Board of Research in Nuclear Sciences, Mumbai

Sponsored National Conference

on

"Ethics of AI: Challenges and Governance of Artificial Intelligence in Radio Pharmaceutical Research"

ABSTRACT BOOK

Organized By

Royal College of Pharmacy

Behind Pt. Ravi Shankar Shukla University,

Doomar Talab, Mohba Bazar, Tatibandh, Raipur (C.G.)

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Message from Chief Patron

I am happy to hear that Royal College of Pharmacy, Raipur, is organizing Board of Research in Nuclear Sciences (BRNS), Mumbai Sponsored Two days National Conference on a Theme **"Ethics of AI: Challenges and Governance of Artificial Intelligence in Radio Pharmaceutical Research"**.

This conference will surely benefit the scientific fraternity and researchers. I am sure that this occasion would be an excellent opportunity for the participants to share their views and commit themselves to work towards Radiopharmaceutical.

I extend my heartfelt greetings for the event and wish to the College for all the success in this Conference and in future endeavours.

Mr. Toshan Chandrakar
Chairman
Combined Academy of Technical Education

Message from Patron

I feel very delighted to share that Royal College of Pharmacy, Raipur, is organizing Board of Research in Nuclear Sciences (BRNS), Mumbai Sponsored Two days National Conference on a Theme **"Ethics of AI: Challenges and Governance of Artificial Intelligence in Radio Pharmaceutical Research"**.

I welcome all the guests, eminent resource persons, faculty of different colleges and students. This conference is a platform where participants would share and exchange their research and practical experiences and challenges in Regulatory framework of AI in Translation of Radiopharmaceutical.

Warm wishes for the grand success of this National Conference.

Mr. Kamal Chandrakar
Secretary
Combined Academy of Technical Education

Message from Convener

It is a proud privilege to share with you all that Royal College of Pharmacy, Raipur (CG), is organizing Board of Research in Nuclear Sciences (BRNS), Mumbai Sponsored two days National Conference on a Theme **"Ethics of AI: Challenges and Governance of Artificial Intelligence in Radio Pharmaceutical Research"**.

This conference aims to provide the platform to academicians, researchers of various fields like Pharmaceutical Science, Nuclear Science, Clinical Practice and other disciplines. It is intended to provide proper direction and vision to future research for the benefit of mankind.

I wish a grand success for this conference.

Dr. Deepak Kumar Dash
Principal
Royal College of Pharmacy, Raipur (CG)

About the Conference

The national conference is to be sponsor by Board of Research in Nuclear Sciences (BRNS), Mumbai on the theme "**Ethics of AI: Challenges and Governance of Artificial Intelligence in Radio Pharmaceutical Research**". Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think and act like humans. The use of AI in Radio Pharmaceutical research presents significant ethical challenges and necessaries robust governance frameworks. Key concern includes Data privacy, Potential for Bias, Transparency and the need for accountability, particularly regarding patient well-being and fair access to benefits. This conference aims to provide a platform to academicians, researchers to share and exchange their research and practical experiences and challenges in AI.

About The College At A Glance

Royal College of Pharmacy was established in the year 2004, by the society of Combined Academy of Technical Education, Raipur (C.G.). The institution has been approved by PCI, New Delhi and affiliated from Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G.). The institute is located at the heart of Raipur city at its own land with suitable infrastructure. It is well connected at 5 km distance from Raipur Railway Station. Other Institutions such as AIIMS, NIT, Pt. Ravishankar Shukla University are in close proximity to our institution. We are committed to provide quality pharmaceutical education for Degree, Diploma and PG Courses and PhD Research works. Well-equipped laboratory, library and an excellent team of experienced teaching faculty have made it one of the premier institutes in Chhattisgarh State.

Registration Detail

Category	Early Bird	On the Spot
Student	**Rs. 500**	**Rs.600**
Research Scholar	**Rs. 600**	**Rs. 700**
Academician	**Rs. 700**	**Rs. 800**
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Registration fees can be paid through :
Name of the Bank: ICICI Bank
IFSC Code- ICIC0002516
A/c Pay Name- Royal College of Pharmacy
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Call for Abstract

Abstracts are invited in the following category of -

- Nuclear Medicine
- Radiopharmaceutical
- Artificial Intelligence
- Cancer
- Drug Discovery
- Clinical Pharmacy and Pharmacovigilence
- Biotechnology and life Sciences

Note: Candidates should send the soft copy of abstract in MS Word format as an email attachment to **rcpseminarroyal@gmail.com**

Guidelines for Abstract

Abstracts must be submitted in the following format for paper presentations:
File Type: MS Word (docs)
Word Limit: 250 words (12 point, Times New Roman)
Title: 14 point, Bold, Times New Roman
Author's name should be with their affiliation, & email addresses (12 point, Bold, Times New Roman)
Name of the presenting Author must be underlined.
Size of the Poster: 120 cm height x 90 cm width

Board of Research in Nuclear Sciences, Mumbai

Sponsored National Conference

on

"Ethics of AI: Challenges and Governance of Artificial Intelligence in Radio Pharmaceutical Research"

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I hereby recommend Prof./Dr./Mr./Ms.....to attend two days BRNS Sponsored National Conference in the above institute.

Place: …… Date: ……

Signature and seal of Head of the Institute

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BRNS/RCP/25/P-01

BBB: Approach in Nanogel Delivery System

Dr. Subhasri Mohapatra[1]

Professor
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Abstract

Patients administrated many types of Nanogel drug delivery through systemic, pulmonary, nasal, parenteral, intra ocular route. Recently developed nanocarriers for the management of CNS diseases, range from more conventional formulations (e.g., liposomes, solid lipid nanoparticles, polymeric nanoparticles) to advanced formulations (e.g., nanocapsules, albumin, dendrimers, and nanogels). Among all, nanogels achieve a suitable drug pharmacokinetic profile, higher efficacy and safety compared with other nanocarriers. Modifying the carrier system with targeting ligands showed better trans-BBB (blood-brain barrier) efficiency. Nanogels can cross BBB and target tumor tissue in novel ways .Still research reviews fails to explain the exact role of this barrier in many cases, which proves itself the cause of hinderance to the chemotherapeutic drug accumulation in diseased tissue due to the low therapeutic index of nanogels. As the population ages, neurodegenerative disorders including Alzheimer's disease, Parkinson's disease, multiple lateral sclerosis, and stroke are on the rise. In 2020, the Central Brain Tumor Registry of the United States reported an overall primary malignant tumor incidence rate of 7.08 per 100,000, cases, about 55 million people (60% to 70%) worldwide with dementia are estimated to have Alzheimer's disease. To save human life from these life-threatening diseases, it's necessary to focus on nanogels as local and systemic drug delivery systems in the treatment of brain diseases. This review aims to provide the role of BBB on nanogel drug delivery.

