Ethnobotany, Natural Product Drug Discovery, Machine Learning, Network Pharmacology

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APP ABSTRACT - APP 2026 - 197

MEDICINAL CHEMISTRY STUDIES AGAINST NEURODEGENERATIVE DISEASES.

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Abstract:

Medicinal chemistry is an interdisciplinary area that involves organic chemistry, biochemistry, physical chemistry, pharmacology, informatics, molecular biology, structural biology, cell biology, and other areas. Moreover, it takes into account molecular aspects such as the mode of action of the drugs, the structure-activity relationship of the drugs, and pharmacokinetic aspects such as absorption, distribution, metabolism, excretion, and toxicity. Neurodegenerative diseases (NDs), which are characterized by the progressive loss of neurons, are on the rise. Oxidative stress, especially the overproduction of Reactive Oxygen Species (ROS), plays a pivotal role in the development of various diseases, as evidenced by the detection of protein, lipid, and Deoxyribonucleic acid (DNA) oxidation products in vivo. Since they are inherently fragile, most biological molecules are susceptible to ROS, even if they are involved in metabolic factors and cell signaling. Because of their high polyunsaturated fatty acid content, low antioxidant defense, and high oxygen consumption, neurons are inherently susceptible to oxidation. Consequently, the overproduction of ROS in neurons appears particularly toxic, and the mechanisms involved in biomolecule oxidative damage are complex and multiple. This review aims to highlight the generation and regulation of ROS, as well as their chemical properties (thermodynamic and kinetic), interactions, and implications in NDs.

Key words: neurodegenerative, defense, pharmacokinetics, oxidation, DNA

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APP ABSTRACT - APP 2026 - 198

Nanotechnology-based intelligent drug design for cancer Metastasis treatment

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Abstract:

Nanotechnology is becoming an important tool in modern healthcare, especially for improving drug delivery methods. Most chemotherapy treatments currently used for cancer were developed decades ago during the early period of the cancer research movement. While these drugs are effective at killing cancer cells in laboratory settings, they often have harmful effects on healthy cells in the body. This intrinsic imprecision can engender considerable detrimental consequences, including increased toxicity, impaired immune responses, and a reduced quality of life for those impacted. To address these limitations, Nano medicine has surfaced as an innovative approach to cancer treatment. Nanoparticles possess unique physical and biological characteristics that enable the more accurate delivery of therapeutic compounds to tumoursites. As a result, targeted drug delivery systems (TDDS) utilizing nanotechnology can augment drug concentrations at the tumour , while simultaneously lessening damage to healthy tissues . This article discusses various nanotechnology-based pharmaceutical platforms used for cancer metastasis therapy, highlighting their design strategies, benefits, and limitations compared with conventional chemotherapy. Additionally, it evaluates how nanomaterials may enhance the effectiveness and safety of treatments aimed at controlling and treating cancer metastasis.

Key words: nanotechnology, chemotherapy, tumours, Nano medicine, cancer, metastasis

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APP ABSTRACT - APP 2026 - 199

PHARMACOKINETICS OF NOVEL DRUG DELIVERY SYSTEM

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Abstract:

Paeonol is a type of phenol that has biological activity. It can be found in a number of different sources, including the plant Dioscorea japonica, as well as some varieties of the Paeonia plant (specifically Paeonia suffruticosa and Paeonia lactiflora). In addition to being found in these plants, there has been a lot of research conducted regarding the pharmacological effects of paeonol. The purpose of this research is to review the chemistry, pharmacokinetics, pharmacological effects, and some of the formulations of paeonol. We have searched several different scientific databases (e.g., PubMed, Scopus, and ProQuest) for the term "paeonol" and have reviewed all papers related to this term. We have searched the scientific literature published from 1969 through 2019. Researchers have synthesized several different derivatives of paeonol (methoxy, ethoxy, piperazine, chromonylthiazolidine, phenol-phenylsulfonyl, alkyl ether, aminothiazole, and tryptamine) that enhance the stability of paeonol. They have also evaluated these derivatives for various in vitro biological activities (e.g., anti-inflammatory, tyrosinase inhibitory, neuroprotective, anticancer, and antiviral). Even though paeonol has multiple potential uses as a therapeutic agent, it has not been widely used clinically due to its poor water solubility, low oral bioavailability, low stability, and high volatility when exposed to room temperature. To increase the bioavailability of paeonol, researchers have created various formulations that can be used to deliver paeonol and have evaluated the pharmacological activity of these formulations; these formulations of paeonol can be classified in several ways (e.g., conventional formulations (tablets, topical gels, and hydrogels); polymeric delivery systems (microparticles, microsponges, dendrimers, nanocapsules, polymeric nanoparticles, and nanospheres); and lipid-based delivery systems (microemulsions, self-micro-emulsifying drug delivery systems, liposomes, transethosomes, ethosomes, niosomes, and proniosomes).

Keywords:

Paeonol, phenolic compound, biological activity, Dioscorea japonica, Paeonia suffruticosa, Paeonia lactiflora, pharmacology, chemistry, pharmacokinetics, anti-inflammatory activity, tyrosinase inhibition

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APP ABSTRACT - APP 2026 - 200

PHARMACOKINETICS OF NOVEL DRUG DELIVERY SYSTEMS.

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Abstract:

This review examines novel drug delivery systems for iron, including carrier-based delivery, M-cell targeting, and controlled/sustained-release formulations, to improve iron bioavailability while reducing gastrointestinal side effects seen with conventional iron therapy. Significance: Iron deficiency anemia (IDA) remains a major global health problem, especially among women, children, and other vulnerable groups, and is linked to poor maternal and public health outcomes. This review summarizes recent literature, clinical trials, and patents to outline the advantages, limitations, and future potential of advanced iron delivery technologies. Better understanding of these systems may support the development of safer and more effective iron therapies. .dvanced delivery systems such as liposomes, hydrogels, microspheres, nanoparticles, solid lipid nanoparticles, and sucrosomial iron enhance intestinal iron absorption and improve systemic bioavailability compared with conventional products. M-cell targeting promotes transcytosis of iron across the intestinal epithelium, further increasing absorption. Controlled-release and gastroretentive dosage forms prolong iron release at absorption sites and help reduce gastrointestinal adverse effects.

Keywords:

iron deficiency anemia; iron bioavailability; M cells; nanocarriers; controlled release; gastroretentive systems; clinical trials; patents.

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APP ABSTRACT - APP 2026 - 201

MEDICINAL CHEMISTRY

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Abstract:
This document discusses the trends within sustainable fashion concerning Generation Z (Gen Z), and how they have changed consumer norms based on their preferences and purchasing habits. As described in this report, finding new drug candidates can often be aided by adding a heterocycle to their overall structure. Many different types of heterocycles exist, and numerous reviews have been published covering their relevance to medicinal chemistry. An oxadiazole is a type of heterocycle that contains one oxygen atom and two nitrogen atoms and can exist in three distinct isomeric configurations. The most prevalent isomers of the oxadiazole are the 1,2,4- and 1,3,4-oxadiazoles,whereas the least prevalent isomer is the 1,2,5-oxadiazole (also known as a furazan). The function of this review article is to provide an overview of how furazans are being used in medicinal chemistry and drug development base on a synthesis of information from various sources including by those academia and industry, as well as patents. The author intends to provide insight into furazans used for clinical and preclinical investigations, and will compare furazans to other uses of heterocyclic compounds and pharmacophores that are commonly used in medicinal chemistry.

Key words:
Sustainable fashion, Generation Z (Gen Z), consumer behavior, purchasing habits, heterocycles, medicinal chemistry, drug discovery, oxadiazole, 1,2,4-oxadiazole, 1,3,4-oxadiazole, 1,2,5-oxadiazole (furazan), drug development, pharmacophores, clinical and preclinical studies, and pharmaceutical research.

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APP ABSTRACT - APP 2026 - 202

MEDICINAL CHEMISTRY STUDIES AGAINST NEURODEGENERATIVE DISEASES.

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Abstract
Medicinal chemistry is an interdisciplinary area that involves organic chemistry, biochemistry,
physical chemistry, pharmacology, informatics, molecular biology, structural biology, cell biology, and other areas. Moreover, it takes into account molecular aspects such as the mode of action of the drugs, the structure-activity relationship of the drugs, and pharmacokinetic aspects such as absorption, distribution, metabolism, excretion, and toxicity. Neurodegenerative diseases (NDs), which are characterized by the progressive loss of neurons, are on the rise. Oxidative stress, especially the overproduction of Reactive Oxygen Species (ROS), plays a pivotal role in the development of various diseases, as evidenced by the detection of protein, lipid, and Deoxyribonucleic acid (DNA) oxidation products in vivo. Since they are inherently fragile, most biological molecules are susceptible to ROS, even if they are involved in metabolic factors and cell signaling. Because of their high polyunsaturated fatty acid content, low antioxidant defense, and high oxygen consumption, neurons are inherently susceptible to oxidation. Consequently, the overproduction of ROS in neurons appears particularly toxic, and the mechanisms involved in biomolecule oxidative damage are complex and multiple. This review aims to highlight the generation and regulation of ROS, as well as their chemical properties (thermodynamic and kinetic), interactions, and implications in NDs.

Key words: neurodegenerative, defense, pharmacokinetics, oxidation, DNA

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APP ABSTRACT - APP 2026 - 203

PHARMACOKINETICS AND ITS ROLE IN DRUG DEVELOPMENT

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Abstract:
Pharmacokinetics plays a crucial role in drug development by studying how a drug is absorbed,distributed, metabolized, and excreted in thebody. These processes, collectively known as ADME, help determine thedrug's concentration in the bloodstream and its overall therapeutic effect.During drug development, pharmacokinetic studies are essential forevaluating the safety, efficacy, and optimal dosage of new drug candidates. Understanding pharmacokinetics also helps researchers identify potential drug interactions, improve bioavailability, and reduce adverse effects. Modern pharmacokinetic techniques, including modelingand simulation, allow scientists to predict drug behavior in differentpopulations and optimize treatment strategies. By providing essential information about how drugs behave in the body, pharmacokineticssignificantly contributes to the development of safer and more effective pharmaceutical products.

Keywords:
Pharmacokinetics, Drug Development, ADME (Absorption,Distribution, Metabolism, Excretion), Bioavailability, DrugSafety, Drug Efficacy, Pharmacokinetic Modeling, Drug Interactions.

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APP ABSTRACT - APP 2026 - 204

BIOAVAILABILITY ENHANCEMENT USING NOVEL DRUG DELIVERY SYSTEM

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Abstract:
Bioavailability is an important pharmacokinetic parameter that refers to the rate and extent to which a drug reaches the systemic circulation. Many drugs show poor bioavailability due to low solubility, poor permeability, and extensive first-pass metabolism. This can reduce the therapeutic effectiveness of the drug. To overcome these limitations, various novel drug delivery systems (NDDS) have been developed to enhance drug solubility, stability, and absorption. Novel approaches such as nanoparticles, liposomes, nanoemulsions, solid dispersions, and polymeric drug delivery systems are widely used to improve the bioavailability of poorly soluble drugs. These systems increase the surface area of the drug, enhance dissolution rate, and promote better absorption in the gastrointestinal tract. As a result, they improve therapeutic efficiency and reduce the required dosage and side effects. This project focuses on the concept of bioavailability enhancement using novel drug delivery systems and highlights the importance of advanced formulation techniques in improving drug delivery and pharmacokinetic performance.

keyword:
Bioavailability,Novel Drug Delivery Systems (NDDS),Drug Absorption,Solubility enhance ment ,Nanoparticles, Liposomes, Nanoemulsion, SolidDispersion, Pharmacokinetics, Drug Delivery Systems

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APP ABSTRACT - APP 2026 - 205

FORMULATION AND EVALUATION OF AN ANTI-INFLAMMATORY GEL CONTAINING *SEMECARPUS ANACARDIUM* LINN. F LEAF EXTRACT

Authors: Manikkan Ruby, Assistant Professor, Department of Pharmacognosy and Phytochemistry, Elims College of Pharmacy, Ramavarmapuram, Thrissur 680588

Abstract

Semecarpus anacardium is a plant traditionally used for managing inflammation and pain. This research aimed to design, formulate, and evaluate a novel ethosome-loaded anti-inflammatory gel using *Semecarpus anacardium* leaf extract to offer a safer, plant-based alternative for topical use.Leaves of *Semecarpus anacardium* were authenticated and subjected to successive solvent extraction, with the ethanolic extract yielding the highest concentration of active constituents (13.13% w/w). The *in vitro* anti-inflammatory potential was assessed using the albumin denaturation assay. To enhance topical delivery, the extract was encapsulated into ethosomes via the cold method and formulated into a gel through the dispersion method. The formulation was evaluated *in vivo* using a carrageenan-induced paw edema model on Wistar rats, alongside an acute dermal toxicity study conducted per OECD guidelines 402.Phytochemical analysis of the ethanolic extract confirmed the rich presence of flavonoids and phenols, key bioactive compounds known for anti-inflammatory efficacy. The optimized ethosomal formulation (F3) demonstrated a highly efficient drug entrapment of 89.58 ± 0.26%. Acute dermal toxicity testing confirmed the gel formulation is completely safe and non-irritating up to a maximum dose of 2000 mg/kg. Furthermore, the *in vivo* assessment showed that the 400 mg/kg ethosomal gel produced a highly significant reduction in carrageenan-induced inflammation ($p < 0.0001$), exhibiting therapeutic efficacy comparable to the standard drug, Diclofenac sodium.The successful formulation of the *Semecarpus anacardium* ethosomal gel provides a highly stable, non-toxic, and therapeutically effective natural treatment for inflammatory skin conditions.

Keywords: Anti-inflammatory, Carrageenan, *Semecarpus anacardium*, Herbal, Ethosomes .

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APP ABSTRACT - APP 2026 - 206

PHARMACOKINETIC IMPACT OF TARGETED NANOCARRIERS IN MODERN DRUG DELIVERY SYSTEMS

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ABSTRACT:

Drug delivery plays a crucial role in determining the therapeutic effectiveness of pharmaceutical agents. Conventional drug delivery systems often face several limitations such as poor bioavailability, rapid metabolism, non-specific distribution, and increased risk of adverse effects. These challenges can reduce therapeutic outcomes and require frequent dosing, which may decrease patient compliance. To overcome these limitations, targeted nanocarriers have emerged as an advanced strategy in modern drug delivery systems.Targeted nanocarriers are nanoscale drug delivery vehicles designed to deliver therapeutic agents directly to specific tissues or cells. These systems include nanoparticles, liposomes, dendrimers, and polymeric nanocarriers that can encapsulate drugs and protect them from premature degradation in the biological environment. By improving the stability and solubility of drugs, nanocarriers enhance the pharmacokinetic behaviour of therapeutic molecules.Several studies have demonstrated that targeted nanocarriers significantly influence pharmacokinetic parameters such as absorption, distribution, metabolism, and elimination. These carriers improve membrane permeability, prolong systemic circulation time, and enable controlled or sustained drug release. Additionally, targeted delivery allows higher drug accumulation at the disease site while minimizing exposure to healthy tissues, thereby reducing systemic toxicity.Overall, targeted nanocarriers represent a major advancement in modern pharmaceutical technology. Their ability to improve pharmacokinetic properties and enhance therapeutic efficacy offers significant potential for the development of safer and more effective drug delivery systems in the future.

Key words: targeted nanocarriers, pharmacokinetics, drug delivery systems, nanoparticles.

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APP ABSTRACT - APP 2026 - 207

BIOAVAILABILITY ENHANCEMENT

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Abstract:

Bioavailability is the rate at which a drug is absorbed by the body and becomes available where it is needed. Many drugs do not get absorbed well because they do not dissolve easily or they get broken down quickly. This is why it is so important for people who make drugs to figure out ways to make them get absorbed better. If a drug gets absorbed better it will work better. People will not have to take it as often. There are a ways to make drugs get absorbed better. One way is to make the particles of the drug smaller so they can dissolve easily. Anotherway is to mix the drug with things that help it dissolve.Using particles to deliver the drug, Putting the drug in a kind of fat that helps it get absorbed, Using a kind of molecule that helps protect the drug from getting broken down Some drugs can be changed to make them get absorbed better. There are also helpers like piperine that can make drugs get absorbed better by stopping the body from breaking them down too quickly. New technologies are being developed to help make drugs get absorbed better. This is especially important for drugs that do not dissolve easily. The best way to make a drug get absorbed better depends on what the drug's made of and what it is supposed to do. People are always doing research to find ways to make drugs get absorbed better. This helps make drugs that work better and are easier for people to take. Bioavailability is very important, for making sure drugs work well.

keywords

Bioavailability, Drug absorption, Solubility enhancement, Drug delivery systems,Nanoparticles, Solid dispersion, Lipid-based formulations, Prodrug approach, Pharmaceutical formulation, Therapeutic efficacy.

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APP ABSTRACT - APP 2026 - 208

ROLE OF NANOMEDICINE IN THE TREATMENT OF ATHEROSCLEROSIS

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Abstract

Nanotechnology-based drug delivery systems (DDS) such as micelles, liposomes, polymeric nanoparticles, dendrimers, and carbon nanotubes are increasingly used in modern medicine to treat cardiovascular diseases. These Nano-DDS improve drug distribution in the body by modifying drug kinetics and enabling passive targeting through mechanisms like reduced excretion and increased vascular permeability. This approach is particularly useful in inflammatory diseases like Atherosclerosis, where inflammatory monocytes and macrophages contribute to plaque instability that can lead to Acute Myocardial Infarction. Studies using polymeric nanoparticles carrying Pioglitazone showed reduced inflammatory monocytes, increased anti-inflammatory monocytes, and activation of protective macrophage genes, ultimately stabilizing atherosclerotic plaques. Thus, Nano -DDS offers a promising strategy to prevent serious cardiovascular events by controlling inflammation.Nanotechnology-based drug delivery systems offer a promising strategy for improving the treatment of cardiovascular diseases. By enhancing targeted drug delivery and modulating inflammatory responses, Nano-DDS can effectively reduce the progression and instability of plaques associated with Atherosclerosis. The use of polymeric nanoparticles carrying Pioglitazone has demonstrated the ability to regulate inflammatory monocytes and macrophages, promoting plaque stabilization. Therefore, Nano-DDS represent a potential therapeutic approach for preventing severe cardiovascular events such as Acute Myocardial Infarction and improving overall cardiovascular health.

Key words:

Drug Delivery Systems (DDS Polymeric Nanoparticles, Micelles, Liposomes, Dendrimers, Carbon Nanotubes, Passive Targeting, Inflammation, Atherosclerosis, Monocytes, Macrophages, Plaque Stabilization, Pioglitazone, Nanomedicine, Cardiovascular Therapy, Acute Myocardial Infarction.

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APP ABSTRACT - APP 2026 - 209

EXOSOME-BASED DRUG DELIVERY SYSTEMS: A NEXT-GENERATION STRATEGY FOR TARGETED THERAPEUTICS

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Abstract:

Targeted drug delivery remains a major challenge in modern therapeutics due to issues such as poor drug bioavailability, systemic toxicity, and lack of tissue specificity. Recently, exosomes have emerged as promising natural nanocarriers for efficient drug delivery. Exosomes are nano-sized extracellular vesicles (30–150 nm) secreted by various cell types and play a crucial role in intercellular communication by transporting proteins, lipids, and nucleic acids. Their unique biological properties, including high biocompatibility, low immunogenicity, and intrinsic targeting ability, make them attractive candidates for advanced drug delivery systems. Exosome-based delivery platforms have demonstrated significant potential in improving the therapeutic efficacy of drugs, particularly in the treatment of complex diseases such as cancer, Alzheimer's disease, and Parkinson's disease. These vesicles can be engineered to encapsulate a wide range of therapeutic agents, including small molecule drugs, RNA therapeutics, and proteins. Additionally, their ability to cross biological barriers, such as the blood–brain barrier, offers a unique advantage for treating neurological disorders.Recent advances in biotechnology have enabled the development of modified or engineered exosomes with improved targeting efficiency and drug loading capacity. Despite promising , challenges such as large-scale production, purification, and standardization remain critical for clinical translation. Overall, exosome-based drug delivery represents a cutting-edge approach with the potential to revolutionize precision medicine and future therapeutic strategies.

Keywords: Exosomes; Targeted Drug Delivery; Nanomedicine; Precision Medicine.

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APP ABSTRACT - APP 2026 - 210

BIOACTIVES AND METAL NANOPARTICLE HYBRID NANOSTRUCTURES: A NOVEL APPROACH TO FIGHTING ANTIMICROBIAL RESISTANCE

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Abstract

The emergence of multidrug-resistant (MDR) pathogens has necessitated the development of innovative antimicrobial strategies beyond conventional antibiotics. In this context, the synthesis of bioactive compound-capped metal nanoparticles (MNPs) has gained significant attention as a rational and effective approach to enhance antimicrobial efficacy. Bioactive molecules, including phytochemicals, peptides, and antibiotics, possess inherent biological activities, while metal nanoparticles such as silver, zinc oxide, and copper exhibit unique physicochemical properties, including high surface reactivity, reactive oxygen species (ROS) generation, and enhanced membrane permeability. The integration of bioactive compounds with MNPs in hybrid nanostructures that demonstrate synergistic mechanisms of action. These include improved cellular uptake, targeted disruption of microbial membranes, increased oxidative stress, and interference with essential metabolic and genetic processes. Surface functionalization of MNPs further enhances their stability, biocompatibility, and controlled drug release, thereby enabling reduced effective dosages and minimizing potential toxicity. Recent studies highlight that these hybrid nanomedicines exhibit superior antimicrobial performance compared to their individual components. They show broad-spectrum activity against Gram-positive and Gram-negative bacteria, as well as effectiveness against biofilms and drug-resistant strains. Such multifunctional systems also offer advantages in overcoming resistance mechanisms due to their multitarget mode of action. Bioactive compounds emphasizes their role as a promising multitarget antimicrobial strategy with significant potential in therapeutic, biomedical, and environmental applications, paving the way for next-generation antimicrobial interventions\

KEYWORD: multidrug-resistant, reactive oxygen species, phytochemicals

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APP ABSTRACT - APP 2026 - 211

EXOSOMES AS INNOVATIVE NANOCARRIERS FOR TARGETED AND PERSONALIZED DRUG DELIVERY

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Abstract

To evaluate the potential of exosomes as next-generation drug delivery systems, focusing on their biological characteristics, targeting efficiency, and therapeutic applications in improving drug delivery outcomes.A comprehensive review of recent literature was conducted to analyze the structure, biogenesis, and functional properties of exosomes. Various drug loading techniques, including passive incubation, electroporation, and surface engineering, were assessed along with their efficiency in delivering therapeutic agents. Comparative analysis with conventional nanocarriers was also performed to highlight advantages.Exosomes, nanosized extracellular vesicles (30–150 nm), demonstrated superior biocompatibility, low immunogenicity, and enhanced stability in systemic circulation. Their inherent ability to cross biological barriers, such as the blood-brain barrier, and deliver drugs with high specificity resulted in improved therapeutic efficacy and reduced adverse effects. Studies indicated successful application of exosomes in cancer therapy, gene delivery, and neurological disorders, with better targeting efficiency compared to synthetic delivery systems.Exosomes represent a promising and innovative platform for targeted and personalized drug delivery. Their natural origin and unique biological properties offer significant advantages over conventional systems. However, challenges such as large-scale production, purification, and regulatory standardization must be addressed to enable widespread clinical application.

Keywords:

Exosomes, Drug Delivery Systems, Nanocarriers, Targeted Therapy, Personalized Medicine.

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APP ABSTRACT - APP 2026 - 212

NANOTECHNOLOGY-BASED DRUG DELIVERY SYSTEMS FOR IMPROVING SOLUBILITY AND BIOAVAILABILITY OF POORLY SOLUBLE DRUGS

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Nanotechnology has been recognized as a promising tool to address the issues of solubility and bioavailability of poorly soluble drugs, especially BCS Class II and Class IV drugs. Poor aqueous solubility can act as a barrier to the absorption of the drug, thus affecting its therapeutic efficacy. In the present study, different nanoscale drug delivery systems (NDDS) have been explored to overcome the problems associated with poorly soluble drugs. These include lipid-based nanocarriers, polymeric nanoparticles, Nano emulsions, nanogels, and inorganic nanocarriers. These nanoscale drug delivery systems have been shown to improve the solubility, stability, and absorption of the drug, thus improving therapeutic efficacy while reducing adverse effects. Emphasis was given to the role of nanoparticle size, surface modification, and their importance in improving the efficiency of drug delivery. Optimizing all the parameters can help in achieving targeted drug delivery, thus improving therapeutic efficacy. Recent advancements in nanotechnology have greatly contributed to the development of efficient drug delivery systems for poorly soluble drugs. Certain limitations, including high production costs and potential hazards, also need to be taken into consideration. Nanotechnology can thus be regarded as a promising and innovative tool in pharmaceutical engineering, providing new avenues in drug delivery systems.

Keywords: Nanotechnology; NDDS; Poorly soluble drugs; Bioavailability; Solubility; Targeted drug delivery; Nanocarriers; Pharmaceutical engineering.

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APP ABSTRACT - APP 2026 - 213

COMPARATIVE EVALUATION OF TOLPERISONE + DICLOFENAC AND DIAZEPAM + DICLOFENAC IN THE MANAGEMENT OF ACUTE LUMBOSACRAL SPRAIN

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Abstract

Objective: Acute lumbosacral sprain is a common musculoskeletal condition associated with pain, inflammation, and muscle spasm, leading to reduced functional mobility. Muscle relaxants in combination with NSAIDs are widely used for its management. This study aims to compare the efficacy and safety of Tolperisone + Diclofenac versus Diazepam + Diclofenac in the treatment of acute lumbosacral sprain from a pharmacy practice perspective.A prospective comparative study was conducted among patients diagnosed with acute lumbosacral sprain. Patients were divided into two groups: Group A received Tolperisone with Diclofenac, and Group B received Diazepam with Diclofenac. Clinical evaluation was carried out over a period of 5–7 days using pain assessment scales (Visual Analog Scale), degree of muscle spasm, and improvement in functional mobility. Adverse drug reactions such as sedation, dizziness, and gastrointestinal disturbances were monitored.Both treatment groups showed significant reduction in pain and muscle spasm. However, the Tolperisone + Diclofenac group demonstrated comparable efficacy with a lower incidence of sedation and better tolerability. In contrast, patients receiving Diazepam + Diclofenac reported higher levels of drowsiness, which affected daily activities and compliance.Tolperisone combined with Diclofenac is as effective as Diazepam + Diclofenac in managing acute lumbosacral sprain, with the added advantage of fewer sedative side effects. From a pharmacy practice perspective, Tolperisone-based therapy supports rational drug use and improves patient compliance and safety.

Keywords: Acute lumbosacral sprain, Tolperisone, Diazepam, Diclofenac, Pharmacy practice, Muscle relaxants, Rational drug therapy.

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APP ABSTRACT - APP 2026 - 214

NOVEL : ANTIVIRAL DRUGS

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ABSTRACT

The emergence of new viral pathogens and the increasing resistance of existing viruses to conventional therapies has accelerated the development of novel antiviral drugs. Recent advances in virology, molecular biology, and drug design have facilitated the discovery of targeted agents that inhibit viral replication with greater specificity and reduced toxicity. Novel antivirals include small-molecule inhibitors, monoclonal antibodies, nucleic acid-based therapies, and host-targeted drugs. Small-molecule inhibitors are designed to block viral enzymes such as polymerases, proteases, and integrases, effectively halting replication. Monoclonal antibodies offer high specificity by neutralizing viral particles or modulating host immune responses. RNA interference (RNAi) and antisense oligonucleotides represent nucleic acid-based approaches that suppress viral gene expression at the transcriptional or translational level. Host-targeted therapies aim to interfere with cellular pathways exploited by viruses, reducing the likelihood of resistance. Clinically, several novel antivirals have shown promise against emerging pathogens such as SARS-CoV-2, respiratory syncytial virus (RSV), Ebola virus, and hepatitis viruses. These drugs have demonstrated improved efficacy, reduced adverse effects, and broader spectrum activity compared to traditional antivirals. Despite these advances, challenges remain in optimizing delivery methods, minimizing off-target effects, and addressing rapid viral mutation. Continued research is essential to expand the antiviral arsenal, particularly for zoonotic viruses and drug-resistant strains. This review highlights current trends in antiviral drug development, elucidates mechanisms of action, and evaluates recent clinical outcomes, providing insights into future directions for combating viral diseases

Keywords : Novel antivirals, including small-molecule inhibitors, monoclonal antibodies,

and RNAi, target emerging viruses like SARS-CoV-2 and address drug resistance

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APP ABSTRACT - APP 2026 - 215

MACHINE LEARNING APPROACH IN SOLUBILITY ENHANCEMENT OF DEXTROMETHORPHAN SYRUP USING MOLECULAR DESCRIPTOR

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Abstract

Dextromethorphan is a commonly prescribed antitussive agent; however, its therapeutic effectiveness can be limited by physicochemical constraints such as moderate aqueous solubility and inconsistent dissolution behavior. Enhancing its solubility is therefore essential to improve bioavailability and formulation performance. The present study focuses on improving the solubility profile of dextromethorphan using a molecular descriptor based computational approach integrated with Machine Learning (ML) tools. A comprehensive set of molecular descriptors—including topological indices, hydrogen bond donor and acceptor counts, logP, polar surface area, molecular flexibility, and relevant electronic parameters were generated to characterize the molecule. These descriptors served as input variables for building predictive ML models. An Artificial Neural Network (ANN) model was developed to establish quantitative relationships between molecular features and solubility outcomes. The optimized ANN model demonstrated high predictive performance and successfully identified critical structural attributes influencing solubility enhancement. This ML-guided strategy minimized the need for extensive experimental screening and facilitated rational, targeted formulation development aimed at improving aqueous solubility and dissolution rate. Overall, the study underscores the potential of data-driven molecular modeling and artificial intelligence tools in modern pharmaceutical formulation design and offers a scalable approach for addressing solubility challenges of poorly water-soluble drugs.

Keywords:

Dextromethorphan, Solubility Enhancement, Molecular Descriptors, Artificial Neural Network, Machine Learning.

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APP ABSTRACT - APP 2026 - 216

NANOCRYSTALS: A REVOLUTIONARY APPROACH TO ENHANCE BIOAVAILABILITY OF POORLY SOLUBLE DRUGS

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Poor aqueous solubility limits the bioavailability of many drugs, especially BCS Class II and IV compounds. This in poor dissolution, reduced absorption, and decreased therapeutic efficacy. Nanocrystal technology has emerged as an effective approach to overcome these limitations.To evaluate the role of nanocrystals in enhancing bioavailability and compare them with conventional drug delivery systems.A descriptive review of nanocrystal preparation techniques, including top-down and bottom-up methods, was conducted. The effect of particle size reduction on drug dissolution and absorption was analyzed.Nanocrystals improve dissolution rate by increasing surface area and saturation solubility, leading to enhanced bioavailability and faster onset of action. They also improve stability and reduce variability in drug absorption. Several marketed products support their effectiveness.Nanocrystal technology is a promising strategy to enhance the bioavailability of poorly soluble drugs and plays an important role in modern drug development.

Keywords

Nanocrystals; Bioavailability Enhancement; Poorly Soluble Drugs; Nanotechnology; Drug Delivery Systems

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APP ABSTRACT - APP 2026 - 217

NANOTECHNOLOGY APPROACHES TO CROSSING THE BBB AND DRUG DELIVERY TO THE CNS

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Abstract:

Nanotechnology as emerged as a promising approach in overcoming the limitations of conventional drug delivery to the central nervous system (CNS). The presence of the Blood–Brain Barrier restricts the entry of most therapeutic agents into the brain, posing a significant challenge in the treatment of neurological disorders and brain tumors. This study highlights the role of nanotechnology-based delivery systems in enhancing drug transport across the BBB.Various nanocarriers, including polymeric nanoparticles, liposomes, solid lipid nanoparticles, and nanogels, have been explored for their ability to encapsulate drugs and protect them from degradation. Surface-modified nanoparticles, such as polysorbate-80 coated systems, facilitate receptor-mediated endocytosis, enabling efficient brain targeting. These nanodevices not only improve drug bioavailability but also allow controlled and sustained release at the target site.Additionally, nanotechnology plays a crucial role in the delivery of macromolecules such as peptides and oligonucleotides, which otherwise cannot cross the BBB. Studies have demonstrated significantly enhanced drug accumulation in brain tissues and improved therapeutic outcomes, particularly in conditions such as brain tumors and neurodegenerative diseases.In , nanotechnology-based drug delivery systems represent a transformative strategy for CNS therapeutics by enabling targeted, efficient, and minimally invasive treatment. Despite existing challenges related to safety and scalability, ongoing research continues to advance their clinical potential.