Keywords: Nanogel, BBB, Neurodegenerative disorders, nanocarrier, BBB based nanogels

BRNS/RCP/25/P-02

Advancements in Molecular Marker Technologies and Their Applications in Diversity Studies

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Abstract

Since the dawn of agriculture nearly 10,000 years ago, humans have continuously worked to improve crops for better yield, quality, and adaptability. The process of domestication has brought significant genetic changes in plants, shaping modern agriculture and food production. However, challenges such as declining farmland, water scarcity, and growing environmental stress now demand the development of more resilient and productive crop varieties. Genetic diversity remains the cornerstone of plant breeding, offering essential traits for crop improvement. With the advent of advanced molecular tools like molecular markers and next-generation sequencing (NGS), scientists can now explore plant genomes in greater depth and identify genes linked to yield, nutrition, and stress tolerance. The integration of these technologies with phenotyping, proteomics, metabolomics, and association mapping has improved our understanding of genetic variation in crops. Furthermore, functional molecular markers (FMMs) and genotype-by-sequencing approaches have accelerated the identification of superior crop lines with desirable traits. These innovations have made crop breeding more accurate, efficient, and targeted. By combining traditional breeding knowledge with modern molecular techniques, researchers are paving the way for high-yielding, nutrient-rich, and stress-tolerant crops, ensuring sustainable agriculture and global food security for the future.

Keywords: Genetic diversity, Molecular markers, Next-generation sequencing (NGS), Functional molecular markers, Sustainable agriculture

BRNS/RCP/25/P-03

Formulation and Development of Cardiovascular Free Radical Scavenging Activity Herbal Syrup by Using DPPH Method

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Abstract

Recent survey, of WHO indicates coronary heart disease (CHD) alone accounts for more than half of the total mortalities associated with cardiovascular disease which is challenge to nutrionist and medical scientists. Dietary source are not sufficient to protect our body from free radicals so number of herbal formulation like Arjunarishta are available in market compliance. The aim of this work to develop liquid oral formulation using natural herbs are suitable for every age group with enhanced antioxidant & cardioprotective potential actively containing Arjuna, Spinach & chrysanthemum was developed then evaluated for its antioxidant activity by DPPH method simultaneously it's antioxidant activity were compared with marketed Arjunaristhta and standard Ascorbic acid. All the formulations have better antioxidant property than the marketed product. Percent radical scavenging activity for F1, F2 and F3 is found to be 76.1%, 78.4% and 88.6% respectively, which is more when compared with marketed herbal preparation e.g 74.7% also with ascorbic acid e.g 98.23%. F3 is effective in scavenging free radicals and has the potential to be a powerful antioxidant but cardioprotective activity was observed elevation in the activities of serum AST, ALT, and CK in ISO-control animals compared with normal animals due to the leaking of marker enzymes from a damaged myocardium into the bloodstream. Prepared oral formulations e.g F1, F2, F3 treatments to rats challenged with ISO significantly attenuated the elevated activities of the marker enzymes AST, ALT, and CK in serum than marketed preparation and only F3 was nearly cardioprotective value with marketed preparation.

Keywords: Cardioprotective herbals, DPPH, antioxidant, free radical, scavenging activity

BRNS/RCP/25/P-04

Computational Designing of Several Substituted (Z)-7-hydroxy-4-methyl-3-(3-phenylacryloyl)-2H-chromen-2-one (Chalcone) Derivatives Targeting the Inflammatory Enzyme Cyclooxygenase-1

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Abstract

Cyclooxygenase-1 (COX-1) is an essential enzyme involved in the production of prostaglandins, which regulate vital physiological processes such as gastric protection and platelet aggregation. However, over activity of COX-1 is linked to various inflammatory conditions, making it a target for anti-inflammatory drug development. Chalcones, a group of flavonoids, have emerged as potential COX-1 inhibitors due to their anti-inflammatory properties. This study explores the molecular docking of substituted (Z)-7-hydroxy-4-methyl-3-(3-phenylacryloyl)-2H-chromen-2-one (Chalcone) derivatives against COX-1. A series of these derivatives were designed and their interactions with the COX-1 enzyme were analyzed through in silico molecular docking using AutoDock Vina. The docking results revealed binding energy scores ranging from -7.0 to -8.5 Kcal/mol, indicating strong affinities for the COX-1 active site. Notably, the most potent derivatives formed stable hydrogen bonds and hydrophobic interactions with critical amino acid residues in the active site, suggesting effective COX-1 inhibition. These findings highlight the potential of Chalcone derivatives as selective COX-1 inhibitors. The study provides a promising foundation for the development of these compounds as novel anti-inflammatory agents. Further experimental validation, including in vitro and in vivo evaluations, will be necessary to confirm their therapeutic efficacy and safety profiles.

Keywords: COX-1, Inhibition, Docking, Anti-inflammatory agents.

BRNS/RCP/25/P-05

The Ethics of Using Artificial Intelligence in Medical Research

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Abstract

The integration of artificial intelligence (AI) technologies into medical research introduces significant ethical challenges that necessitate the strengthening of ethical frameworks. This review highlights the issues of privacy, bias, accountability, informed consent, and regulatory compliance as central concerns. AI systems, particularly in medical research, may compromise patient data privacy, perpetuate biases if they are trained on nondiverse datasets, and obscure accountability owing to their "black box" nature. Furthermore, the complexity of the role of Al may affect patients' informed consent as they may not fully grasp the extent of AI involvement in their care. Compliance with regulations such as the Health Insurance portability and Accountability Act and General Data Protection Regulation is essential, as they address liability in cases of AI errors. This review advocates a balanced approach to AI autonomy in clinical decisions, the rigorous validation of AI systems, ongoing monitoring, and robust data governance. Engaging diverse stakeholders is crucial for aligning AI development with ethical norms and addressing practical needs. Ultimately, the proactive management of AI's ethical implications is vital to ensure that its integration into healthcare improves patient outcomes without compromising ethical integrity.

Keywords: Artificial intelligence; ChatGPT; Compliance; Ethics; Social responsibility

BRNS/RCP/25/P-06

Phytochemical-Based Nanocarriers: A Promising Strategy for Colon Cancer Management

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Abstract

Colon cancer remains a major global health concern, with high morbidity and mortality rates. Conventional chemotherapeutic agents often exhibit systemic toxicity, poor bioavailability, and limited colon-specific action. Phytochemicals—bioactive compounds derived from plants such as curcumin, quercetin, and resveratrol—have demonstrated strong anticancer potential through multiple molecular mechanisms, including apoptosis induction and inhibition of tumor signaling pathways. However, their clinical application is limited due to low solubility and stability. Nanocarrier-based drug delivery systems offer a promising solution by enhancing the solubility, stability, and targeted delivery of phytochemicals to the colon. These nanoformulations enable controlled and localized drug release, reduce systemic toxicity, and improve therapeutic efficacy. This strategy integrates the benefits of natural compounds with advanced nanotechnology to develop sustainable and effective treatments for colon cancer.

Keywords: Phytochemicals, Colon Cancer, Nanocarriers, Targeted Drug Delivery, Anticancer Therapy

BRNS/RCP/25/P-07

A Prospective Study on the Safety Profile of Radiopharmaceuticals in Hospital Practice

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Abstract

Radiopharmaceuticals play a crucial role in diagnostic and therapeutic procedures in nuclear medicine. Although generally regarded as safe, their potential to cause adverse drug reactions (ADRs) highlights the importance of continuous Pharmacovigilance and the active involvement of clinical pharmacists to ensure patient safety. This prospective observational study was conducted over six months in the Department of Nuclear Medicine at a tertiary care hospital to assess the safety profile of radiopharmaceuticals used in hospital practice. All patients receiving diagnostic or therapeutic radiopharmaceuticals were observed for any adverse events, which were documented and evaluated for frequency, severity, and causality using standard assessment tools. Among 350 patients administered radiopharmaceuticals, 18 (5.1%) experienced ADRs. The most frequently implicated agents were Technetium-99m labeled compounds and Iodine-131. Commonly reported reactions included mild nausea, flushing, and localized pain at the injection site. All reactions were mild and self-limiting, with no serious or life-threatening events observed. Most ADRs were categorized as probable in causality. The timely intervention of clinical pharmacists contributed to early detection and appropriate management of these reactions. The findings indicate that radiopharmaceuticals have a favorable safety profile and are generally well tolerated. Strengthening Pharmacovigilance systems and promoting the active participation of clinical pharmacists can further enhance patient safety and ensure the rational and effective use of radiopharmaceuticals in clinical settings.