Keywords: Drug delivery system, BBB , Polymeric nanocarriers, CNS, Obligonucleotides, Nanogels, Liposomes.

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APP ABSTRACT - APP 2026 - 218

ACUTE KIDNEY INJURY SECONDARY TO NEPHRTOXIC DRUGS: A CLINICAL OVERVIEW

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Abstract

Acute Kidney Injury (AKI) is a sudden decline in renal function characterized by an increase in serum creatinine and/or reduction in urine output. Drug-induced AKI is a significant and preventable cause of morbidity and mortality, especially among hospitalized patients. A wide range of medications—including nonsteroidal anti-inflammatory drugs (NSAIDs), antibiotics such as aminoglycosides, radiographic contrast agents, diuretics, and certain chemotherapeutic drugs—are known to impair renal function through various mechanisms.The pathophysiology of drug-induced AKI primarily involves hemodynamic alterations, direct tubular toxicity, interstitial nephritis, and crystal-induced obstruction. Risk factors include advanced age, pre-existing renal impairment, dehydration, polypharmacy, and comorbid conditions such as diabetes and hypertension. Clinical presentation may range from asymptomatic biochemical changes to severe complications like oliguria, electrolyte imbalance, and uremia.Early identification through monitoring of renal parameters, along with prompt discontinuation or dose adjustment of the offending drug, is crucial in preventing progression. Management strategies focus on supportive care, optimization of fluid balance, and in severe cases, renal replacement therapy. Preventive measures such as appropriate drug selection, dose modification based on renal function, and therapeutic drug monitoring play a vital role.In , drug-induced AKI remains a critical clinical concern, emphasizing the importance of rational drug use and vigilant monitoring to minimize renal complications and improve patient outcomes.

Key words: Acute Kidney Injury, Oliguria, uremia, Aminoglycosides

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APP ABSTRACT - APP 2026 - 219

Influenza Virus: Evolution, Pandemics, and Modern Therapeutic Strategies

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Abstract:

Influenza is a highly contagious viral respiratory disease caused mainly by influenza A and B viruses, which undergo frequent antigenic changes leading to seasonal epidemics and occasional pandemics. It spreads through respiratory droplets and presents with symptoms such as fever, cough, myalgia and respiratory complications, particularly in high-risk groups like children and the elderly. Vaccination remains the most effective prevention measure, while antiviral drugs such as Neuraminidase inhibitors are used for treatment and prophylaxis. However, high mutation rates and antiviral resistance continue to challenge control efforts. Recent advances in Neuraminidase-based vaccine strategies offer promising prospects for broader and longer-lasting protection against diverse influenza strains.

Key Words:

Influenza, Hemagglutinin, Neuraminidase, Oseltamivir, Zanamivir, Trivalent Inactivated Vaccines (TIV), Morbidity, Mortality, Surveillance, Pandemics.

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APP ABSTRACT - APP 2026 - 220

LIPOSOMAL AND NANOPARTICLE DRUG DELIVERY SYSTEMS FOR IMPROVING ANTIBIOTIC BIOAVAILABILITY IN RESISTANT BACTERIAL INFECTIONS

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ABSTRACT:

Antimicrobial resistance (AMR) has become a major global healthcare challenge, significantly reducing the effectiveness of conventional antibiotic therapies. Resistant pathogens such as Staphylococcus aureus (including methicillin-resistant strains), Escherichia coli, Klebsiella pneumoniae, and Acinetobacter baumannii are increasingly difficult to treat due to mechanisms like enzymatic drug degradation, efflux pumps, and biofilm formation. A key factor contributing to therapeutic failure is the poor bioavailability and limited tissue penetration of many antibiotics. Recent advances in nanotechnology have introduced innovative drug delivery systems, particularly liposomes and nanoparticles, as promising strategies to overcome these limitations. Liposomes are phospholipid-based vesicles capable of encapsulating both hydrophilic and lipophilic drugs, thereby protecting antibiotics from degradation and enhancing targeted delivery to infection sites. Similarly, polymeric and lipid-based nanoparticles provide controlled and sustained drug release, improve drug stability, and enhance permeability across biological membranes. Encapsulation of antibiotics such as ciprofloxacin, amikacin, and vancomycin into these nanocarriers has demonstrated enhanced antibacterial activity against resistant strains, including methicillin-resistant Staphylococcus aureus. These systems improve drug accumulation at infection sites, facilitate targeted therapy, and increase overall therapeutic efficacy. Additionally, they have shown the ability to disrupt bacterial biofilms and reduce systemic toxicity compared to conventional formulations.

Overall, nanotechnology-based antibiotic delivery systems represent a promising approach to combat antimicrobial resistance by enhancing drug bioavailability, improving antibacterial action, and achieving better clinical outcomes.

Keywords: Antimicrobial resistance, Nanotechnology, Liposomes, Nanoparticles, Bioavailability, Targeted drug delivery, Antibiotic resistance, Biofilms, Controlled release, Drug delivery systems.

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APP ABSTRACT - APP 2026 - 221

DATOPOTAMAB DERUXTECAN: A TARGETED THERAPY FOR CANCER USING ANTIBODY–DRUG CONJUGATES"

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Abstract

Cancer treatment has advanced significantly with the development of targeted therapies. One such innovation is Datopotamab Deruxtecan (Dato-DXd), a novel antibody–drug conjugate (ADC) designed to treat cancers that express the TROP2 protein. TROP2 is commonly found in various epithelial tumors and is associated with poor prognosis, making it an important target for therapy.Dato-DXd works by combining a monoclonal antibody that specifically binds to TROP2 with a potent anticancer drug (a topoisomerase I inhibitor). Once the drug binds to cancer cells, it is internalized and releases its cytotoxic payload inside the cell. This leads to DNA damage and eventually causes cancer cell death (apoptosis). Additionally, the released drug can affect nearby tumor cells, enhancing its therapeutic effect.Preclinical studies have shown that Dato-DXd has strong antitumor activity in different cancer models, especially in tumors with high TROP2 expression such as lung and breast cancers. It demonstrated significant tumor regression with minimal effects on normal cells. Safety studies in animal models indicated acceptable toxicity profiles, although some side effects like mild tissue damage were observed at higher doses.Overall, Datopotamab Deruxtecan represents a promising targeted therapy with improved drug delivery and reduced systemic toxicity. It offers potential benefits over conventional chemotherapy and could become an effective treatment option for patients with TROP2-expressing cancers.

Keywords: Antibody-drug conjugate, TROP2, Targeted cancer therapy, Apoptosis, Xenograft models, Antitumor activity.

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APP ABSTRACT - APP 2026 - 222

AI APPLICATIONS IN DRUG DISCOVERY

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ABSTRACT

The integration of Artificial Intelligence (AI) in medicine, particularly throughMachine Learning (ML), has significantly advanced drug discovery. AI acts as catalyst, narrowing the gap between understanding diseases and identifying potential therapeutic agents. This review provides an overview of AI's role in various stages of drug discovery, including disease identification, target identification, screening, and lead discovery.AI's capability to analyze extensive datasets and discern patterns is crucial in these stages, enhancing predictions and efficiencies in disease identification, drug discovery,and clinical trial management. By leveraging AI, researchers can expedite drug development, reducing time and costs associated with introducing new drugs to the market.However, AI's effectiveness depends on data quality, algorithm training, and ethical considerations, particularly in handling patient data during clinical trials. Addressing these factors is essential to harness AI's potential in transforming drugdevelopment.By doing so, AI can offer significant benefits to patients and society, revolutionizing the field of medicine. The future of AI in drug discovery holds immense promise, and its continued development is likely to have a profound impact on healthcare.The review highlights AI's transformative role in drug discovery, emphasizing its potential to analyze vast data volumes, reduce costs, and improve patient outcomes. AsAI technology advances, its applications in medicine are expected to expand, leading to breakthroughs in disease treatment and management.

Keywords: Artificial intelligence, Drug discovery,Machine learning, Healthcare, Medicine

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APP ABSTRACT - APP 2026 - 223

Rewriting Autism at the Genetic Level : Emerging Gene therapy strategies Transforming Autism spectrum Disorder Treatment – A Collective Review

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Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition marked by repetitive behaviors and social communication challenges. While traditional treatments like behavioral therapy and antipsychotics manage symptoms such as irritability and hyperactivity, they do not address the underlying biological causes. Recent genomic research has identified mutations in genes responsible for synaptic development and neuronal signaling—such as SHANK3, MECP2, FMR1, and CNTNAP2—as primary drivers of the disorder. The review examines the application of three innovative molecular pillars designed to target these genetic roots: Viral Vector-Mediated Gene Delivery: Utilizing engineered adeno-associated viruses (AAVs), specifically serotypes like AAV9, to deliver functional "replacement" copies of genes across the blood-brain barrier. CRISPR-Cas9 Genome Editing: Acting as "molecular scissors," this complex uses a guide RNA to physically cut and permanently repair DNA mutations or reactivate silenced genes. Antisense Oligonucleotides (ASOs): Functioning as a "genetic dimmer switch," these synthetic strands target mRNA to silence faulty genes or modify protein splicing without permanently changing the host genome.Experimental applications in genetically modified mouse models have demonstrated significant success. By correcting or reactivating critical ASD-related genes, researchers observed: Improved synaptic communication between neurons. Restoration of neuronal network function. A measurable reduction in autism-like behavioral abnormalities. The potential for long-lasting, disease-modifying outcomes rather than lifelong symptom management. Gene therapy represents a paradigm shift toward precision medicine for ASD. While the potential for reversing core deficits is high, significant hurdles remain, including ensuring the safety of brain-wide delivery and minimizing off-target genetic effects. Future progress depends on advancing early genetic diagnosis and conducting rigorous clinical trials to transition these "molecular tools" into standard clinical practice.

Keywords: Autism Spectrum Disorder, Genome Editing, Antisense Oligonucleotide Therapies, Viral Vector-Mediated Delivery

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APP ABSTRACT - APP 2026 - 224

NETWORK PHARMACOLOGY–DRIVEN IN SILICO INVESTIGATION OF FLAVONOIDS AS MULTI-TARGET PHYTOCONSTITUENTS FOR ALZHEIMER'S DISEASE

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ABSTRACT

Alzheimer's disease (AD) is a progressive neuro degenerative disorder characterized by amyloid-β aggregation, tau hyper-phosphorylation, oxidative stress, synaptic dysfunction, and neuroinflammation. Owing to its multi-factorial pathogenesis, single-target therapies have demonstrated limited efficacy. Flavonoids, a class of plant-derived polyphenolic compounds, exhibit antioxidant, anti-inflammatory, and neuroprotective activities, making them promising candidates for multi-target therapeutic intervention in AD.To investigate the multi-target therapeutic potential and underlying molecular mechanisms of flavonoids in Alzheimer's disease using a network pharmacology–driven in silico approach.Selected flavonoids were screened based on pharmacokinetic parameters and drug-likeness properties. Putative targets of flavonoids were retrieved from publicly available databases and intersected with AD-associated genes to identify common targets. A protein–protein interaction (PPI) network was constructed to determine key hub genes. Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway enrichment analyses were performed to elucidate relevant biological processes and signaling pathways. Network analysis identified critical targets involved in amyloid processing, tau pathology, neuroinflammation, apoptosis, and oxidative stress. Enrichment analysis revealed significant modulation of pathways such as PI3K-Akt and MAPK signaling pathways. Molecular docking demonstrated strong binding affinities between selected flavonoids and key AD-associated targets, supporting their potential as multi-target therapeutic agents.The integrative network pharmacology and molecular docking analysis suggests that flavonoids possess significant multi-target therapeutic potential against Alzheimer's disease. These findings provide a computational foundation for further experimental validation and development of flavonoid-based interventions for AD management.

Keywords: Alzheimer's disease; Flavonoids; Network pharmacology; Molecular docking; Multi-target therapy; Phytoconstituents; In silico analysis; Neuroprotection

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APP ABSTRACT - APP 2026 - 225

NANOTECHNOLOGY IN DRUG DELIVERY: REVOLUTIONIZING THERAPEUTIC OUTCOMES THROUGH TARGETED AND CONTROLLED RELEASE SYSTEMS

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Abstract

Conventional drug delivery systems often face limitations such as poor bioavailability, lack of target specificity,rapid degradation, and increased risk of systemic side effects. These challenges can reduce therapeutic efficacy and negatively impact patient outcomes, particularly in chronic and complex diseases. Nanotechnology has emerged as an innovative approach to overcome these barriers by enabling targeted and controlled drug delivery.Nanotechnology-based drug delivery systems utilize nanoscale carriers, typically ranging from 1 to 100 nanometres, to deliver drugs more effectively to specific sites of action. Various nanocarriers, including liposomes, polymeric nanoparticles, dendrimers, and solid lipid nanoparticles, are designed to enhance drug solubility, stability, and bioavailability. Surface modification techniques, such as ligand attachment, allow these carriers to selectively target diseased tissues, thereby minimizing off-target effects and reducing toxicity.A key advantage of nanotechnology is its ability to improve pharmacokinetic and pharmacodynamic profiles of drugs. In cancer therapy, nanocarriers enable targeted delivery of chemotherapeutic agents, increasing drug concentration at tumour sites while sparing healthy tissues. Additionally, nanotechnology facilitates drug delivery across biological barriers, such as the blood–brain barrier, expanding treatment options for central nervous system disorders. Applications also extend to infectious diseases and gene therapy.Despite its potential, challenges such as high production costs, scalability issues, and safety concerns remain. Nevertheless, nanotechnology holds significant promise in enhancing therapeutic outcomes and advancing modern pharmacotherapy.

Keywords: Nanotechnology, nanometres, Nanotechnology-based drug delivery systems, tumour sites, nanocarriers, pharmacokinetic and pharmacodynamic

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APP ABSTRACT - APP 2026 - 226

ULTRASOUND-RESPONSIVE ACOUSTIC NANOPARTICLES FOR TARGETED DRUG DELIVERY: A NOVEL THERAPEUTIC APPROACH

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ABSTRACT

Conventional drug delivery systems often lack site specificity, resulting in systemic toxicity and reduced therapeutic efficacy. Ultrasound-responsive acoustic nanoparticles have emerged as a novel strategy for achieving controlled and targeted drug delivery. These nanocarriers utilize externally applied ultrasound
waves to trigger drug release at specific sites, offering a non-invasive and highly precise therapeutic approach. This study aims to explore the design, mechanism, and pharmaceutical applications of acoustic nanoparticles in advanced drug delivery systems. A comprehensive review of recent literature (2020–2025) was conducted focusing on ultrasound-responsive nanocarriers, including lipid-based nanoparticles, polymeric systems, and microbubble-assisted delivery platforms. Mechanisms such as acoustic cavitation, thermal effects, and mechanical stress induced by ultrasound were analyzed. Preparation techniques, drug loading efficiency, and characterization parameters were also evaluated. Ultrasound-responsive nanoparticles demonstrated enhanced drug targeting, controlled release, and improved therapeutic outcomes. Cavitation effects facilitated increased permeability and drug penetration at the target site. These systems significantly reduced off-target effects and allowed spatiotemporal control of drug release. Applications in cancer therapy, gene delivery, and blood-brain barrier transport showed promising . Ultrasound-responsive acoustic nanoparticles represent a cutting-edge advancement in nanomedicine, offering precise, controlled, and non-invasive drug delivery. Their ability to enhance therapeutic efficacy while minimizing adverse effects makes them a promising tool in modern pharmaceutical sciences and future precision medicine.

Keywords:
Ultrasound-responsive nanoparticles, Acoustic nanocarriers, Targeted drug delivery, Cavitation, Controlled drug release, Nanomedicine, Stimuli-responsive systems, Drug targeting, Precision medicine

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APP ABSTRACT - APP 2026 - 227

ADVANCING POORLY SOLUBLE DRUG DELIVERY: NANOTECHNOLOGY STRATEGIES AND NANOMORPH TECHNOLOGY

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Abstract

Poor aqueous solubility remains a critical barrier in pharmaceutical development, affecting bioavailability and therapeutic efficacy of numerous drug candidates. Nanotechnology emerges as a transformative approach, utilizing nanoparticles (1-1000 nm) to dramatically enhance dissolution rates and saturation solubility via increased surface area. This review synthesizes key nanoparticle production techniques, including wet milling, high-pressure homogenization, emulsification, and precipitation methods like PCA, RESS, SFL, and EPAS, which convert coarse crystalline drugs into stable nanosuspensions or amorphous forms.Among commercialized platforms, Nanomorph technology stands out for its precipitation-based conversion of poorly soluble drugs into amorphous nanoparticles using water-miscible solvents and polymer stabilizers. This process prevents aggregation, yielding redispersible powders suitable for diverse dosage forms, including orals and injectables. Compared to traditional methods, Nanomorph offers superior stability without Ostwald ripening, as evidenced by enhanced bioavailability in models like danazol (from 5.2% to 82.3%). Other innovations such as Dissocubes, Nanocrystal, Nanoedge, Nanopure, Crititech, and Nanocochleate further exemplify nanotechnology's versatility, bypassing chemical modifications' drawbacks like cost and toxicity risks.Challenges include contamination risks in milling and crystallinity variations in homogenization, yet these technologies enable high drug loading and long-term stability. As pharmaceutical industries pivot toward nanoformulations, they revive abandoned compounds and support precision medicine. Future directions emphasize scalable, aseptic processes for parenteral use, positioning nanotechnology as the gold standard for solubility enhancement.

Keywords: Nanotechnology, Nanoparticles, Nanomorph technology, Bioavailability enhancement, Poorly water-soluble drugs, Nanosuspensions, Precipitation techniques

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APP ABSTRACT - APP 2026 - 228

DIGITAL TWIN–BASED AI SIMULATION FOR PERSONALIZED DRUG SAFETY MONITORING IN TELEMEDICINE

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Abstract

The rapid growth of telemedicine has revolutionized healthcare delivery; however, real-time drug safety monitoring in remote settings remains a major challenge. Adverse Drug Reactions (ADRs), medication errors, and limited direct patient assessment can compromise therapeutic outcomes. Digital Twin technology integrated with Artificial Intelligence (AI) provides an innovative solution for personalized drug safety surveillance within telehealth systems.A Digital Twin represents a dynamic virtual model of a patient created using real-time clinical data, laboratory values, physiological parameters, medication history, and genomic information. Through machine learning and predictive analytics, the system can simulate individual drug responses, predict potential adverse effects, optimize dosage regimens, and detect drug–drug interactions before clinical manifestation. This predictive model shifts pharmacovigilance from a reactive reporting approach to a proactive and preventive framework.In telemedicine, Digital Twin–based AI platforms can continuously monitor patient data, generate automated safety alerts, and support clinical decision-making. This approach is particularly beneficial for elderly patients, polypharmacy cases, and individuals with chronic diseases requiring long-term therapy. Additionally, it enhances medication adherence, reduces preventable hospitalizations due to ADRs, and supports regulatory compliance through structured digital documentation.Although challenges such as data privacy, interoperability, algorithm validation, and infrastructure integration exist, Digital Twin–based AI simulation represents a transformative advancement toward precision medicine and intelligent pharmacovigilance. This technology has the potential to redefine personalized drug safety monitoring in modern telehealth ecosystems.

Keywords: Digital Twin, Artificial Intelligence, Pharmacovigilance, Telemedicine, Personalized Medicine

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APP ABSTRACT - APP 2026 - 229

NANOTECHNOLOGY-BASED COSMECEUTICALS FOR PREVENTION OF SKIN AGING

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Abstract

Skin aging is a multifactorial process caused by intrinsic factors such as genetics and extrinsic factors like ultraviolet (UV) radiation, pollution, and lifestyle. UV exposure plays a major role by generating reactive oxygen species (ROS), leading to collagen degradation, wrinkles, and loss of skin elasticity. Cosmeceuticals containing antioxidants (vitamins C and E, coenzyme Q10), retinoids, and herbal compounds such as curcumin and resveratrol help in reducing oxidative stress and improving skin structure.

However, conventional topical formulations show limitations including poor skin penetration, low bioavailability, and possible irritation. To overcome these issues, nanotechnology-based delivery systems have been developed. Nanocarriers such as liposomes, niosomes, nanoemulsions, solid lipid nanoparticles (SLN), and nanostructured lipid carriers (NLC) enhance the delivery of active ingredients by improving stability, penetration, and controlled release.These advanced systems increase therapeutic efficacy while minimizing side effects. Overall, nanotechnology-based cosmeceuticals offer a promising approach for effective prevention and management of skin aging.

Keywords: Skin aging, Cosmeceuticals ,Nanotechnology ,Drug Delivery, Photo Aging , Nano Emulsion

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APP ABSTRACT - APP 2026 - 230

SMART DENDRIMER-BASED THERANOSTICS FOR PRECISION CANCER DIAGNOSIS AND TARGETED THERAPY

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ABSTRACT: Dendrimers are highly branched nanoscale macromolecules with a well-defined three-dimensional architecture and multiple surface functional groups, which allow for multifunctionality and precise control over size, shape, and surface chemistry. These unique properties make dendrimers ideal candidates for theranostic applications in cancer, combining both therapeutic and diagnostic capabilities in a single nanoscale platform. The purpose of this study is to explore dendrimer-based theranostic systems for targeted cancer treatment, enabling simultaneous tumor imaging, site-specific drug delivery, and controlled drug release to improve treatment efficacy while minimizing systemic toxicity.Theranostic dendrimers are engineered to carry anticancer drugs, imaging agents, and targeting ligands on their surface. They exploit passive targeting through the enhanced permeability and retention (EPR) effect and active targeting via receptor–ligand interactions, leading to selective accumulation in tumor tissues. Stimuli-responsive designs allow drug release triggered by tumor-specific conditions such as acidic pH, enzymes, or temperature. These mechanisms facilitate the formation of stable dendrimer–drug complexes at the tumor site while enabling real-time imaging to monitor therapeutic outcomes.Preclinical studies have demonstrated that dendrimer-based theranostics can enhance drug delivery efficiency, improve imaging sensitivity, and reduce off-target effects. Their biocompatibility, tunable properties, and multifunctionality make them a versatile platform for precision oncology.In , dendrimer-based theranostic systems represent a next-generation nanomedicine approach, integrating therapy and diagnostics to achieve targeted, efficient, and personalized cancer treatment. With continued research and clinical validation, these platforms have the potential to significantly advance cancer management and improve patient outcomes.

Keywords: Dendrimers, Theranostics, Targeted drug delivery, Tumor imaging, Precision oncology

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APP ABSTRACT - APP 2026 - 231

DEVELOPMENT OF REGION-SPECIFIC SPIROMETRIC NORMATIVE EQUATIONS AND GRAPHICAL NOMOGRAMS FOR SOUTH INDIAN ADULTS: A BIOSTATISTICAL MODELLING APPROACH TO ADDRESS ETHNIC VARIABILITY IN PULMONARY FUNCTION ASSESSMENT

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Chronic respiratory diseases affect millions globally. COPD is the fourth leading cause of death worldwide in 2024.Spirometry is the gold standard to assess lung function. Its interpretation is based on reference values that depend on sex, age, height, and ethnicity. The ECSC reference values were used before 2012, later replaced by the Global Lung Function Initiative (GLI). This research addresses a significant problem in respiratory health: the global spirometry reference standards, NHANES III and GLI 2012, are not accurate for the South Asians. These international standards overestimate lung function in Indians leading to incorrect diagnoses and misclassification of lung health. Existing Indian reference values also show discrepancies across regions, with no specific guidelines for South Indian adults. A multi-state, community-based, cross-sectional, study will be conducted across five South Indian states targeting 1,000 healthy, non-smoking adults. Detailed anthropometry, demographic variables, environmental and lifestyle exposures will be recorded. Spirometric data will be collected on FVC, FEV_1, FEV_1/FVC. Reference equations will be derived to estimate Lower Limit of Normal (LLN) and Z-scores. 10-fold internal cross-validation and external validation against global and pan-Indian standards will ensure the accuracy of models.**Expected Contribution & Human Impact:** A ***digital tool*** will be created for **improved** decision-making. The research will fill a critical gap in pulmonary diagnostics in India, ensuring clinicians have **region-specific** and **gender-appropriate** tools for spirometry assessment contributing to better respiratory health, reduced health-system burden. ***This study fulfils the ICMR's call for developing reference standards, making it a national priority.***

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APP ABSTRACT - APP 2026 - 232

LIPID NANOPARTICLES FOR MRNA AND VACCINE DELIVERY: A COMPREHENSIVE REVIEW

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Abstract:

Since the successful creation of mRNA vaccinations during the COVID-19 pandemic, messenger RNA (mRNA) treatments have drawn a lot of attention as a novel technique in contemporary medicine. mRNA molecules are intrinsically unstable and extremely vulnerable to destruction by enzymes found in biological surroundings, notwithstanding their therapeutic promise. Lipid nanoparticles (LNPs) have been developed as effective delivery systems that safeguard mRNA and facilitate its transport into target cells in order to overcome these obstacles. Ionizable lipids, phospholipids, cholesterol, and lipids modified with polyethylene glycol (PEG) make up LNPs, which are nanoscale transporters. Each element is essential for maintaining the stability of the nanoparticle structure, increasing circulation time, encouraging endosomal escape of the mRNA into the cytoplasm, and allowing cellular uptake. Once within the cell, ribosomes transform the supplied mRNA into therapeutic proteins or antigens that, in the case of vaccinations, might boost immune responses. LNP-based mRNA systems are now very successful for developing vaccines and other medicinal uses. Lipid nanoparticle systems are being investigated more and more for use in gene therapy, cancer immunotherapy, and the treatment of genetic disorders in addition to infectious disease vaccines. Nevertheless, there are still issues including possible toxicity, restricted organ-specific targeting, intricate production procedures, and storage stability. These constraints are being addressed by recent developments in nanotechnology, focused nanoparticle design, and artificial intelligence-assisted lipid creation. Lipid nanoparticle-based mRNA delivery systems are anticipated to be essential to the development of vaccines, precision medicine, and next-generation treatments as a result of ongoing research and technological advancements.

Keywords:
Lipid Nanoparticle Drug Delivery, messenger ribo nucleic acid (mRNA) and Vaccine Learning, Drug Delivery Efficiency, Nanomedicine, Next generation treatment

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APP ABSTRACT - APP 2026 - 233

PHYTOCHEMICAL ANALYSIS OF ETHANOL EXTRACT FROM *PHALERIA MACROCARPA*

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ABSTRACT:

Phaleria macrocarpa, commonly known as the "devil's fruit," is a plant renowned for its medicinal properties, with various bioactive compounds identified in its different parts. This study aims to conduct a comprehensive phytochemical analysis of the ethanol extract from the fruit of *Phaleria macrocarpa* to evaluate its chemical composition. The extraction process was carried out using ethanol as a solvent, and the resultant extract was analyzed for the presence of primary and secondary metabolites, including alkaloids, flavonoids, saponins, tannins, and terpenoids, through standard phytochemical screening techniques. indicated the presence of several bioactive compounds that are commonly associated with medicinal activity, supporting the traditional use of *P. macrocarpa* in herbal medicine. The findings highlight the potential of the ethanol extract from *Phaleria macrocarpa* as a valuable source of phytochemicals with therapeutic properties, paving the way for further research into its Nano particles formulation and evaluation & pharmacological applications.

Keywords: *Phaleria macrocarpa,* Diabetic, Devil's Fruit.

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APP ABSTRACT - APP 2026 - 234

REDEFINING PHARMACY PRACTICE THROUGH PHARMACEUTICAL CARE

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Abstract:
Pharmaceutical care is a revolutionary change in the practice of pharmacy, going beyond the conventional role in dispensing medication to a model of care focused on the patient. It aims to ensure the judicious delivery of drug treatment that will lead to specific therapeutic improving the quality of life of patients. It entails the proactive detection, prevention, and resolution of drug-related issues and guarantees the safe, effective, and cost-effective use of medicines.Pharmacists, as valued members of the multidisciplinary healthcare team, are key players in patient education, therapy monitoring, and encouraging medication compliance. The implementation of pharmaceutical care in clinical practice has proved valuable, with benefits such as decreasing adverse drug reactions, improving treatment outcomes, and increasing patient Satisfaction. With mounting chronic disease burden and healthcare complexity, pharmaceutical care is critical in providing individualized, evidence-based, and comprehensive care. Redefining pharmacy practice in the context of pharmaceutical care not only secures the professional pharmacist role but also contributes significantly to overall healthcare outcome improvement.

Keywords: Pharmaceutical care, Patient-centered care, Pharmacy practice, Drug therapy management, Quality of life, Drug-related problems, Safe and effective use of medicines

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APP ABSTRACT - APP 2026 - 235

A PROSPECTIVE COMPARATIVE EVALUATION OF METRONIDAZOLE-DOXYCYCLINE THERAPY WITH AND WITHOUT PROBIOTIC SUPPLEMENTATION ON CLINICAL OUTCOMES IN BACTERIAL VAGINOSIS

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ABSTRACT

Bacterial vaginosis is characterized by the overgrowth of various anaerobic bacteria within the vaginal ecosystem. It is regarded as one of the most frequent gynaecological complaints affecting women of different reproductive age groups. It is managed by broad and narrow-spectrum antibiotics such as Doxycycline and Metronidazole, respectively, in combination that target polymicrobial etiology. Increased use of antibiotics can affect the vaginal microbial flora and can produce side-effects like nausea, vomiting, metallic taste, etc. It can be overcome by the use of probiotics. On integrating antibiotics with oral probiotics, they not only help in the eradication of infection but also prevent recurrence, side effects of antibiotics, and improve
vaginal hygiene.

KEYWORD: Bacterial vaginosis, Metronidazole, Doxycycline, Probiotic supplementation

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APP ABSTRACT - APP 2026 - 236

COST-EFFECTIVE OF FRAILTY BASED PREOPERATIVE ASSESMENT IN PATIENT UNDERGOING CORONARY ARTERY BYPASS GRAFTING

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Abstract

Coronary artery bypass grafting (CABG) is one of the most frequently performed cardiac surgeries for the treatment of advanced coronary artery disease (CAD). Although percutaneous coronary intervention (PCI) has increasingly been used as an alternative revascularization strategy, CABG remains the preferred treatment for patients with complex multi-vessel disease. Frailty is a geriatric syndrome characterized by decreased physiological reserve and increased vulnerability to stressors such as surgery. The presence of frailty in patients undergoing cardiac surgery has been associated with poor postoperative outcomes including prolonged hospitalization, complications, functional decline, and increased mortality. Recently, frailty assessment tools have been incorporated into preoperative evaluation to guide clinical decision-making and optimize patient care. This review focuses on the cost-effectiveness of frailty assessment before CABG surgery. The article discusses current literature, study objectives, , and expected outcomes related to economic evaluation using decision-analytic models. The findings suggest that routine frailty screening prior to CABG may improve clinical outcomes while also being a cost-effective strategy for healthcare systems.

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APP ABSTRACT - APP 2026 - 237

HPLC- UV ANALYTICAL METHOD DEVELOPMENT WITH BOX-BEHNKEN DESIGN ASSISTED OPTIMIZATION OF AURANOFIN, OXACEPROL AND TOFACITINIB IN PHARMACEUTICAL DOSAGE FORM

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ABSTRACT

Rheumatoid Arthritis is most common Geriatric Chronic Inflammatory disease that affects the joints, an analytical method was developed for the newer medications Auranofin, Oxaceprol and Tofacitinib by High performance liquid chromatography (HPLC) and Ultra Violet (UV) spectroscopy. To develop novel analytical methods with validation and degradation analysis of newer Anti rheumatic medication. The Cary 5000 double-beam spectrophotometer was used to detect the UV absorbance. Chromatographic separation was performed in Agilent C_{18} column with a mobile phase consisting of different concentrations of methanol and phosphate buffer. Variables of the methods was optimized by response surface via the Box–Behnken design using Digital expert Stat- Ease -360 software. The methods were verified by ICH requirements, the stability of the drugs was considered under forced stress environment and observed a transitional degradation pattern. The drugs exhibit chromatographic peak with retention periods less than 4 minutes with a clear and distinct peak for AUR, OXP and TFB detected at wavelength maximums of 232, 212 and 295 respectively. The three medications have a percentage recovery ranging from 97% to 100% w/w. : The developed method was found to be consistent and appropriate for routine screening of selected anti rheumatic drugs in bulk dosage form as well as pharmaceutical formulation.