Keywords: Radiopharmaceuticals, Pharmacovigilance, Clinical Pharmacy, Adverse Drug Reactions, Nuclear medicine.

BRNS/RCP/25/P-08

Herbal Drug Delivery Systems in Modern Drug Discovery

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Abstract

Herbal drug delivery systems play a significant role in modern drug discovery by combining traditional plant-based medicines with advanced pharmaceutical technologies. Although many herbal compounds exhibit strong therapeutic potential, their clinical use is often limited due to poor solubility, low bioavailability, rapid degradation, and lack of target specificity. Modern drug delivery approaches such as nanoparticles, liposomes; phytosomes, nanoemulsions, and solid lipid nanoparticles help overcome these limitations by enhancing stability, improving absorption, and enabling controlled or targeted release. These systems not only increase the effectiveness of herbal constituents but also allow researchers to identify new lead molecules from natural sources more efficiently. Integrating innovative herbal delivery systems into the drug discovery pipeline supports the development of safer, more potent, and patient-friendly phytopharmaceuticals. As interest in natural therapies continues to grow, advanced herbal drug delivery platforms are becoming essential tools in designing novel therapeutic agents.

Keywords: Herbal drug delivery systems, nanoparticles, liposomes, phytosomes, nanoemulsions, phytopharmaceuticals.

BRNS/RCP/25/P-09

Drug Discovery through Computer-Aided Drug Design: A Modern Approach

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Abstract

Computer-Aided Drug Design (CADD) is a powerful tool used in modern pharmaceutical research to speed up the discovery of new medicines. By using computer-based models and simulations, scientists can study how potential drug molecules might interact with specific biological targets even before conducting laboratory experiments. CADD mainly uses two strategies—structure-based and ligand-based approaches—which help in analyzing protein structures, identifying key binding features, building pharmacophore models, and performing molecular docking studies. These methods make it possible to screen thousands of compounds virtually and predict their ADMET profiles early in the process. As a result, CADD helps reduce research time, minimize costs, and improve the efficiency of selecting and optimizing lead compounds. With ongoing technological improvements, CADD continues to transform drug discovery and support the development of safer and more effective therapeutic agents.

Keywords: Computer-Aided Drug Design, structure-based, ligand-based & molecular docking.

BRNS/RCP/25/P-10

CRISPR Technology in Disease Management

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Abstract:

CRISPR-Cas9 technology has rapidly advanced as a transformative genome-editing platform, facilitating precise genetic modifications and expanding therapeutic opportunities across various diseases. This review explores recent developments and clinical translations of CRISPR applications in oncology, genetic and neurological disorders, infectious diseases, immunotherapy, diagnostics, and epigenome editing. CRISPR has notably progressed in oncology, where it enables the identification of novel cancer drivers, elucidation of resistance mechanisms, and improvement of immunotherapies through engineered T cells, including PD-1 knockout CAR-T cells. Clinical trials employing CRISPR-edited cells are demonstrating promising results in hematologic malignancies and solid tumours. In genetic disorders, such as hemoglobinopathies and muscular dystrophies, CRISPR-Cas9 alongside advanced editors like base and prime editors show significant potential for correcting pathogenic mutations. This potential was affirmed with the FDA's first approval of a CRISPR-based therapy, Casgevy, for sickle cell disease in 2023. Neurological disorders, including Alzheimer's, ALS, and Huntington's disease, are increasingly targeted by CRISPR approaches for disease modelling and potential therapeutic intervention. In infectious diseases, CRISPR-based diagnostics such as SHERLOCK and DETECTR provide rapid, sensitive nucleic acid detection, particularly valuable in pathogen outbreaks like SARS-CoV-2.

Keywords: Immunotherapy, hemoglobinopathies , dystrophies, Casgevy, SARS-CoV-2.

BRNS/RCP/25/P-11

Formulation and Evaluation of Polymeric Nanoparticles of Felodipine

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Abstract

Felodipine, a calcium channel blocker, suffers from poor aqueous solubility and limited oral bioavailability, which restricts its therapeutic efficacy. To overcome these limitations, nanoparticle-based delivery systems provide a promising approach for enhancing solubility, stability, and sustained release. Felodipine-loaded polymeric nanoparticles were prepared using the nanoprecipitation method with PLGA as the polymer and PVA as the stabilizer. Preformulation studies, including organoleptic evaluation, FTIR, λ max determination, melting point, solubility, partition coefficient, and drug excipient compatibility, were carried out. The formulations (F1–F5) were characterized for physical appearance, particle size, zeta potential, SEM morphology, pH, drug content, entrapment efficiency, in vitro drug release, and stability studies under ICH conditions.

Keywords: Felodipine, Polymeric Nanoparticles, PLGA, Nanoprecipitation, Controlled Release, Oral Bioavailability.

BRNS/RCP/25/P-12

Formulation and Evaluation of topical herbal hand wash Gel Containing Cinnamon Oil

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Abstract

Hands are primary mode of transmission of microbes and infections. Hand-washing is critical in food production, food service and also important in healthcare setting, homes and day care preparations. The topical system a hand wash gel is created The pH, viscosity, drug content, stability study, skin irritation test, anti-microbial study and other properties of the prepared formulation are evaluated. Many emulgel hand wash cleanser is available in the market which could be challenging for present project work. The plan of the research was aimed to formulate evaluate the antibacterial efficacy of various herbal oils such as Cinnamon oil, Eucalyptus oil, menthol oil and lavender oil and found that cinnamon oil showed better antibacterial activity. Also the research was carried out to formulate and evaluate the poly herbal Hand wash gel containing Cinnamon oil. The anti-microbial activity of the formulated herbal hand wash gel was tested against Escherichia coli, and lactobacillus Salmonella by spread plate techniques and the results obtained were compared with commercial antibacterial standards. Also the efficiency was checked by using the hand wash gel on volunteers. The results from the present work suggest and support the incorporation and utilization of herbs in the formulations to give better effect.

Keyword: Cinnamon oil Emulgel, Topical Drug Delivery, Herbal hand wash gel, Antimicrobial activity and Cinnamon oil.

BRNS/RCP/25/P-13

Transformation of AI and Technology in Pharmaceutical Sector

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Abstract

The study was needed because traditional pharma methods are slow,costly and less patient-centric.AI and Technology can speed up research, improve education, drive innovation and empower patients and professionals, making healthcare more efficient and accessible. Specific Problems when relaying on AI are Incorrect Dosing and Treatments, Ignoring Patient-Specific Factors, Drugs Interactions and Side Effects, Over Reliance on AI, Data Privacy and Security Issues. The aim is to leverage AI and Technology in the pharmaceutical sector to educate stakeholders with data-driven insights, faster innovation in drug development and healthcare delivery, and empower patients, professionals and researchers for a more efficient and patient-centric system. This study provides an overview of various AI-Based Approaches utilized in Pharmaceutical Technology, highlighting their benefits and drawbacks.Nevertheless, the continued investment in and exploration of AI in the Pharmaceutical Industry offer exciting prospects for enhancing drug development processes and patient care. AI and Technology are transforming the pharmaceutical industry by enhancing education, driving innovation and empowering all stakeholders. They shorten drug development timelines; improve decision-making and enables personalized care. By integrating AI tools,pharma can become more efficient, inclusive in patient-centric, ensuring better healthcare outcomes for future.The Government of India launched the National Strategy
for AI (2018) under NITI Aayog, positioning AI as "AI FOR ALL".