Keywords: HPLC, UV, Auranofin, Oxaceprol, Tofacitinib, Box Behnken

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APP ABSTRACT - APP 2026 - 238

AI-ASSISTED DESIGN OF NANOTECHNOLOGY-BASED DRUG DELIVERY SYSTEMS FOR CRISPR GENE EDITING THERAPEUTICS

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Abstract:

Recent advancements in gene editing technologies have revolutionized modern therapeutics, with the CRISPR-Cas9 gene editing system emerging as a powerful tool for precise genome modification. Despite its immense therapeutic potential in the treatment of genetic disorders, cancers, and infectious diseases, the safe and efficient delivery of gene-editing components to target cells remains a major challenge. Nanotechnology-based drug delivery systems provide promising solutions by enabling enhanced stability, controlled release, and targeted cellular uptake of CRISPR components. Recent integration of Artificial Intelligence in Drug Discovery into pharmaceutical research has accelerated the design and optimization of nanocarriers for gene editing applications. AI-driven computational models can predict critical nanoparticle parameters—including size, surface charge, biocompatibility, and targeting efficiency—thereby improving delivery performance while minimizing toxicity.Researchers can create highly effective and focused platforms for CRISPR-based treatments by fusing AI-assisted design with cutting-edge nanomaterials like lipid nanoparticles, polymeric nanoparticles, and inorganic nanoparticles. This multidisciplinary approach is a game-changer in precision medicine, where AI-guided nanotechnology improves the therapeutic efficacy, safety, and specificity of genome editing systems. The combination of CRISPR technology, nanomedicine, and artificial intelligence has enormous potential to create next-generation treatments for genetic illnesses that were thought to be incurable. The recent advancements, current difficulties, and potential applications of AI-assisted nanotechnology-based CRISPR gene editing delivery systems in advanced pharmaceutical sciences are highlighted in this work.

Keywords:

CRISPR-Cas9 gene editing system, Nanomedicine, Artificial Intelligence in Drug Discovery, Targeted Drug Delivery Systems, Precision Medicine

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APP ABSTRACT - APP 2026 - 239

APPLICATION OF GRAPH NEURAL NETWORKS IN PREDICTING DRUG–DRUG INTERACTIONS AND ADVERSE DRUG REACTIONS FOR ENHANCED PHARMACOVIGILANCE

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Abstract

Drug–drug interactions (DDIs) and associated adverse drug reactions (ADRs) pose a significant challenge in modern pharmacotherapy, particularly in patients exposed to polypharmacy. Traditional rule-based screening systems are limited by high false-positive alerts and inability to capture complex biological interconnections. Graph Neural Networks (GNNs), an advanced deep learning approach, provide a novel framework for modeling drugs, enzymes, targets, and pathways as interconnected graph structures. In this method, drugs are represented as nodes and their pharmacological interactions as edges, enabling multi-hop relational learning across heterogeneous biomedical networks. By integrating molecular structure data, protein–protein interaction networks, and pharmacovigilance databases, GNN models can identify hidden interaction patterns and predict previously unknown DDIs. Recent advances in attention-based and heterogeneous GNN architectures demonstrate superior predictive accuracy and interpretability compared to conventional machine learning models. Furthermore, incorporation of real-world adverse event reporting systems enhances early ADR signal detection and risk stratification. This AI-driven strategy offers a scalable and data-oriented solution to improve medication safety, strengthen pharmacovigilance systems, and support precision pharmacotherapy, aligning with the evolving role of artificial intelligence in healthcare.

Keywords: Graph Neural Networks; Drug–Drug Interactions; Adverse Drug Reactions; Pharmacovigilance; Artificial Intelligence

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APP ABSTRACT - APP 2026 - 240

NANOFIBER SCAFFOLDS FOR DRUG DELIVERY IN TISSUE REGENERATION

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Abstract

Tissue damage caused by trauma, chronic diseases, or surgical interventions remains a major challenge in modern healthcare. Conventional drug delivery methods often fail to provide sustained and localized therapeutic effects at the damaged tissue site. Nanotechnology-based approaches, particularly nanofiber scaffolds, have emerged as promising platforms for enhancing drug delivery and supporting tissue regeneration.Nanofiber scaffolds mimic the natural extracellular matrix (ECM) structure, providing a suitable environment for cell attachment, proliferation, and differentiation. Their high surface area, porosity, and tunable physicochemical properties allow efficient loading and controlled release of therapeutic agents such as growth factors, antibiotics, and anti-inflammatory drugs. These properties make nanofiber scaffolds highly suitable for regenerative medicine applications.Nanofiber scaffolds were fabricated using the electrospinning technique with biocompatible polymers such as polycaprolactone and gelatin. Therapeutic agents were incorporated into the nanofibers during the fabrication process to enable sustained drug release. The scaffolds were characterized using scanning electron microscopy for morphology, drug loading efficiency tests, and in-vitro drug release studies. Cell viability and proliferation assays were conducted to evaluate biocompatibility and regenerative potential.The fabricated nanofiber scaffolds exhibited uniform fiber morphology, high drug encapsulation efficiency, and controlled drug release over an extended period. In-vitro studies demonstrated improved cell adhesion, proliferation, and enhanced tissue regeneration potential compared with conventional drug delivery systems. Nanofiber scaffolds represent a promising strategy for localized and sustained drug delivery in tissue regeneration. Their biomimetic structure and controlled release capability may significantly improve therapeutic outcomes in regenerative medicine and advanced drug delivery systems.

Keywords:Nanofiber scaffolds, drug delivery, tissue regeneration, electrospinning, regenerative medicine.

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APP ABSTRACT - APP 2026 - 241

LIPID NANOPARTICLES IN MODERN DRUG DELIVERY OF NATURAL BIOACTIVE COMPOUNDS

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ABSTRACT

The natural compounds found in plants, such as polyphenols, flavonoids, terpenes and alkaloids are known to have health benefits like fighting antioxidants reducing inflammation and preventing cancer. However their use as medicines is limited because they do not dissolve well are not easily absorbed by the body are unstable in the system and are quickly broken down. Lipid-based nanoparticles are being explored as a solution to these problems. These nanoparticles, including liposomes, solid lipid nanoparticles and nanostructured lipid carriers are being studied to improve the stability targeting ability and controlled release of plant-based compounds. The studies reviewed here looked at how the formulation and application of lipid-based nanoparticles for the delivery of plant-derived bioactive compounds were investigated and were formulated using lipid nanoparticle systems. The compounds are curcumin, resveratrol, quercetin, epigallocatechin gallate and silymarin. By incorporating these compounds into lipid-based nanoparticles, their stability, solubility and effectiveness can be improved. The showed that using lipid nanoparticles greatly improves the delivery of these compounds. The use of lipid nanoparticles enhances the activity, controlled release entrapment efficiency and improved pharmacokinetics compared to traditional formulations. Lipid-based nanoparticles seem to be an approach to improving the stability, solubility, effectiveness and they can overcome the limitations of herbal drug formulations. Lipid nanoparticles are being recognized as a tool to improve the pharmacokinetic profile of natural bioactive compounds.

KEYWORDS: Lipid based nanoparticles, nanostructured lipid particles, drug delivery systems, bioavailability enhancement, controlled drug release

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APP ABSTRACT - APP 2026 - 242

SILENT SIGNALS: MULTI-SYSTEMIC CONSEQUENCES OF AMIODARONE IN CARDIOVASCULAR PATIENTS – A PROSPECTIVE CLINICAL PROFILING STUDY

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Abstract -Amiodarone remains a cornerstone in the management of atrial and ventricular arrhythmias; however, its therapeutic success is frequently overshadowed by insidious multi-system toxicities arising from its lipophilicity, tissue accumulation, and prolonged half-life. Despite established monitoring recommendations, real-world prospective data defining the cumulative incidence and temporal evolution of these toxicities remain limited. This study aims to systematically evaluate the incidence, time-to-onset, and determinants of hepatic injury, thyroid dysfunction, and clinically significant QTc prolongation among patients newly initiated on oral amiodarone. A six-month prospective observational study will be conducted at a tertiary care hospital, enrolling approximately 150 adult cardiovascular patients. . Causality and severity of adverse drug reactions were evaluated using Naranjo's algorithm and the Modified Hartwig and Siegel scale. Baseline liver function tests (ALT, AST), thyroid profile (TSH, Free T4), and 12-lead ECG (QTc) will be recorded prior to therapy initiation. Follow-up assessments will occur at 48 hours, 1 week, 1 month, 3 months, and 6 months. Significant hepatic injury is defined as ALT/AST ≥3× ULN; clinically relevant QTc prolongation as QTc >500 ms or ≥60 ms increase from baseline; and thyroid dysfunction as biochemical hypothyroidism or thyrotoxicosis. Data will be analyzed using repeated-measures ANOVA, Kaplan–Meier survival analysis, and logistic regression to identify independent risk factors. The study is expected to generate robust incidence rates, establish median time-to-onset for each toxicity, and delineate high-risk patient subsets. By integrating structured pharmacovigilance with longitudinal monitoring, this research seeks to strengthen institutional safety protocols, reducing preventable morbidity in cardiovascular practice and optimize therapeutic outcomes in intensive and critical care settings.

Keywords: Amiodarone, Adverse Drug Reactions, Hepatotoxicity, Thyroid Dysfunction, QTc Prolongation

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APP ABSTRACT - APP 2026 - 243

NANOPARTICLE-BASED TARGETED DRUG DELIVERY IN CANCER PHARMACOTHERAPY: A CLINICAL PHARMACIST'S PERSPECTIVE ON TRANSLATIONAL OPPORTUNITIES AND PATIENT OUTCOME Optimization

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Abstract

Conventional cancer chemotherapy remains burdened by non-selective systemic toxicity, narrow therapeutic windows, and suboptimal pharmacokinetic profiles that compromise patient quality of life and treatment adherence. The emergence of nanoparticle-based drug delivery systems (NDDS) represents a paradigm shift in oncology pharmacotherapy, enabling precise spatial and temporal control of drug release at tumour sites. This review aims to: (1) critically evaluate the major nanocarrier platforms employed in cancer drug delivery including liposomes, polymeric nanoparticles, dendrimers, and solid lipid nanoparticles; (2) analyse how nanoformulation alters key pharmacokinetic parameters — Cmax, Tmax, AUC, and elimination half-life — compared to conventional formulations; (3) assess clinically approved nanoformulations and their therapeutic outcomes; and (4) identify the pharmacist's role in optimizing nanoparticle-based cancer regimens in clinical practice. A comprehensive literature review was conducted using PubMed, ScienceDirect, Google Scholar, and ClinicalTrials.gov databases. Studies published between 2015 and 2025 on nanoparticle-based cancer drug delivery, clinical pharmacokinetics of nanoformulations, and patient outcome data were included. Keywords used: "nanoparticles cancer drug delivery," "liposomal chemotherapy clinical outcomes," "polymeric nanoparticles oncology pharmacokinetics," and "targeted drug delivery tumor." A total of 65 peer-reviewed articles, 8 clinical trial reports, and 4 systematic reviews were analyzed. Nanoparticle-based drug delivery systems represent a transformative advancement in cancer pharmacotherapy, demonstrating measurable improvements in pharmacokinetic profiles, tumour targeting efficiency, and patient clinical outcomes. Future research should prioritise personalised nanomedicine approaches, real-world pharmacovigilance data, and clinical pharmacist-led NDDS counselling frameworks.

Keywords: Nanoparticles, Targeted Drug Delivery, Cancer Pharmacotherapy, Liposomes, Pharmacokinetics, Clinical Pharmacy, EPR Effect, Tumour Microenvironment

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APP ABSTRACT - APP 2026 - 244

PHARMACOKINETICS OF NOVEL DRUG DELIVERY SYSTEMS

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Novel Drug delivery System (NDDS) refers to the approaches, formulations, technologies, and systems for transporting a pharmaceutical compound in the body as needed to safely achieve its desired therapeutic effects.NDDS is a system for delivery of drug other than conventional drug delivery system. NDDS is a combination of advance technique and new dosage forms which are far better than conventional dosage forms.NDDS protects drugs from degradation in the gastrointestinal tract and improves absorption, resulting in better bioavailability.

Rather than the rapid peak-and-trough plasma concentrations of conventional drugs, NDDS allows for a steady, prolonged, and consistent therapeutic concentration.Nanocarriers can be modified to bypass biological barriers (like the blood-brain barrier) and increase accumulation.By sequestering the active ingredient, NDDS can slow the metabolism and prolong the half-life of drugs.In , Novel Drug Delivery Systems (NDDS) revolutionize pharmacokinetics by enabling controlled drug release, reducing degradation, and enhancing bioavailability, which leads to sustained and targeted delivery, minimized toxicity, and consistent therapeutic plasma levels within the therapeutic window.

Keywords: Novel Drug Delivery Systems (NDDS), pharmacokinetics, bioavailability, controlled release, targeted delivery.

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APP ABSTRACT - APP 2026 - 245

PHARMACY PRACTICE, A GUIDE TO CLINICAL PRACTICE

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ABSTRACT

Pharmacy practice is a vital healthcare discipline dedicated to the safe, effective, and rational use of medications to promote optimal patient health outcomes across various clinical settings. Over the years, the profession has significantly evolved from a product-focused dispensing role to a comprehensive, patient-centered model of care that integrates clinical expertise, pharmaceutical sciences, and interprofessional collaboration. Within this broader framework, clinical pharmacists have emerged as indispensable healthcare professionals who work alongside physicians, nurses, and allied health teams to design, implement, and monitor individualized medication therapy plans. They play a critical role in identifying and resolving drug-related problems, preventing adverse drug reactions, conducting medication therapy management, and ensuring therapeutic drug monitoring for optimal clinical outcomes. Clinical pharmacists also provide essential patient education on medication adherence, disease management, and lifestyle modifications, empowering patients to actively participate in their own care.Their involvement in managing chronic conditions such as diabetes, hypertension, cardiovascular diseases, and respiratory disorders has demonstrated measurable improvements in treatment efficacy and reductions in hospital remissions. The growing integration of pharmacogenomics, evidence-based medicine, and digital health technologies continues to expand the clinical pharmacist's capacity to deliver personalized and precision-based pharmaceutical care. clinical pharmacists are central to modern healthcare delivery, bridging the gap between pharmaceutical science and compassionate patient care to enhance safety, efficiency, and overall health outcomes.

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APP ABSTRACT - APP 2026 - 246

ADVANCED STRATEGIES FOR ENHANCING ORAL BIOAVAILABILITY OF POORLY WATER-SOLUBLE DRUGS

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Abstract:

The oral bioavailability of a significant number of recently discovered therapeutic compounds is adversely affected by poor water solubility, presenting a critical challenge in pharmaceutical research. Medications categorized as Class II and Class IV in the Biopharmaceutics Classification System (BCS) often exhibit inadequate dissolution in gastrointestinal fluids, which subsequently restricts absorption and reduces therapeutic efficacy.To address these challenges, numerous strategies for improving bioavailability have been developed. Techniques such as particle size reduction, solid dispersion systems, lipid-based formulations, and innovative drug delivery methods rooted in nanotechnology have demonstrated considerable potential for enhancing drug solubility and dissolution rates. Advanced carriers, including self-emulsifying drug delivery systems (SEDDS), liposomes, nanoparticles, and nanoemulsions, further support enhanced systemic medication absorption by improving drug permeability.In , modern formulation techniques are crucial for overcoming solubility-related barriers and enhancing the oral bioavailability of poorly soluble medications. Ongoing research into these advanced drug delivery methods is expected to amplify therapeutic efficacy and aid in the development of more effective pharmaceutical formulations.

Keywords: Bioavailability enhancement, poorly water-soluble drugs, BCS Class II drugs, Nanotechnology, Drug delivery systems.

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APP ABSTRACT - APP 2026 - 247

RECENT INNOVATIONS IN NANO MEDICINE AND NANO-BASED TECHNIQUES FOR THE TREATMENT OF BREAST CANCER

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Abstract

Breast cancer remains one of the most prevalent malignancies and a leading cause of cancer-related mortality among women worldwide. Despite significant advancements in conventional treatment modalities such as surgery, chemotherapy, radiotherapy, and hormonal therapy, several limitations including systemic toxicity, poor drug specificity, multidrug resistance, and unfavorable side effects continue to hinder effective treatment outcomes. In recent years, nanomedicine has emerged as a promising therapeutic approach for improving the diagnosis and treatment of breast cancer through targeted and controlled drug delivery systems.Nanotechnology utilizes nanoscale materials (1–100 nm) to enhance drug stability, bioavailability, and therapeutic efficacy while minimizing toxicity to healthy tissues. Various nanocarriers such as liposomes, polymeric nanoparticles, dendrimers, metallic nanoparticles, and lipid nanoparticles have been extensively investigated for breast cancer therapy. These nanosystems exploit mechanisms such as the enhanced permeability and retention (EPR) effect and tumor microenvironment responsiveness to achieve selective accumulation in tumor tissues. Furthermore, recent advancements in nano-based therapeutic strategies, including photothermal therapy, photodynamic therapy, gene therapy, and nanoparticle-mediated immunotherapy, have demonstrated significant potential in improving treatment efficacy and reducing adverse effects. Multifunctional nanoparticles capable of integrating diagnostic and therapeutic functions (theranostics) are also gaining considerable attention in personalized cancer therapy. Although promising outcomes have been reported, challenges such as nanoparticle toxicity, scalability, and regulatory concerns remain significant barriers to clinical translation. Continued research and technological innovation are essential to fully realize the potential of nanomedicine in breast cancer management.