Keywords: Artificial intelligence(AI), Smart Diagnostics, Automation, Big Data Analytics,
Drug Discovery.

BRNS/RCP/25/P-14

Artificial Intelligence in Nuclear Medicine: Opportunities, Challenges, and Responsibilities Toward a Trustworthy Ecosystem

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Abstract

Trustworthiness has always been a fundamental principle of medical practice. As the traditional patient–physician relationship transitions into a broader healthcare ecosystem, the emergence of artificial intelligence (AI) requires a re-evaluation of trust within this evolving landscape. AI is now becoming a significant component of nuclear medicine, with applications spanning diagnosis, therapy, and workflow optimization. Understanding its role in the context of technological revolutions is essential for ensuring its responsible and ethical integration.

Keywords: Artificial intelligence (AI); Nuclear medicine; Trustworthiness; Healthcare ecosystem; Diagnostic AI; Ethical deployment; AI governance.

BRNS/RCP/25/P-15

Ethical and Legal Challenges of Artificial Intelligence in Nuclear Medicine

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Abstract

Artificial intelligence (AI) has rapidly expanded within the field of nuclear medicine, emerging as a disruptive yet highly innovative technology. Advances in artificial neural networks, machine learning, and deep learning have introduced significant potential for improving workflow, productivity, clinical accuracy, and research efficiency. However, these developments also raise important ethical, legal, and social concerns, especially regarding data usage, algorithm design, and the reliability of automated decision-making in clinical practice. Therefore, strong governance and evidence-based regulation are essential for the safe and responsible application of AI in nuclear medicine.

Keywords: Artificial intelligence (AI); Nuclear medicine; Ethical issues; Legal challenges; Social implications; Algorithm governance; Transparency; Bias mitigation.

BRNS/RCP/25/P-16

Neuro-Oncology Theranostics: Bridging Nuclear Medicine and AI

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Abstract

This narrative explores the integration of theranostics and artificial intelligence (AI) in neuro-oncology, addressing the urgent need for improved diagnostic and treatment strategies for brain tumors, including gliomas, meningiomas, and pediatric central nervous system neoplasms. The evidence on novel theranostic agents such as Lu-177-based radiopharmaceuticals, CXCR4-targeted PET tracers, and multifunctional nanoparticles and highlights the role of AI in enhancing tumor detection, segmentation, and treatment planning through advanced imaging analysis, radiogenomics, and predictive modeling. It includes the emergence of nanotheranostics for targeted drug delivery and real-time monitoring, the application of AI-driven algorithms for improved image interpretation and therapy guidance, and the identification of current limitations such as data standardization, regulatory challenges, and limited multicenter validation. This concludes that the convergence of AI and theranostic technologies holds significant promise for advancing precision medicine in neuro-oncology, but emphasizes the need for collaborative, multidisciplinary research to overcome existing barriers and enable widespread clinical adoption.

Keywords: Theranostics; neuroradiology; artificial intelligence; brain tumor treatment; Nuclear medicine.

BRNS/RCP/25/P-17

Ethical and Governance Challenges of Artificial Intelligence in Radiopharmaceuticals Research

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Abstract

Radiopharmaceuticals are specialized class of drugs containing radioactive isotopes combined with biologically active molecules used for diagnostic and imaging and therapy. Currently over 100 radiopharmaceuticals available worldwide radio-nucleus mostly produced from nuclear reactors and cyclotrons. Radiopharmaceutical production involves handling of large quantites of radioactive substances and chemical processing. Radiopharmaceuticals are created using method such as producing radionuclides hrogh cyclotrons or generators, synthesizing compounds, and ten combining the radionuclide with the compound. after synthesis methods like chromatography (including SPE, HPLC,SEC and IEC) and liquid extraction are used to separate the desired product from any impurtites final product is a radiolabelled drug that must be carefully controlled for quality, sterility, and radioactivity before being dispensed and administered to patients In clinical imagining, Al enhances PET and SPCET reconstruction, reduces noise, and shortens acquisition times while maintaining diagnostic accuracy: For Imaging , the result is non – invasive pictures of the body 's organs and tissues Radionuclides have many applications in several areas which use nuclear energy. the importance and uses of radionuclides in medicine is continuously increasing for diagnosis and therapy of worldwide.

Keywords: Radiopharmaceutical,,molecular,patientcare,diagnostics,Radiolabelled, Radio synthesis.

BRNS/RCP/25/P-18

Application of Artificial Intelligence

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Abstract

The pharmaceutical industry is undergoing a significant transformation with the integration of Artificial Intelligence (AI) technology. As the industry continues to evolve, there is a growing need for innovative solutions to address complex challenges in drug discovery, development, and delivery and improving patient outcome. AI has the potential to revolutionize the pharmaceutical industry by enhancing education, driving innovation, and empowering professionals.Enhancing the learning of professionals and virtual experimentation aligning with ethical and regulatory guidelines. By leveraging AI-powered tools and platforms, pharmacists and researchers can access vast amounts of data, analyze complex information, and make informed decisions. To investigate the transformative potential of Artificial Intelligence (AI) technology in the pharmaceutical industry, with a focus on its role in educating professionals, driving innovation, and empowering decision-making. By Integration of AI into curricula, Hands-on training, online courses and resources, reduction of disruption in supply chain, certification program, interdisciplinary collaboration between academia, industry and government, support entrepreneurship. The integration of Artificial Intelligence (AI) technology in the pharmaceutical industry has the potential to revolutionize the way we approach education, innovation, and professional empowerment. By educating professionals, driving innovation, and empowering decision-making, AI can improve patient outcomes, streamline processes, and enhance the overall quality of care. AI is essential to address the complex challenges as the industry continues to evolve. By embracing AI technology, we can unlock new opportunities, drive growth, and create a brighter future for healthcare.

Keyword: Artificial intelligence (AI), Education, Innovation, Empower, Drug discovery, Development and Delivery.

BRNS/RCP/25/P-19

Digital Health Revolution in Artificial Medical science

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Abstract

The rapid evolution of digital health has significantly transformed the landscape of telehealth services, offering innovative solutions to enhance patient care and healthcare delivery. This study delves into the pivotal role of digital health technologies in telehealth, emphasizing their contribution to more effective, efficient, and accessible healthcare services. The focus shifts from a heavy reliance on AI and Large Language Models (LLMs) to a broader spectrum of digital health tools, including electronic health records, telemedicine platforms, mobile health applications, and data analytics. Through a systematic review of literature spanning from 2010 to 2020, this research highlights how digital health tools are reshaping patient-provider interactions, improving diagnostic accuracy, and promoting patient engagement and self-management. The findings indicate a significant positive impact of digital health on telehealth services, suggesting a future where technology-driven healthcare becomes more patient-centered and data-informed. This transition, while promising, also underscores the need for robust cybersecurity measures and addresses the challenges of integrating digital health tools into existing healthcare systems.

Keywords: LLMs, telemedicine, cybersecurity, digital health.

BRNS/RCP/25/P-20

Formulation and Evaluation of Celecoxib Emulgel

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Abstract

The present research is based on formulation of celecoxib emulgel and determines in-vitro drug release and swelling index of prepared emulgel. Pure drug of celecoxib was identified by using FTIR spectroscopy and preformulation study of emulgel was performed by using various methods like determination of lamba max, drug solubility studies, melting point of pure drug etc. The present formulation is based on carbapol 934 polymer and other key ingredient and excipients which was used in preparation of anti emulgel. Evaluated the prepared emulgel by their physical appearance, PH, Rheology, Swelling index, microscopic studies, Drug content, % drug release. In all formulation batch, F3 batch formulation was give satisfactory result like that drug content 95.3%, cumulative drug release 92.9 %. As a result, the current study's results unambiguously showed that celecoxib emulgel presents a promising alternative to the traditional dose form. Nevertheless, additional clinical research is required to evaluate the effectiveness of this technique. After taking into account everything mentioned above, it was determined that the current research study's goal could be effectively met.

Keyword: Emulgel, Celecoxib, Gel, Jelly,Celecoxib emulgel, Rheological emulgel Etc.

BRNS/RCP/25/P-21

Synthesis and Antimicrobial Evaluation of Some New Beta-lactam Dimer Compounds

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Abstract

Antimicrobial screenings are important tool to test and screen the inhibitory effect of newly synthesized compound against microorganisms before establishing their inhibitory spectra (narrow or broad). It is crucial to know the inhibitory spectra of antimicrobial compounds before their application in the field of medicine. The beta lactam ring is the main feature of the most of the Penicillin and other antibiotics. In the present project work a series of synthesis and antimicrobial evaluation of some new beta-lactam dimer compounds (3a-3d) and (4a-4d) respectively were synthesized by reaction of 1-(4-(4-(3-chloro-2-(4-nitrophenyl)-4oxocyclobutyl)phenyl)methyl)phenyl)-4-(4nitrophenyl)azetidin-2-one **(3)** with substituted Benzaldehyde using conventional method. The newly synthesized compounds were purified by recrystallization method using suitable solvent and characterized by physicochemical and spectral analysis (UV, IR, 1HNMR, 13CNMR, Mass spectroscopy and elemental analysis).

Keyword: Antimicrobial, Beta- lactum, Penicillin, UV, IR, NMR, Mass Spectroscopy.

BRNS/RCP/25/P-22

Drug Discovery in the Modern Age: Progress and Prospects

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Abstract

The advent of the modern era has also witnessed changes in drug discovery and the treatment and prevention of diseases. We are now more efficient due to the incorporation and implementation of multiple cutting-edge technologies in the drug discovery process,This abstract aims to summarize the recent advancements in drug discovery to develop new therapies, new frameworks to formulate and validate targets, and more. Structures and frameworks such as structure-based design, combinatorial chemistry, and in silicon modeling have advanced the discovery of new and promising compounds. Also, advancements in genomics and proteomics have enabled the identification of new drug targets. It also aims to identify the prospects of pioneering new advancements, especially in technologies that aim to transform the entire sector.

Keywords: Drug Discovery, Precision Medicine, Artificial Intelligence, High-Throughput Screening, Novel Therapeutics.

BRNS/RCP/25/P-23

Clinical Perspectives on the Detection and Management of Uterine Malignancies

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Abstract

The uterus is a hollow and pear-shaped organ in the pelvic area, located between the bladder and the rectum and covered by a tissue called the endometrium. The endometrium is made every month in the uterus, which is removed from the body during menstruation. Also, there are two tubes on both sides of the uterus, which are known as fallopian tubes. The task of these tubes is to release eggs and guide them into the uterus for fertilization. In the cervix. Uterine cancer is the most common cancer, recognized in the reproductive system of women. It is also known as endometrial cancer in clinical term. Cervical cancer occurs when cervical cells become abnormal and multiply rapidly. The cervix is a part of the female body that is located between the vagina and the uterus. Failure to diagnose or treat this cancer on time will definitely threaten a person's life. Cervical cancer is one of the most curable cancers. The necessary condition for the treatment of this cancer is to detect it on time and in the early stages. According to the report of the American Cancer Society, the higher the screening rate with pap smear tests, the lower the mortality from cervical cancer. Regular Pap smear tests are one of the most important and effective prevention methods to detect cells at risk of becoming cancerous. Getting the HPV vaccine and doing regular pap smear screenings can help you reduce the risk of cervical cancer.

Keywords: Cervix, HPV Vaccine, Pap Smear test

BRNS/RCP/25/P-24

Targeting Estrogen Receptors (ER) with Plant Bioactives: A Molecular Docking Approach for Breast Cancer Therapy

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Abstract

Breast cancer (BC) continues to be most common malignant neoplasm affecting women all over the world. The adverse effects of existing anti-cancer drugs as well as surgery are well known documented. Therefore, there is a pressing need to investigate safer, more effective alternative medicines with negligible or no side effects. Herbal approach suggests towards the utilization of traditional medicinal herbs to create medications derived naturally from plants. Many traditional herbs and their bioactives are still now unexplored. The plant bioactives exhibits anti-BC effects through a range of diverse mechanisms, including increase in apoptosis and induction of cell cycle arrest, the inhibition of BC cell proliferation, migration, metastasis, and angiogenesis. The progression of ER-α positive breast cancer is controlled by drugs like selective estrogen receptor modulators such as Tamoxifen. Long term therapy with Tamoxifen leads to resistance in body. Therefore, it is of interest to document the Molecular docking analysis of plant bioactives with ER-alpha. The work focuses on the docking of more than 20 selected plant bioactives against control in estrogen receptors to study the anti-breast cancer effects. The selected compounds were found to possess anticancer potential and could be considered as novel, cost-effective anticancer agents effective against ER positive breast cancer for further investigation.

Keywords: Breast cancer, Plant bioactives, Signaling pathways, Estrogen Receptor, (PI3K)

BRNS/RCP/25/P-25

A Recent Update on Indian Regulatory of Radio-Pharmaceuticals and Their Applications in Medicine

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Abstract

Radiopharmaceuticals involve the local delivery of radionuclides to targeted lesions for the diagnosis and treatment of multiple diseases. Their use is strictly regulated In India by the Atomic Energy Regulatory Board (AERB) and the Central Standard Drug Control Organization (CDSCO). With advancements in nuclear medicines globally, India's regulatory framework needs to strengthen with regulatory bodies harmonized with global standards, including Good Manufacturing Practices (GMP), Good Regulatory Practices (GRP), Good Laboratory Practices (GLP), Declaration of Helsinki, etc. Radiopharmaceutical therapy, which directly causes systematic and irreparable damage to targeted cells, has attracted increasing attention in the treatment of refractory diseases that are not sensitive to current therapies. Applications of radiopharmaceuticals in diagnostic imaging and therapy. We delve into the latest advancements in radiopharmaceutical design, synthesis, and application, including the development of novel isotopes, peptides, and antibodies. The article highlights the growing importance of Theranostics, immuno-PET, and alpha-particle therapy in cancer diagnosis and treatment, as well as their potential applications in neurology, cardiology, and infectious diseases. This review article aims to provide a roadmap for the future development and application of radiopharmaceuticals in diagnostic imaging and therapy, highlighting the vast potential of these innovative agents to revolutionize the field of nuclear medicine and improve patient outcomes.