Keywords: Breast Cancer, Nanomedicine, Nanoparticles, Targeted Drug Delivery, Photothermal Therapy, Photodynamic Therapy, Tumor Microenvironment, Theranostics

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APP ABSTRACT - APP 2026 - 248

NANOTECHNOLOGY IN ONCOLOGY: ADVANCING TARGETED DRUG DELIVERY AND PRECISION CANCER THERAPEUTICS.

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Abstract :

Nanotechnology has emerged as a powerful interdisciplinary platform that is reshaping modern pharmaceutical and biomedical research. By manipulating materials at the nanoscale (1–100 nm), nanotechnology enables the development of innovative therapeutic and diagnostic systems with enhanced biological interactions and functional properties. In recent years, nanomedicine has introduced a variety of advanced nanocarriers, including polymeric nanoparticles, liposomes, dendrimers, and metallic nanoparticles, designed to improve drug solubility, stability, bioavailability, and site-specific delivery. These nanosystems offer significant advantages over conventional drug delivery strategies by enabling controlled and targeted release of therapeutic agents. Among its diverse biomedical applications, nanotechnology has shown remarkable promise in cancer diagnosis and therapy. Conventional chemotherapeutic approaches are often limited by poor selectivity and systemic toxicity. Nanoparticle-based drug delivery systems overcome these limitations by facilitating preferential accumulation of anticancer agents in tumor tissues through mechanisms such as the enhanced permeability and retention (EPR) effect. This targeted approach enhances therapeutic efficacy while minimizing damage to healthy cells. Furthermore, nanotechnology is advancing cancer diagnostics through nano-enabled biosensors, imaging agents, and multifunctional theranostic platforms that integrate diagnosis and treatment within a single system. Emerging strategies, including stimuli-responsive nanoparticles and smart nanoplatforms, further enable controlled drug release and real-time monitoring of disease progression. Despite challenges related to nanotoxicity, regulatory approval, and large-scale manufacturing, nanotechnology continues to hold immense potential for transforming cancer management and advancing precision medicine.

Keywords: Nanotechnology, Nanomedicine, Targeted Drug Delivery, Nanocarriers, Cancer Nanotherapy, Precision Medicine.

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APP ABSTRACT - APP 2026 - 249

SELF-NANO EMULSIFYING DRUG DELIVERY SYSTEMS (SNEDDS) FOR ENHANCING THE BIOAVAILABILITY OF POORLY SOLUBLE DRUGS

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One of the frequent challenges faced during oral drug formulation is the poor water solubility of many therapeutic compounds. When a drug does not dissolve well in gastrointestinal fluids, its absorption into the bloodstream becomes limited, which may reduce its therapeutic effectiveness. A significant proportion of newly developed drugs fall under the Biopharmaceutics Classification System (BCS) class II and IV, where low solubility plays a major role in limiting drug performance. In recent years, novel drug delivery strategies have been explored to address this problem. Among these approaches, Self-Nano Emulsifying Drug Delivery Systems (SNEDDS) have attracted considerable interest because they can enhance drug solubilization and improve absorption after oral administration. The aim of this study is to discuss the potential of SNEDDS as an approach for improving the oral bioavailability of drugs with poor aqueous solubility. The work also focuses on understanding the formulation components involved in SNEDDS and how these systems contribute to better drug dissolution and absorption. This study is based on an analysis of previously published scientific literature related to nanoemulsion-based drug delivery systems. Relevant information was gathered from pharmaceutical journals, review papers, and research reports to understand the formulation principles, composition, and performance of SNEDDS. The discussion mainly highlights the importance of oils, surfactants, and co-surfactants in forming stable nano-sized emulsions that facilitate improved drug delivery. Available studies suggest that SNEDDS can markedly enhance the dissolution behavior of drugs that have poor water solubility. When exposed to the fluids of the gastrointestinal tract, these formulations rapidly form nano-sized oil-in-water emulsions with extremely small droplets. The formation of such fine droplets increases the surface area for drug release and supports better solubilization. As a result, drugs formulated using SNEDDS demonstrate improved absorption and enhanced pharmacokinetic profiles compared with conventional dosage forms. SNEDDS represent a promising formulation approach for addressing the issue of low drug solubility. By improving drug dissolution and facilitating better absorption, this system has the potential to enhance the therapeutic effectiveness of many poorly soluble drugs. Therefore, SNEDDS continue to be an important area of research in the development of modern oral drug delivery systems.

Keywords: SNEDDS, Bioavailability enhancement, Nanoemulsion systems, Poorly soluble drugs, Oral drug delivery.

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APP ABSTRACT - APP 2026 - 250

PIC: QUANTUM DOTS IN NON-INVASIVE IMAGING OF ORAL SQUAMOUS

CELL CARCINOMA

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Quantum Dots (QDs) are nanoscale semiconductor particles that exhibit unique optical and fluorescent properties, making them valuable tools in modern biomedical imaging and diagnostics. Due to their small size, high photostability, and strong fluorescence emission,quantum dots have gained considerable attention for their potential use in early cancerdetection. One of the major areas where this technology can be applied is the diagnosis ofOral Squamous Cell Carcinoma (OSCC), which represents the most common form of oraL cancer worldwide. Early detection of OSCC is essential to improve patient survival andtreatment outcomes; however, conventional diagnostic methods such as biopsy andhistopathological analysis are invasive, time-consuming, and sometimes uncomfortable for

patients.Quantum dot-based imaging provides a promising non-invasive alternative for detecting oralcancer at an early stage. Quantum dots typically range from 2–10 nm in size and can emitbright fluorescence when stimulated by a light source. Their emission wavelength can betuned depending on their size, enabling precise imaging and detection of multiple biomarkers

simultaneously. For diagnostic purposes, quantum dots can be conjugated withorligands that specifically bind to biomarkers expressed on cancer cells, such as epidermagrowth factor receptor (EGFR) and other tumor-associated proteins.

When these functionalized quantum dots are applied topically in the oral cavity or delivered locally, they selectively bind to abnormal or malignant cells. Upon excitation with a suitablelight source, the bound quantum dots emit fluorescent signals that can be detected usingoptical imaging systems. This allows clinicians to visualize cancerous or precancerous lesionsin real time without the need for invasive procedures. Additionally, quantum dot imagingmay help identify tumor margins more accurately during surgical interventions.Despite their advantages, challenges such as potential toxicity, biocompatibility concerns, andlong-term safety issues remain barriers to their widespread clinical application. Ongoingresearch focuses on developing safer and more biocompatible quantum dots for medical use.Quantum dot-based imaging represents a promising nanotechnology-drivenapproach for the early and non-invasive detection of oral squamous cell carcinoma, with thpotential to significantly improve diagnostic accuracy and patient outcomes.

KEY WORDS: quantum dots, non-invasive imaging, oral squamous cell carcinoma

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APP ABSTRACT - APP 2026 - 251

DIGITAL PILLS: A REVIEW ON TINY TECHNOLOGY FOR SMARTER TREATMENT

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Abstract:

Digital pills are an innovative technology that combines medicine with digital systems to improve patient care. These pills help monitor whether patients take their medication properly and how the treatment works in the body. This technology supports modern healthcare by allowing real-time monitoring and improved disease management. One major problem in healthcare is that many patients forget or skip their medicines.Digital pills can help address this issue by tracking medication intake. These pills contain tiny ingestible sensors that activate after reaching the stomach. The sensor sends signals to an external device, which records information about when the medicine was taken. This allows doctors and caregivers to better understand patient adherence and evaluate treatment effectiveness.Digital pills can be used for many chronic and acute diseases. They include ingestible sensors, small electronic components, and wireless communication systems.This review discusses the working mechanism, applications, advantages, and challenges of digital pill technology in modern healthcare. By integrating medicine with digital technology, digital pills support personalized treatment, enhance medication adherence, and contribute to more efficient and effective healthcare delivery.

KeyWords: Digital pills, Medication Adherence, Ingestible sensors, Real time monitoring, Diseases management, Personalized medicine.

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APP ABSTRACT - APP 2026 - 252

ANALYTICAL METHODS IN CARDIOVASCULAR DRUG RESEARCH: A REVIEW OF COMPARATIVE STRATEGIES AND EMERGING TRENDS

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Abstract:

The cardiovascular diseases need to have precise quantification of various drugs and their metabolites to guarantee therapeutic effectiveness and safety. Various methods of analysis - including inexpensive UV-visible spectrophotometry down to high-end LC-MS/MS and GC-MS have been used in this field. Both techniques have their own strengths and weaknesses with respect to sensitivity, selectivity, speed as well as the environmental impact. Green metrics (e.g. Eco-Scale, GAPI, AGREE) are now complimentary and commonplace to assess the sustainability of these approaches.This review represents a comparative analysis of the principles and performance of UV-Vis, micellar electrokinetic capillary electrophoresis (MEKC/CE), HPLC/UPLC, LC-MS/MS and GC-MS in cardiovascular drugs analysis, with a focus on new applications in pharmacokinetics (PK) and bioequivalence (BE) studies. We address such troubles like complicated sample matrices and regulatory demands, and look at the new developments, such as real-time wearable/biosensor monitoring and AI-based method development.The discussion is supported with the help of 60 peer-reviewed references, and the comparison of methods, green chemistry metrics, and future workflows is summarized with illustrative figures and tables. It is aimed at bringing a comprehensive, current review of the strategies of analysis that can be used to strike a balance between performance and sustainability in cardiovascular drug research.

Keywords:
Cardiovascular drugs; Analytical methods; HPLC; UPLC; LC–MS/MS; MEKC; Pharmacokinetics; Bioequivalence; Green analytical chemistry; Therapeutic drug monitoring.

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APP ABSTRACT - APP 2026 - 253

PHARMACEUTICAL APPROACHES TO VITILIGO: ADVANCES IN DRUG DEVELOPMENT AND ANALYSIS

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Abstract:

Vitiligo is the chronic skin condition where white patches appear on the skin due to the loss of pigment-producing cells. One of the most notable breakthroughs is the introduction of topical ruxolitinib 1.5% cream. Epidemiology of vitiligo in India total prevalence (2.4-5.5%) and higher prevalence northern India (3.5-6.5%) and western India (3.2-5.8%), and lower prevalence southern India (1.5-3.5%) and eastern India (1.2-3.2%). There are two main types, they are localized and generalized. Established Pharmaceutical Approaches include topical corticosteroids to reduce inflammation and stimulate repigmentation in localized lesions, and topical calcineurin inhibitors (tacrolimus, pimecrolimus) as immunomodulators for non-segmental vitiligo. Systemic corticosteroids, specifically low-dose oral glucocorticoids, can stabilize rapidly progressive disease. Targeted Approaches, JAK Inhibitors are a significant focus in dermatological treatment, including vitiligo. Additionally, combination therapies, such as pairing NB-UVB phototherapy with topical corticosteroids or calcineurin inhibitors, are being explored to enhance repigmentation. Future treatments will likely involve targeted therapies addressing specific mechanisms causing melanocyte loss.

Keywords: vitiligo, ruxolitinib, corticosteroids, calcineurin, non-segmental vitiligo, NB-UVB phototherapy, glucocorticoids, JAK inhibitors.

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APP ABSTRACT - APP 2026 - 254

EVALUATION OF PROPHYLACTIC ANTIBIOTIC USE IN SURGICAL PROCEDURE

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ABSTRACT

We use antibiotics before surgery to prevent infections after the operation infections at the site of the surgery. The right choice of antibiotic when to give it and how long to give it are very important to make sure the works and to minimize bad side effects and the development of antibiotic resistance..

Often doctors do not use antibiotics correctly. This study looks at how antibiotic used before surgery and if this use is appropriate. We watched what happened in the surgery department of a hospital over six months. We collected information from patients who had surgery that was planned and from patients who had emergency surgery. We decided if the use of the antibiotic was appropriate by looking at guidelines from the World Health Organization and the Centers for Disease Control and Prevention.We watched what happened in the surgery department of a hospital over six months. We collected information from patients who had surgery that was planned and from patients who had emergency surgery. We wrote down information about the patients the type of surgery they had which antibiotic they got when they got it how much they got and how long they got it. Our study shows that there is a difference, between what the guidelines say to do and what actually happens in the hospital when it comes to using antibiotics before surgery. The common problems we found were that the antibiotics were not given at the right time and they were given for too long. If hospitals follow the guidelines and use antibiotics carefully patients will be off and there will be less chance of antibiotics not working anymore

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APP ABSTRACT - APP 2026 - 255

IN VITRO EVALUATION OF ALSTONIA SCHOLARIS BARK EXTRACT

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ABSTRACT

Chronic inflammation and rheumatoid arthritis involve the overactivation of macrophages, leading to the excessive release of pro-inflammatory mediators like nitric oxide (NO) and cytokines. Alstonia scholaris (Devil's Tree) is rich in alkaloids and flavonoids. This study investigates its anti-inflammatory and anti-arthritic potential by suppressing Lipopolysaccharide (LPS)-induced inflammatory pathways in RAW 264.7 cells. Dried bark was extracted using methanol via the Soxhlet apparatus and concentrated.RAW 264.7 macrophages were cultured and stimulated with LPS (1 \mug/mL) to induce an inflammatory state.Cell Viability: Assessed via MTT assay to ensure non-toxicity.NO production was measured using Griess reagent. Inhibition of protein (Albumin) denaturation was used as an in vitro model for arthritis. The extract showed no significant toxicity up to 200 \mug/mL. In LPS-induced cells, the bark extract significantly reduced NO production in a dose-dependent manner (IC_{50} \approx 85 \mug/mL). Furthermore, the extract exhibited substantial anti-arthritic activity by inhibiting protein denaturation (up to 78% at 500 \mug/mL), comparable to the standard drug Diclofenac Sodium.Alstonia scholaris bark extract possesses potent anti-inflammatory and anti-arthritic properties. By inhibiting macrophage activation and protein degradation, it serves as a promising natural candidate for treating inflammatory joint diseases.

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APP ABSTRACT - APP 2026 - 256

ANALYTICAL METHOD VALIDATION OF TOFACITINIB ORAL SUSPENSION USING HPLC TECHNIQUE.

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ABSTRACT:

This study focuses on the development and validation of a simple, reliable, and precise High-Performance Liquid Chromatography (HPLC) method for the simultaneous estimation of tofacitinib and sodium benzoate in an oral suspension (1 mg/mL). The method was designed to ensure accurate quantification of the active pharmaceutical ingredient and preservative in a combined formulation.Chromatographic separation was achieved using a C8 column with an optimized mobile phase consisting of buffer and acetonitrile under isocratic conditions. Detection was carried out at dual wavelengths of 210 nm for tofacitinib and 230 nm for sodium benzoate, providing clear and well-resolved peaks. The method was validated in accordance with regulatory guidelines, including parameters such as system suitability, linearity, precision, accuracy, specificity, robustness, and solution stability.The demonstrated excellent linearity over a concentration range of 40% to 160% with correlation coefficients close to 1. Precision studies showed low %RSD values, indicating high repeatability and reproducibility. Accuracy confirmed good recovery within acceptable limits. No interference from excipients or degradation products was observed, proving the specificity of the method. Stability studies indicated that both standard and sample solutions remained stable under defined conditions. the validated method was found to be robust, accurate, and suitable for routine quality control analysis of tofacitinib oral suspension formulations.

Keywords: acitinib; Sodium benzoate; HPLC; Method validation; Oral suspension; Assay method; Linearity; Precision; Accuracy; Specificity; Robustness; Solution stability; Pharmaceutical analysis; Quality control

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APP ABSTRACT - APP 2026 - 257

COMPARATIVE EVALUATION OF ANALYTICAL TECHNIQUES FOR THE CHARACTERIZATION AND QUANTIFICATION OF SEMAGLUTIDE: RECENT ADVANCES AND FUTURE PERSPECTIVES.