Keywords: Radiopharmaceuticals, Nuclear medicine, Regulatory Framework, Application, Future Prospects

BRNS/RCP/25/P-26

Ethics of AI: Challenges and Governance of Artificial Intelligence in Radio Pharmaceutical Research

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Abstract :

The burgeoning integration of Artificial Intelligence (AI) into radiopharmaceutical research heralds a paradigm shift in clinical pharmacy and pharmacovigilance, promising to revolutionize diagnostics, drug development, and personalized patient care. However, this transformative potential is inextricably linked to complex ethical challenges that necessitate meticulous consideration and robust governance.The deployment of AI systems raises concerns about patient data privacy and confidentiality, particularly with vast datasets required for AI training. Mitigating algorithmic bias is crucial to ensure AI-driven insights are equitable and just across diverse patient populations, avoiding exacerbation of health disparities. The opacity of some AI models raises concerns about transparency and interpretability, paramount for clinical decision-making and patient trust.In pharmacovigilance, ethical implications extend to accountability when AI systems identify or miss adverse drug reactions. Establishing clear responsibilities for AI-generated errors is crucial. This abstract underscore the need for comprehensive AI governance frameworks, encompassing regulatory oversight, professional education, and defined responsibilities for AI developers and healthcare providers. Integrating ethical considerations from the inception of AI development is paramount. This proactive approach will enable AI's benefits while upholding patient safety, promoting health equity, and maintaining the highest ethical standards. The future of radiopharmaceutical research depends on addressing these challenges, ensuring AI enhances patient care while minimizing risks.

Key words: Paradigm shift, robust governance, clinical pharmacy and pharmacovigilance, accountability, health disparities.

BRNS/RCP/25/P-27

A review on: Antioxidant property containing Red Grapes of Herbal medicine for Breast Cancer

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Abstract

Breast cancer is a major cause of mortality among women worldwide, making the exploration of novel therapeutic strategies crucial. Among the various alternative treatments, herbal formulations have gained significant attention due to their therapeutic potential. This review focuses on the role of red grape, known for its antioxidant properties, in the prevention and management of breast cancer. The bioactive compounds found in red grapes, particularly resveratrol and polyphenols, exhibit potent anticancer effects through various mechanisms such as oxidative stress reduction, apoptosis induction, and inhibition of cancer cell proliferation. This article discusses the evidence supporting the inclusion of red grape in herbal formulations and its therapeutic potential in breast cancer treatment.

Keywords: Red Grape; Antioxidants; Breast Cancer; Oxidative Stress

BRNS/RCP/25/P-28

Role of AI in Pharmaceutical Product Development

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Abstract

Artificial intelligence (AI) has been making a significant impact in various industries, including the pharmaceutical sector. AI can greatly improve the product development process, making it faster, more efficient, and moe accurate. AI can help in this area by providing accurate data analysis, drug discovery, and drug development. AI can assist in discovering new drug targets and identifying new chemical compounds that can be used to treat specific diseases. AI algorithms can analyse vast amounts of data to identify new drug targets, predict side effects and interactions, and help to reduce the time and cost of the drug development process. AI can also help in optimizing the design of clinical trials and providing insights into patient populations. Implementation of AI can lead to better patient selection, improved patient outcomes, and increased efficiency in the drug development process. AI can also help in the optimization of drug manufacturing processes, leading to improved efficiency, better quality control, and reduced costs.use of AI in pharmaceutical product development has the potential to revolutionize the way drugs are developed and manufactured, making it faster, more efficient, and more effective.

Keywords: Artificial Intelligence (AI), Pharmaceutical product development, Drug discovery, Data analysis, Clinical trials.

BRNS/RCP/25/P-29

The Art and Science of Drug Discovery: Creating Tomorrows Cures

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Abstract

Drug discovery is the process of identifying and characterizing molecules with the potential to safely modulate disease, with a goal to bring medicines that can improve the lives of patients., Four phases of drug development. Drug development can be divided into four phases: discovery, preclinical studies, clinical development and market approval. the identify and develop new therapeutic agents (drugs) that can effectively treat diseases by interacting with specific biological targets. Drug discovery is the process of identifying, developing, and bringing new therapeutic agents to market to treat diseases. The journey begins with target identification**,** where scientists identify biological molecules (like proteins or enzymes) involved in a disease. Promising compounds are then tested in preclinical models (typically animal studies) to assess safety, toxicity, and effectiveness before advancing to human trials. In clinical trials**,** the drug undergoes three phases: Phase 1 focuses on safety, Phase 2 evaluates efficacy, and Phase 3 confirms effectiveness in larger populations. After approval, the drug enters the market, but post-market surveillance continues to track long-term safety and effectiveness in the general population. Drug discovery is a lengthy, costly process but crucial for developing new treatments and improving patient care. Drug discovery is a complex, transformative process that drives medical advancements, offering new treatments and hope for patients worldwide.

Keywords: lead optimization, target identification, preclinical development, hit discovery, regulatory approval.

BRNS/RCP/25/P-30

Artificial Intelligence (AI) in Pharmacy: A Review on Innovation

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Abstract

Artificial Intelligence (AI) emerged as an intervention for data and number-related problems. This breakthrough has led to several technological advancements in virtually all fields from engineering to architecture, education, accounting, business, health, and so on. AI has come a long way in healthcare, having played significant roles in data and information storage and management – such as patient medical histories, medicine stocks, sale records, and so on. It is rapidly transforming the pharmaceutical industries and pharmacy practice, driving innovation across the entire spectrum from drug discovery and development to patient care and optional efficiency. In general, AI is used for analysing machine learning to imitate the cognitive task of individual. AI technology is exercised to perform more accurate analyses as well as to ttain useful interpretation. In this perspective, various useful statistical models, as well as computational intelligence are combined in AI technology. AI is frequently applied to the development of digital computers or computer-controlled robots with the capacity to autonomously execute intellectual and cognitive human-like processes.

Keywords: Artificial Intelligence, Pharmacy, Pharmaceutical Industries, Technological Advancements, Innovations, Drug Discovery.

BRNS/RCP/25/P-31

A Review on Molecular Optimization in Artificial Intelligence Based Drug Discovery

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Abstract:

Drug discovery is aimed to design novel molecules with specific chemical properties for the treatment of targeting diseases. Generally, molecular optimization is one important step in drug discovery, which optimizes the physical and chemical properties of a molecule. Currently, artificial intelligence techniques have shown excellent success in drug discovery, which has emerged as a new strategy to address the challenges of drug design including molecular optimization, and drastically reduce the costs and time for drug discovery. We review the latest advances of molecular optimization in artificial intelligence-based drug discovery, including data resources, molecular properties, optimization methodologies, and assessment criteria for molecular optimization. Specifically, we classify the optimization methodologies into molecular mapping-based, molecular distribution matching based, and guided search-based methods, respectively, and discuss the principles of these methods as well as their pros and cons. Moreover, we highlight the current challenges in molecular optimization and offer a variety of perspectives, including interpretability, multidimensional optimization, and mode generalization, on potential new lines of research to pursue in future. This study provides comprehensive review of molecular optimization in artificial intelligence-based drug discovery, which points out the challenges as well as the new prospects. This review will guide researchers who are interested inartificial intelligence molecular optimization.