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ABSTRACT:

Semaglutide, a long-acting agonist of the glucagon-like peptide-1 (GLP-1) receptor, is widely used as an effective therapeutic option in the management of type 2 diabetes mellitus and obesity. As a peptide-based drug with a complex pharmacokinetic profile, it requires appropriate analytical techniques for its characterization, quantification, and quality assessment in biological matrices and pharmaceutical formulations. The present review outlines the chemical composition, physicochemical characteristics, pharmacokinetics, pharmacodynamics, along with the discovery and development of semaglutide. The methods of analysis employed to identify and describe semaglutide are paid special attention. The existing chromatographic and mass spectrometric procedures such as HPLC, UPLC, LCMS, and LCMSMS are all addressed with regards to sensitivity, selectivity, and application in the pharmaceutical and bioanalytical studies in entirety. The recent developments of the area of the analysis techniques are also mentioned, such as impurity profiling, peptide mapping, stability-indicating methods, and high-resolution mass spectrometry techniques. The paper also compares the mainstream chromatographic methods that were used to examine semaglutide and isolates the significant problems with the analysis that are linked to the peptide-based therapies such as interference with the matrix, stability problems and tedious sample preparation. Moreover, pharmaceutical quality, pharmacokinetic, formulation development and clinical monitoring analytical methods are described. Furthermore, emerging advancements in analytical technologies, novel drug delivery approaches, and future prospects of semaglutide therapy are also discussed. In , this review provides a comprehensive analytical overview of semaglutide and highlights the importance of advanced analytical techniques in ensuring its safety, efficacy, and therapeutic performance.

Keywords: Peptide therapeutics; GLP-1 receptor agonist; Semaglutide; Chromatographic analysis; HPLC; LC–MS/MS

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APP ABSTRACT - APP 2026 - 258

DEVELOPMENT AND VALIDATION OF RP-HPLC METHODS FOR SACUBITRIL/VALSARTAN: A REVIEW

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ABSTRACT

Heart failure is a leading cause of illness and death worldwide. The FDA has approved Sacubitril/valsartan, an angiotensin receptor-neprilysin inhibitor, for treating heart failure. Sacubitril/valsartan is likely to become a promising anti-heart failure medication in the near future. This review focuses on the recesnt advancements in analytical techniques and optimization methods for estimating Valsartan and Sacubitril. Sacubitril (a neprilysin inhibitor) and valsartan (an angiotensin receptor blocker) are combined in a medication designed to reduce the risk of death and hospitalisation in individuals with certain types of chronic heart failure. Future research should disclose the of a multicenter, randomized, double-blind study comparing Entresto's effectiveness and safety to Valsartan's impact on cognitive function in patients with chronic heart failure and preserved ejection fraction. The reviewed literature clearly indicates that HPLC is a widely accessible method for testing in pharmaceutical laboratories.

Keywords: Reverse Phase High-Performance, Liquid Chromatography, Sacubitril/valsartan, Heart failure, Angiotensin receptor-neprilysin inhibitor

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APP ABSTRACT - APP 2026 - 259

FORMULATION AND EVALUATION OF MOUTH DISSOLVING TABLETS OF CARBAMAZEPINE

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Abstract:
Mouth dissolving tablets (MDTs) are advanced oral dosage forms designed to disintegrate rapidly in the oral cavity without the need for water, thereby improving patient compliance. This study aims to formulate and evaluate MDTs of carbamazepine to enhance its bioavailability and provide rapid drug action, especially for patients with swallowing difficulties.MDTs were prepared using the wet granulation technique. Superdisintegrants such as crospovidone, croscarmellose sodium, and sodium starch glycolate were incorporated in varying concentrations. Preformulation studies including organoleptic evaluation and solubility analysis were conducted. The prepared granules were compressed into tablets and evaluated for post-compression parameters including hardness, friability, weight variation, disintegration time, wetting time, water absorption ratio, uniformity of dispersion, and drug content. All formulations showed satisfactory physical characteristics within pharmacopoeial limits. Tablets containing optimized concentrations of superdisintegrants exhibited rapid disintegration, reduced wetting time, and improved dissolution profiles. The confirmed enhanced performance compared to conventional tablets.The study successfully demonstrates that MDTs of carbamazepine can be effectively formulated with improved patient compliance, faster onset of action, and enhanced bioavailability. These tablets represent a promising alternative to conventional oral dosage forms, particularly for geriatric and paediatric patients.

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APP ABSTRACT - APP 2026 - 260

CHARACTERIZATION OF RISEDRONATE SODIUM ORO DISPERSIBLE FILM USING NATURAL SUPER DISINTEGRANT: A COMPARATIVE STUDY WITH SODIUM STARCH GLYCOLATE

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ABSTRACT

The study aimed to develop and evaluate Risedronate sodium Oro dispersible films using Mimosa pudica seed mucilage as a natural super disintegrant and compare its performance with Sodium Starch Glycolate. The objectives are drug and polymer selection, compatibility studies, formulation development, in vitro evaluations, and stability studies to assess the feasibility of using natural polymers in Oro dispersible films.Oro dispersible films were prepared using the solvent casting method. The formulations contained Risedronate sodium, Hydroxypropyl methylcellulose (HPMC K4M) as the film-forming polymer, and either Mimosa pudica mucilage or Sodium Starch Glycolate as the super disintegrant. Various formulations were studied (F_1 -F_6) to optimize film characteristics. The films were evaluated for physical properties, disintegration time, dissolution rate, drug content uniformity, and stability under different environmental conditions. Among the formulations, F3 and F6 exhibited the best performance, with rapid disintegration times of 49 and 48 seconds, respectively. In vitro dissolution studies showed that both formulations achieved over 99% drug release within 10 minutes. The comparative Study indicated that Mimosa pudica seed mucilage performed similarly to Sodium Starch Glycolate in enhancing drug release and film disintegration. One month are performed and Stability studies confirmed that the films remained stable under various conditions. The study concluded that Mimosa pudica seed mucilage is a promising natural super disintegrant for Oro dispersible films, offering an effective alternative to synthetic excipient Sodium starch glycolate. However Further in vivo studies are required to validate drug release bioavailability and therapeutic efficacy.

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APP ABSTRACT - APP 2026 - 261

APPLICATION OF ANALYTICAL QUALITY BY DESIGN (AQBD) IN UHPLC METHOD DEVELOPMENT FOR PHARMACEUTICAL ANALYSIS

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ABSTRACT:

Analytical Quality by Design (AQbD) has emerged as a systematic and scientific approach for the development of robust and reliable analytical methods in pharmaceutical analysis. Unlike traditional trial-and-error methods, AQbD emphasizes understanding method variables, risk assessment, and design space establishment to ensure consistent analytical performance. Ultra High-Performance Liquid Chromatography (UHPLC) plays a vital role in modern pharmaceutical analysis due to its high resolution, sensitivity, and reduced analysis time. The integration of AQbD with UHPLC enhances method optimization by employing statistical tools such as Design of Experiments (DoE), enabling the identification of critical method parameters and their impact on analytical outcomes. This approach ensures improved method robustness, regulatory flexibility, and lifecycle management. Additionally, AQbD-based methods comply with regulatory expectations by providing better control over variability and ensuring data reliability. Recent advancements highlight the growing importance of AQbD in impurity profiling, stability studies, and quantitative drug analysis.In , the implementation of AQbD in UHPLC represents a significant advancement in pharmaceutical analytical sciences, offering a systematic pathway for developing efficient, reproducible, and regulatory-compliant analytical methods.

KEYWORDS: Analytical Quality by Design (AQbD), UHPLC, Design of Experiments (DoE), Method Validation, Pharmaceutical Analysis.

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APP ABSTRACT - APP 2026 - 262

DESIGN AND NOVEL SYNTHESIS OF SCHIFF BASE DERIVATIVE FOR ANTI VIRAL ACTIVITY

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Abstract:
Schiff base derivatives are widely recognized for their significant biological activities, including antiviral properties. The present study focuses on the design and novel synthesis of a Schiff base derivative aimed at evaluating its antiviral potential. The compound was synthesized via condensation reaction between a selected aldehyde and primary amine under optimized reaction conditions. The synthesized derivative was purified and characterized using various analytical techniques such as UV-Visible spectroscopy, Infrared (IR) spectroscopy, and Nuclear Magnetic Resonance (NMR) analysis to confirm its structure. The antiviral activity of the synthesized compound was assessed against selected viral strains using standard in vitro methods. The indicated notable inhibitory activity, suggesting its effectiveness in preventing viral replication. The structure–activity relationship highlights the importance of functional groups in enhancing antiviral efficacy. Overall, this study suggests that the newly synthesized Schiff base derivative holds promise as a potential lead compound for further development of safe and effective antiviral agents.

Keywords: Schiff base derivatives, Antiviral activity, Novel synthesis, Condensation reaction, Spectroscopic characterization, Structure–activity relationship, Drug design, In vitro studies

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APP ABSTRACT - APP 2026 - 263

MULTI DRUG- RESISTANT TUBERCULOSIS: CHALLENGES AND EMERGING THERAPEUTIC STRATEGIES

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Abstract: Multi drug- resistant tuberculosis (MDR-TB) and extensively drug-resistant tuberculosis (XDR-TB) pose serious global health challenges, limiting the effectiveness of conventional anti-tuberculosis therapy. While drug-susceptible tuberculosis shows treatment success rates of approximately 85%, MDR-TB outcomes remain significantly lower at 50–60%. This systematic review aims to evaluate recent advances in therapeutic strategies for drug-resistant tuberculosis, focusing on novel and repurposed drugs, their mechanisms of action, clinical efficacy, and overall treatment outcomes.

A comprehensive literature search was conducted using PubMed, Embase, Cochrane Library, and Web of Science databases up to December 2024. Peer-reviewed articles, randomized controlled trials, systematic reviews, and meta-analyses were included. Data extraction focused on drug mechanisms, clinical effectiveness, safety profiles, and emerging resistance patterns associated with newer therapeutic agents.

Analysis of 125 studies and 15 ongoing clinical trials demonstrated significant improvements in MDR-TB management. Novel drugs such as bedaquiline, delamanid, and pretomanid achieved higher treatment success rates ranging from 73% to 90% compared to conventional second-line therapies. The BPaL regimen (bedaquiline, pretomanid, and linezolid) showed favorable outcomes of up to 90% within a shortened treatment duration of 6 months. However, increasing resistance to newer drugs, particularly bedaquiline, remains a growing concern in high-burden regions.

In , emerging therapies have transformed MDR-TB treatment by enabling shorter, more effective regimens, though continuous monitoring and innovation are essential.

Keywords: MDR-TB,XDR-TB, Bedaquiline ,Delamanid ,Pretomanid, Drug resistance

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APP ABSTRACT - APP 2026 - 264

PRELIMINARY STEP TOWARDS DRUG RECYCLING: COMPARATIVE ANALYSIS OF EXPIRED AND UNEXPIRED AZITHROMYCIN ANTIBIOTIC ACTIVITY

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Abstract:

This study investigates drug recycling by comparing antimicrobial activity of expired and unexpired Azithromycin. Using the well diffusion method, efficacy was measured through zones of inhibition. showed expired Azithromycin retained comparable activity, suggesting some antibiotics remain effective beyond expiration. This opens possibilities for repurposing in fields like agriculture. The study emphasizes sustainable approaches to reduce pharmaceutical waste, though further research is needed to confirm safety and stability.Sterile swabs were prepared and sterilized. Wells of 6 mm diameter were made aseptically. Antibacterial activity was tested using the agar well diffusion method on Muller Hinton Agar. Plates were inoculated with bacterial suspension and dried. Drug solutions (20 µl) were added into wells and incubated at 37°C for 24 hours. Zones of inhibition were measured to compare activity.Expired and unexpired Azithromycin were tested against bacterial strains. Zones of inhibition showed comparable activity, with slight variations. Unexpired samples showed marginally higher inhibition in some cases. Both Gram-positive and Gram-negative bacteria responded similarly, indicating retained antibacterial efficacy.Expired Azithromycin shows potential for reuse in non-clinical applications, supporting sustainable waste management. Further studies are required to evaluate safety, stability, and effectiveness before practical implementation.

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APP ABSTRACT - APP 2026 - 265

EVALUATION OF ANTI DIARRHEAL ACTIVITY OF GLUCOSINOLATES IN RATS

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ABSTRACT

Diarrhea remains a significant global health concern, necessitating the exploration of novel and effective therapeutic agents. Glucosinolates, bioactive compounds found in cruciferous vegetables, have demonstrated various pharmacological properties, including anti-inflammatory and antimicrobial effects. This study evaluates the anti-diarrheal activity of glucosinolates in Wistar rats. Diarrhea was induced using castor oil, and the protective effect of glucosinolates was assessed through parameters such as fecal output. demonstrated a significant reduction in diarrheal episodes in glucosinolate-treated groups compared to the control. The treatment effectively decreased fecal frequency, reduced intestinal transit, and minimized fluid loss, highlighting its potential in modulating gut motility and secretion. Histopathological examination of intestinal tissues revealed a protective effect, supporting the anti-inflammatory properties of glucosinolates. These findings suggest that glucosinolates possess potent anti-diarrheal activity, possibly through their influence on gastrointestinal motility and secretion mechanisms. Their natural origin and safety profile make them promising candidates for developing alternative anti-diarrheal therapies. Further research is warranted to elucidate the precise mechanisms and clinical relevance of these findings.

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APP ABSTRACT - APP 2026 - 266

IMPACT OF DIGITAL REMINDER-BASED INTERVENTION ON GLYCEMIC CONTROL IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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ABSTRACT:

Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder that requires continuous medication adherence and regular monitoring to maintain optimal glycemic control. Poor adherence to antidiabetic therapy often leads to uncontrolled blood glucose levels and increased risk of complications. Digital health interventions such as mobile phone reminders and WhatsApp messages have emerged as cost-effective and accessible tools to support patient compliance and improve treatment outcomes. Digital reminder-based interventions provide timely alerts for medication intake, lifestyle modification, and follow-up visits, thereby enhancing patient awareness and engagement in diabetes management. The use of mobile health technologies can significantly contribute to better glycemic control and improved quality of life among T2DM patients. Hence, digital reminder-based interventions can be considered as a supportive strategy in routine clinical practice for effective diabetes management.

KEY WORDS :

T2DM, Digital Reminder, Glycemic Control, WhatsApp, mHealth

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APP ABSTRACT - APP 2026 - 267

FIBRIC ACID DERIVATIVES FOR ANTIHYPERLIPIDEMIC TREATMENT

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Abstract:

Fibric acid derivatives, or fibrates, are a class of medications used primarily to manage dyslipidemia, which is characterized by abnormal lipid levels in the blood. These drugs are particularly effective at lowering triglyceride levels and increasing high-density lipoprotein (HDL) cholesterol, which is often referred to as"good" cholesterol. Experimental methods for evaluating fibric acid derivatives, or fibrates, typically involve several stages to assess their efficacy, safety, and mechanism of action. These methods include invitro studies. In invitro studies Fibric acid derivatives are tested on cultured cells to study their effects on lipid metabolism, gene expression, and receptor activation. Animal Models: Preclinical Trials: Animal studies are used to evaluate the pharmacokinetics (absorption, distribution, metabolism, and excretion), pharmacodynamics (biological effects), and potential side effects of fibrates. These models help in assessing the impact of the drugs on lipid levels and overall health before human trials. Fibric acid derivatives, or fibrates, are an important class of medications used primarily to manage dyslipidemia, characterized by elevated triglyceride levels and low high-density lipoprotein (HDL)cholesterol. They are effective in lowering triglycerides and raising HDL cholesterol, thus reducing the risk of cardiovascular diseases. Fibrates work by activating peroxisome proliferator-activated receptor alpha(PPAR-alpha), which enhances fatty acid oxidation and modifies lipid metabolism.

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APP ABSTRACT - APP 2026 - 268

FROM METHOD DEVELOPMENT TO VALIDATION: RP-HPLC STRATEGIES FOR LENACAPAVIR AND ITS COMBINATIONS- A REVIEW

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Abstract Reverse Phase High-Performance Liquid Chromatography (RP-HPLC) remains a cornerstone technique in pharmaceutical analysis for antiviral agents special emphasises on lenacapavir and its combinations. This review summarizes recent trends (past ~5 years) in method development and validation by RP-HPLC for antiviral drugs, covering column technologies, mobile phase strategies, detection options, sample preparation, automation, and regulatory-aligned validation practices. Special focus is given to multi-analyte methods, hyphenated techniques, green analytical chemistry, and challenges in sensitivity and matrix complexity. The article concludes with future directions to guide analysts and quality control laboratories.

Keywords: HIV-1, HIV therapy, capsid inhibitor, antiretroviral therapy (ART), combinations, long-acting therapy

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EFFECT OF WHATSAPP-BASED MEDICATION REMINDERS ON MEDICATION ADHERENCE IN T2DM PATIENTS

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ABSTRACT:
This study evaluates the effect of WhatsApp-based medication reminders on improving medication adherence among patients with Type 2 Diabetes Mellitus (T2DM). Poor adherence to antidiabetic therapy is a major barrier to effective glycemic control and increases the risk of complications. In this intervention, patients received regular reminders through WhatsApp, including medication alerts, lifestyle tips, and follow-up messages. Adherence levels were assessed before and after the intervention using standardized tools such as the Morisky Medication Adherence Scale. indicated a significant improvement in adherence scores among participants receiving reminders compared to baseline. The use of mobile-based communication proved to be a cost-effective, accessible, and user-friendly strategy to enhance patient engagement. The findings suggest that integrating digital health tools like WhatsApp into routine diabetes care can support better treatment outcomes and reduce long-term complications associated with poor adherence in T2DM patients.

KEYWORDS:
Type 2 Diabetes Mellitus (T2DM),Medication Adherence,WhatsApp Reminders,Mobile Health (mHealth),Digital Health Intervention,Patient Compliance

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APP ABSTRACT - APP 2026 - 270

FORMULATION AND EVALUATION OF A BIO-ACTIVE ANTI-ACNE SERUM

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Abstract:

Acne vulgaris is a chronic inflammatory skin condition caused by Propionibacterium acnes. While synthetic treatments are common, they often cause side effects like dryness or antibiotic resistance. This study explores the therapeutic potential of Cow Urine (Gomutra), traditionally recognized for its antibacterial, antifungal, and antioxidant properties. The goal was to formulate a stable, effective serum that leverages these natural bio-active compounds to reduce acne lesions. Collection & Purification: Fresh cow urine was collected and subjected to photo-fractionation and distillation to obtain a clear, odorless distillate.The serum was developed using the distillate as the active base, combined with a gelling agent (Carbopol 940), humectants (Glycerin), and natural preservatives.The formulation was tested for: Physicochemical Parameters: pH, viscosity, and spreadability.

Antimicrobial Activity: Using the disc diffusion method against S. aureus and P. acnes.

Stability: Accelerated stability studies at varying temperatures.The formulated serum exhibited a skin-compatible pH of 5.5 to 6.2 and excellent spreadability. Antimicrobial assays showed a significant zone of inhibition (14–18mm), suggesting the distillate effectively inhibits acne-causing bacteria. Stability testing confirmed the serum maintained its consistency and potency over a 90-day period without phase separation.The study successfully demonstrates that a cow urine-based serum is a viable, eco-friendly alternative to synthetic anti-acne products. The formulation is stable, non-irritating, and possesses strong antibacterial properties, paving the way for further clinical trials in natural dermatology.

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APP ABSTRACT - APP 2026 - 271

DESIGN AND NOVEL SYNTHESIS OF SCHIFF BASE DERIVATIVE FOR ANTIMICROBIAL ACTIVITY

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Abstract:
Schiff base derivatives have emerged as significant compounds in medicinal chemistry due to their diverse pharmacological properties, particularly their antimicrobial potential. In this study, a novel series of Schiff base derivatives was rationally designed and synthesized through condensation reactions between various substituted aromatic aldehydes and primary amines. The synthesis was carried out under mild conditions, yielding stable imine-linked compounds with good efficiency. Structural characterization of the synthesized molecules was accomplished using spectroscopic techniques such as FTIR, ^{1}H NMR, and mass spectrometry, confirming the formation of the azomethine (–C=N–) functional group. The antimicrobial activity of these compounds was evaluated against a panel ofGram-positive and Gram-negative bacteria, along with selected fungal strains, using standard in vitro assays. indicated that several derivatives exhibited significant antimicrobial activity, in some cases comparable to standard drugs. Structure–activity relationship analysis suggested that the presence of electron-donating and electron-withdrawing substituents on the aromatic ring played a crucial role in enhancing biological efficacy. Overall, this study demonstrates that Schiff base derivatives represent promising scaffolds for the development of new and effective antimicrobial agents.

Keywords: Schiff base derivatives, Antimicrobial activity, Novel synthesis, Aromatic aldehydes, Primary amines, Azomethine group, Structure–activity relationship (SAR), Spectroscopic characterization, Bioactive compounds, Drug development.

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APP ABSTRACT - APP 2026 - 272

A SYSTEMIC REVIEW ON ACUTE EPIGLOTTITIS: CLINICAL FEATURES AND DIAGNOSIS.

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ABSTRACT

Acute epiglottitis (AE) is an acute inflammatory life-threatening clinical condition which can lead to obstruction of the airway. AE is a bacterial infection of the supraglottic structures. Breathing difficulties are often thought of as a strong predictor of the intervention to the airway. AE is considered an emergency due to the chance for airway narrowing. Clinical presentations are alone insufficient for the diagnosis of AE. Fibreoptic nasopharyngolaryngoscopic examination should be performed as soon as possible for confirmation of diagnosis. As AE is a life-threatening infection, it warrants immediate diagnosis and treatment. Antibiotics are the mainstay of the initial treatment along with corticosteroids which act as potential adjuncts. This review article describes the aetiopathology, epidemiology, clinical presentations, diagnosis and current treatment of AE. A multidisciplinary approach and immediate therapeutic measures are imperative to ensure the safety of the airway through basic and invasive procedures, in addition to strict postprocedural follow-up. This approach is fundamental to optimize health outcomes among these patients. Early diagnosis and prompt management of epiglottitis are critical to prevent severe complications. Increased awareness and timely intervention significantly improve patient outcomes.

KEYWORDS

Acute epiglottis, Upper Air Ways Obstruction, Laryngeal, Major salivary glands

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APP ABSTRACT - APP 2026 - 273

COMPARATIVE EFFICACY OF LAMOTRIGINE, VALPROATE SODIUM, AND LEVETIRACETAM FOR MANAGING IDIOPATHIC GENERALISED TONIC-CLONIC SEIZURES IN ADULTS"

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Abstract

Idiopathic generalized tonic-clonic seizures (GTCS) are a common form of epilepsy that require long-term antiepileptic therapy to reduce seizure frequency, prevent complications, and improve quality of life. Among the available antiepileptic drugs (AEDs), lamotrigine (LTG), sodium valproate (VPA), and levetiracetam (LEV) are widely used in clinical practice. However, differences in efficacy, tolerability, and safety profiles necessitate a comparative evaluation to guide optimal treatment selection.

Methods:

A systematic review of literature was conducted using medical databases, including randomized controlled trials, meta-analyses, and observational studies published over the past 20 years. Relevant studies comparing lamotrigine, sodium valproate, and levetiracetam in adult patients with GTCS were analyzed to assess efficacy, safety, and tolerability outcomes.

The analysis indicates that sodium valproate demonstrates the highest efficacy as monotherapy for GTCS, with superior seizure control and higher seizure-free rates. However, its use is limited by adverse effects such as weight gain, tremor, metabolic disturbances, and significant teratogenic risks. Levetiracetam shows comparable efficacy with a favorable pharmacokinetic profile, fewer drug interactions, and better tolerability, though it may cause behavioral and neuropsychiatric side effects. Lamotrigine is generally well tolerated with fewer systemic adverse effects but exhibits comparatively lower efficacy in controlling generalized seizures.

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Sodium valproate remains the first-line treatment for GTCS due to its superior efficacy, but safety concerns require careful patient selection. Levetiracetam is a suitable alternative, particularly in patients at risk of valproate-related adverse effects, while lamotrigine may be considered in selected cases. Individualized treatment based on patient-specific factors is essential for optimal outcomes.

Keywords:
Idiopathic generalized tonic-clonic seizures, epilepsy, sodium valproate, levetiracetam, lamotrigine, antiepileptic drugs, seizure control, safety, tolerability, monotherapy

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APP ABSTRACT - APP 2026 - 274

DESIGN AND NOVEL SYNTHESIS OF SCHIFF BASE DERIVATIVE FOR ANTI INFLAMMATORY ACTIVITY

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Abstract:

This research focuses on the design, synthesis, and evaluation of coumarin Schiff basederivatives as potential anti-inflammatory agents with fewer side effects than traditional non-steroidal anti-inflammatory drugs (NSAIDs). NSAIDs are widely used but are associatedwith gastrointestinal and cardiovascular toxicity, creating a need for safer alternatives. In this study, four Coumarin-based compounds were designed and synthesized.Drug-likeness of the compounds was assessed using Lipinski's Rule of Five, confirming their suitability for oral use. Molecular docking studies were performed against thecyclooxygenase-2 (COX-2) enzyme to predict binding affinity and interaction patterns. All compounds showed better binding energy compared to the standard drug ibuprofen,indicating strong potential for anti-inflammatory activity. The synthesized compounds were further evaluated through an in vitro protein denaturation assay to measure anti-inflammatory effects. revealed that compounds 6 and 7 exhibited higher inhibition of protein denaturation than ibuprofen. Among them, compound 7 demonstrated the best overall performance, with the highest inhibition percentage and strong statistical correlation between concentration and activity. Although compound 8 showed excellent docking , its potential gastrointestinal side effects reduce its suitability as a lead compound. Overall, the study concludes that compound 7 is the most promising candidate for further development. Future research should focus on toxicity studies and clinical evaluation to confirm its safety and effectiveness.

Keywords: Coumarin, Schiff base derivatives, Anti-inflammatory activity, NSAIDs, Cyclooxygenase-2 (COX-2), Molecular docking, Drug design, Lipinski's Rule of Five, Protein denaturation assay, Binding affinity, Lead compound

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APP ABSTRACT - APP 2026 - 275

SYNTHESIS AND CHARACTERIZATION OF CHALCONE DERIVATIVES A COMPARATIVE EVALUTION OF NAOH AND KOH

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Abstract:

Chalcones, named by Kostanecki and Tambor, exhibit diverse biological activities including antibacterial, antifungal, anti-inflammatory, and anticancer effects due to their α, β-unsaturated system. They are synthesized by Aldol condensation using conventional and microwave methods. Compounds are purified by recrystallization or chromatography and characterized by melting point, TLC, UV, and IR spectroscopy to confirm structure, purity, and pharmacological potential.Chalcone derivatives were synthesized by Claisen-Schmidt condensation using conventional and microwave-assisted methods with NaOH or KOH catalysts. Products were purified by recrystallization. Thin Layer Chromatography was used for separation and Rf determination. UV spectroscopy measured absorbance and λmax for quantitative analysis. IR spectroscopy (ATR-FTIR) identified functional groups, confirming structure and purity of synthesized chalcone compounds.Chalcones derivatives were synthesized through Conventional method and Microwave Assisted Technique. The most efficient yield was obtained from Microwave Assisted Technique.Chalcone derivatives were synthesized using sodium hydroxide and potassium hydroxide as catalysts through a microwave-assisted technique. The compounds were evaluated using Thin Layer Chromatography and UV spectroscopy, while UV-Visible and IR spectroscopy confirmed their structure and functional groups. TLC helped assess purity and separation. indicated that KOH was more effective than NaOH, producing higher yields and purer products. The synthesized derivatives showed promising anticancer, anti-inflammatory, and antimicrobial therapeutic activities.

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APP ABSTRACT - APP 2026 - 276

PRELIMINARY STEP TOWARDS DRUG RECYCLING: COMPARATIVE ANALYSIS OF EXPIRED AND UNEXPIRED AZITHROMYCIN ANTIBIOTIC ACTIVITY

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Abstract:

This study investigates drug recycling by comparing antimicrobial activity of expired and unexpired Azithromycin. Using the well diffusion method, efficacy was measured through zones of inhibition. showed expired Azithromycin retained comparable activity, suggesting some antibiotics remain effective beyond expiration. This opens possibilities for repurposing in fields like agriculture. The study emphasizes sustainable approaches to reduce pharmaceutical waste, though further research is needed to confirm safety and stability.Sterile swabs were prepared and sterilized. Wells of 6 mm diameter were made aseptically. Antibacterial activity was tested using the agar well diffusion method on Muller Hinton Agar. Plates were inoculated with bacterial suspension and dried. Drug solutions (20 µl) were added into wells and incubated at 37°C for 24 hours. Zones of inhibition were measured to compare activity.Expired and unexpired Azithromycin were tested against bacterial strains. Zones of inhibition showed comparable activity, with slight variations. Unexpired samples showed marginally higher inhibition in some cases. Both Gram-positive and Gram-negative bacteria responded similarly, indicating retained antibacterial efficacy.Expired Azithromycin shows potential for reuse in non-clinical applications, supporting sustainable waste management. Further studies are required to evaluate safety, stability, and effectiveness before practical implementation.

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APP ABSTRACT - APP 2026 - 277

Anti-Arthritic Mechanisms of Alstonia scholaris: Integrative Network Pharmacology, Docking, and MM/GBSA QbD Analysis for Extraction

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Abstract

Rheumatoid arthritis (RA) is a progressive autoimmune disorder driven by dysregulated cytokine signalling, with tumour necrosis factor-α (TNF-α) serving as a central mediator of chronic inflammation and joint destruction. Although modern biologics have improved clinical outcomes, their adverse effects and high cost highlight the need for alternative therapeutic strategies. *Alstonia scholaris* is a medicinal plant rich in alkaloids, triterpenoids, lignans and phenolic compounds with reported anti-inflammatory potential; however, its molecular relevance to RA remains unclear. In this study, an integrated in-silico framework combining network pharmacology, molecular docking, and MM/GBSA free-energy calculations was used to clarify the potential anti-arthritic actions of phytochemicals derived from A. scholaris. Network pharmacology identified 14 overlapping targets between plant constituents and RA-associated genes, with TNF emerging as the principal hub. Docking analysis revealed that alstolactone A and pinoresinol exhibit strong affinity for TNF-α, engaging key hydrophobic residues that contribute to cytokine stability and receptor binding. MM/GBSA refinement supported pinoresinol as the most energetically stable binder, while 8-hydroxypinoresinol showed moderate stability and strictamine displayed a weaker binding profile. Although alstolactone A produced an anomalous MM/GBSA value, its favourable docking behaviour suggests potential activity pending recalculated energetics. Overall, the findings highlight pinoresinol and alstolactone A as promising phytochemical candidates capable of modulating TNF-α-mediated inflammation, offering mechanistic support for the traditional use of A. scholaris in inflammatory conditions and its potential relevance in RA treatment.

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APP ABSTRACT - APP 2026 - 278

ANALYTICAL METHOD DEVELOPMENT AND VALIDATION FOR THE ESTIMATION OF SUCRALFATE, METRONIDAZOLE & LIDOCAINE HCl IN SEMI-SOLID DOSAGE FORM

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ABSTRACT

Anal fissures, painful tears in the anus lining, can significantly impact a person's standard of living. Lidocaine, metronidazole, and sucralfate are effective treatments for anal fissures. Metronidazole lowers inflammation, sucralfate creates a barrier of defence, and lidocaine stops pain signals. These drugs may assist manage anal fissures, however depending on individual requirements, healthcare professionals should be consulted. One sensitive analytical method for analysing drug combinations is High Performance Liquid Chromatography (HPLC). Although the exact mode of action of sucralfate in treating duodenal ulcers is still unknown, it has been demonstrated to promote tissue healing and lower stomach juice pepsin activity, The Titrimetric method is used for the estimation of Sucralfate as Aluminium. Using reversed-phase technology on a C18 column, Sucralfate and Oxetacaine. The mean yields for sucralfate and oxetacaine are 99–60 percent and 100–32 percent, respectively, demonstrating the specific accuracy of the method. After being validated according to ICH criteria, the method showed linearity within a concentration range of 20–100 µg/mL, with intraday and interday precision percent RSD values of 2%The method was also used to assess Lidocaine extraction processes from multiple pharmaceutical dosage forms and analyze those employing an RP-HPLC technology. The technique was simple, accurate, robust, affordable, repeatable, and suitable for measuring medications in transdermal gels. The proposed method can ensure the purity of Lidocaine and prilocaine in their external formulation.

Keywords: Sucralfate, Metronidazole, Lidocaine HCl, Titrimetric, RP-HPLC