Keywords: Artificial Intelligence, Drug Discovery, Molecular Optimization

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General Nuclear Medicine

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Abstract

GFR is the quantity of glomerular filtrate formed by all the nephrons of both kidney per unit time, which cannot be measured directly. There are various techniques to measure GFR, of them the 24-hour creatinine clearance (CCr) is the standard clinical technique for measuring kidney function: however, this method is quite cumbersome and inconvenient. We hypothesized that a camera – based GFR masurement with 99mTc diethylene triamine-penta-acetic acid(99mTc-DTPA) would compare and correlate well with the 24hour creatinine clearance and could serve as a simple marker of kidney.

Keywords: GFR(glomerular filtration rate), nephrons, kidney per unit time, kidney clearace rate (CCr), diethylene triamine-penta-acetic acid.

BRNS/RCP/25/P-33

Recent Advances in Cancer Drug Discovery Through the Use of Phenotypic Reporter Systems, Connectivity Mapping, and Pooled CRISPR Screening

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Abstract

Multi-omic approaches offer an unprecedented overview of the development, plasticity, and resistance of cancer. However, the translation from anti-cancer compounds identified *in vitro* to clinically active drugs have a notoriously low success rate. Here, we review how technical advances in cell culture, robotics, computational biology, and development of reporter systems have transformed drug discovery, enabling screening approaches tailored to clinically relevant functional readouts (e.g., bypassing drug resistance). Illustrating with selected examples of "success stories," we describe the process of phenotype-based high-throughput drug screening to target malignant cells or the immune system. Second, we describe computational approaches that link transcriptomic profiling of cancers with existing pharmaceutical compounds to accelerate drug repurposing. Finally, we review how CRISPR-based screening can be applied for the discovery of mechanisms of drug resistance and sensitization. Overall, we explore how the complementary strengths of each of these approaches allow them to transform the paradigm of pre-clinical drug development.

Keywords: CRISPR, Anticancer, Drug discovery.

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A Review on: Molecular Optimization in Artificial Intelligence - Based Cancer

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Abstract

Cancer is the multifactorial, heterogeneous and chronic disease. Basically, cancer itself is a group of disease, because of its frequency reciprocal influences ever minor influence may lead to major impact. Epidemiological studies clearly indicate that risk for several type of cancer including pancreas cancer ,liver cancer ,breast cancer ,urinary tract cancer is to high for mortality and morbidity .Obesity ,hyperglycemia and increased oxidative stress may also contribute to increase cancer risk .Despite many decades of basic research and clinical research and trials of promising new therapies ,new drug , new treatment ,cancer is the main cause of morbidity and mortality in conclusion cancer is a complex disease which is gaining more of its popularity in human and so ,it need more clinical attention and better designed treatments ,studies and drugs. Molecular optimization plays a pivotal role in accelerating the discovery of effective and selective anticancer agents. Recent advancements in artificial intelligence (AI), particularly machine learning, deep learning, and generative models, have transformed the way molecular structures are designed, evaluated, and refined. This review highlights the integration of AI-driven approaches in cancer-focused drug optimization, covering key techniques such as reinforcement learning, graph neural networks, transformer-based models, and multi-objective optimization frameworks. Future directions emphasize hybrid human-AI collaboration, explainable modeling, and integration of multi-omics data to enable faster, more accurate and cost-effective anticancer drug discovery. Overall, AI-driven molecular optimization represents a transformative approach poised to reshape the landscape of cancer therapeutics.

Keyword: Molecular optimization, Artificial intelligence, Drug discovery, Cancer therapeutics

BRNS/RCP/25/P-35

AI-Driven Molecular Docking Approaches in Radiopharmaceutical and Antiglycation Drug Design: Challenges and Future Prospects

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Abstract

Artificial intelligence (AI) and molecular docking have emerged as powerful tools for accelerating modern drug discovery, especially in radiopharmaceutical development and antiglycation therapy. AI-driven techniques facilitate rapid virtual screening, binding affinity prediction, structural refinement, and early identification of promising lead candidates. In radiopharmaceutical research, these computational strategies assist in ligand-receptor modeling, radioisotope-chelator selection, and forecasting biodistribution behavior. However, despite these advancements, several scientific and technical challenges restrict the full integration of AI-assisted docking approaches. Radiopharmaceuticals often involve complex radiometal coordination, limited structural databases, and isotope-decay-induced instability, which compromise docking precision and impede the training of reliable AI models. Addressing these barriers will require integrating AI with molecular dynamics simulations, quantum chemical methods, and experimental validation. In conclusion, overcoming these challenges will significantly strengthen the predictive capabilities of AI-driven docking and enable the efficient discovery of safer, more effective radiopharmaceutical and antiglycation therapeutic agents.

Keywords: Artificial Intelligence, Molecular Docking Simulations, Radiopharmaceutical, Antiglycation, Computational Chemistry.

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Ethics of AI: Challenges and Governance of Artificial Intelligence in Radio Pharmaceutical Research

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Abstract

AI Integration and Benefits AI and Machine Learning (ML) are actively transforming clinical pharmacy through Clinical Decision Support Systems (CDSS), optimizing medication management, personalizing dosing (e.g., in pharmacogenomics), and verifying prescription accuracy. In pharmacovigilance, AI significantly improves the speed and precision of Adverse Drug Event (ADE) detection, safety signal identification, and case processing from vast, unstructured data sourcesKey Ethical Challenges The primary ethical concerns mirror those in radiopharmaceutical research, centering on data privacy, algorithmic bias, and transparencyData Privacy & Security:- AI models require access to large volumes of sensitive patient data, raising significant risks of data breaches and the re-identification of anonymized information. Compliance with regulations like GDPR is paramount Bias & Fairness:- AI models trained on unrepresentative datasets can perpetuate and exacerbate health inequities, leading to biased treatment recommendations or skewed safety assessments for certain patient groups. Governance and the Human Role:- Effective governance is essential to ensure AI is used ethically. This includes demanding Explainable AI (XAI) frameworks and maintaining that human healthcare professionals retain final authority and accountability for all clinical and safety decisions, preventing an over-reliance on technology and the deskilling of the workforce.

Keyword: Pharmacovigilance, Ethical Challenges, Data Privacy, Algorithmic Bias Transparent

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Ethics of AI : Challenges and Governance of Artificial Intelligence in Radio Pharmaceutical Research

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Abstract

This abstract extrapolates the ethical and governance challenges of Artificial Intelligence (AI) from the domain of radiopharmaceutical research to Clinical Pharmacy and Pharmacovigilance. AI holds immense promise in these areas, particularly in optimizing drug therapy, predicting adverse drug reactions (ADRs), and automating surveillance processes. However, its adoption introduces significant ethical and medico-legal complexities that mirror those in medical imaging. Key Challenges and Governance PrinciplesAlgorithmic Bias AI models trained on non-representative patient data could perpetuate or amplify biases, leading to inequitable drug therapy recommendations or biased ADR signal detection for certain populations in clinical pharmacy and pharmacovigilance, respectively. Fairness and Justice are paramount. The "black box" nature of deep learning models hinders a pharmacist's ability to understand why an AI recommended a specific dosage or flagged a potential safety signal. Lack of T&E compromises clinical trust, human oversight, and effective intervention in high-stakes decisionsData Privacy and SecurityAI systems rely on vast amounts of sensitive patient health information (PHI) for model training and deployment. Ensuring robust data protection and patient autonomy over data use is critical throughout the AI lifecycle, especially for pharmacovigilance data aggregation. Responsibility and accountability: Clarifying who is liable when an AI-driven system in clinical practice leads to patient harm—the developer, the clinician, or the AI itself—remains a major governance challenge. Ultimate human responsibility must be maintained.

Keywords: Artificial Intelligence (AI), Clinical Pharmacy, Pharmacovigilance, Ethics, Governance

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Rare diseases and Biotechnology Instrumentation in Biotechnology

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Abstract

Rare diseases, though individually uncommon, collectively affect over 300 million people worldwide and present significant challenges in diagnosis, treatment, and healthcare access. Most are genetic in origin and begin in childhood, yet many patients face an average diagnostic delay of 5–7 years and limited therapeutic options. Recent advances in biotechnology—such as gene therapy, CRISPR gene editing, mRNA-based therapeutics, monoclonal antibodies, and enzyme replacement therapies- are transforming the landscape by offering targeted and potentially curative treatments. Molecular diagnostic tools like PCR, gene sequencing, and FISH are improving early detection, while cross-sector partnerships between public agencies, biotech companies, and advocacy groups are accelerating research and standardizing care models. Despite remaining barriers in affordability and access, these innovations mark a pivotal shift toward personalized, effective, and collaborative approaches to managing rare diseases. This paper also addresses the key ethical and accessibility challenges in rare disease treatment and explores how Artificial Intelligence is transforming diagnosis, therapy development, and access through innovative data driven approaches.

Keywords: Diagnostics, orphan disease, genetic disease, and therapeutics.

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Exploring the Spectrum: A Detailed Review of Blood Cancer Types and Their Clinical Implications

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Abstract

Blood cancers occur because of changes in the structure and function of your blood cells. Most of these cancers start in the bone marrow, where the blood cells originate. When stem cells mature in the bone marrow, they become three types of blood cells: red blood cells, white blood cells, or platelets. In most blood cancers, the normal growth of blood cells is interrupted by the uncontrolled growth of a different type of blood. These abnormal blood cells, or cancer cells, prevent blood cells from doing many things, such as fighting infections or preventing excessive bleeding. There are three main groups of blood cancers: leukemia, lymphoma (Hodgkin's lymphoma, non-Hodgkin's lymphoma), myeloma and Myelodysplastic syndromes (MDS). The treatment of leukemia depends on the type of cancer, age, how fast the cancer is progressing, where the cancer has spread and other factors and some of the common treatments for leukemia are chemotherapy, radiation therapy, and sometimes, stem cells and bone marrow exchange.

Keywords: Myelodysplastic syndromes, Leukemia, Lymphomas, Myeloma.

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Role of AI in Breast Cancer Therapy

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Abstract

Breast cancer is a common disease, and giving the right treatment at the right time is very important. Artificial Intelligence (AI) helps doctors by studying scans, reports, and patient information quickly and accurately. AI can detect breast cancer early by noticing very small changes in mammograms or other scans. During treatment, AI tools help doctors track howwell the patient is responding to medicines like chemotherapy, hormone therapy, or targeted therapy. It also helps decide the best treatment for each patient by understanding the type of tumor and how it might respond to different medicines. During treatment, AI can check how well the therapy is working and warn doctors if there are any side effects or signs that the cancer might return. In research, AI is used to study thousands of medicines quickly to find new drugs and new treatment methods for breast cancer. AI also supports robotic surgery, improves radiation planning, and reduces human error. Overall, AI makes breast cancer therapy faster, safer, and more accurate, improving patient outcome.

Keywords: Artificial Intelligence, Breast Cancer, Early Detection, Diagnosis, Personalized Therapy, Treatment Monitoring, Drug Discovery.

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Role of Nuclear Medicine in Modern Pharmacy Practice: Applications, Safety and Therapeutic Advancements

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Abstract

Nuclear medicine is an important and rapidly growing branch of healthcare that uses radiopharmaceuticals for the diagnosis and treatment of various diseases. In the field of pharmacy, the role of nuclear medicine is becoming increasingly significant because pharmacists are directly involved in the preparation, handling, quality control, and safe dispensing of radioactive drugs. Radiopharmaceuticals help doctors understand the functional activity of organs, which is not possible with routine imaging techniques like X-ray or CT. Procedures such as PET-CT and SPECT-CT allow early detection of cancer, heart diseases, thyroid disorders, bone infections, and kidney problems. Pharmacists working in nuclear medicine are responsible for selecting appropriate radiotracers, maintaining aseptic preparation conditions, ensuring correct dosage, and monitoring radiation safety protocols. They also guide patients about pre-scan precautions and post-procedure safety measures. In therapeutic applications, radioactive isotopes like Iodine-131 and Lutetium-177 are used for treating thyroid disorders and certain cancers. Pharmacists ensure proper storage, labeling, and safe administration to minimize radiation exposure. With advancements in technology, the demand for trained nuclear pharmacists is increasing. Nuclear medicine, therefore, represents an important interface between pharmaceutical science and modern diagnostic imaging, making it a vital area of practice for future pharmacists.

Keywords: Nuclear, Medicine, Radiopharmaceuticals, PETCT,SPECT, Radioactive drugs, Pharmacy role, Radiation safety

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A Review on : Role of Nanobiotechnology in Pharmacy and Medicine

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Abstract:

Nanobiotechnology is a term, which describes the combination of the two different worlds of engineering and molecular biology. It is a fusion of the Following words: "nano" meaning very small, "bio" meaning living, and "technology" meaning use of tools. Tools and devices designed in Nanobiotechnology applications are dependent directly on the current nanotechnology principles. In this review, the applications of Nano biotechnology in various areas such as drug delivery, gene therapy, tissue engineering, molecular diagnostics and food safety are summarized. The Multidisciplinary area of Nanobiotechnology has a powerful impact in various disciplines of scientific fields. It provides opportunities to develop new Materials and techniques that improve the ability for developing quick, sensitive and reliable analytical techniques.

Keywords: Nanobiotechnology, Nanoparticles, Nanobiology, Nanomedicine, Drug Delivery and Biotechnology

BRNS/RCP/25/P-43

Artificial intelligence-driven radiopharmaceutical design for targeted cancer therapy: a transformative approach in nuclear medicine

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Abstract

Cancer continues to be one of the leading causes of mortality globally, demanding innovative therapeutic strategies that maximize efficacy while minimizing toxicity. Radiopharmaceuticals, a key component of nuclear medicine, offer highly targeted delivery of therapeutic radioisotopes directly to cancer cells, sparing surrounding healthy tissues. However, the rational design and clinical translation of radiopharmaceutical agents remains challenging due to complex biological interactions, long development timelines, and limited predictive accuracy of conventional research models. Machine learning models and deep neural networks enable high-precision prediction of ligand–receptor binding affinity, optimization of radionuclide selection, and simulation of bio distribution and dosimetry. Integrating AI into radiopharmaceutical research significantly reduces experimental cost and time, increases safety profiling, improves individualized treatment planning, and supports precision oncology. Clinical applications such as automated tumor segmentation, treatment response monitoring, and AI-guided radionuclide therapy planning already demonstrate promising outcomes, particularly in prostate cancer (PSMA-based agents), neuroendocrine tumors, and metastatic malignancies. The convergence of computational intelligence and molecular imaging opens a pathway toward personalized, more effective and safer cancer treatment.

Keywords: Artificial Intelligence, Radiopharmaceuticals, Nuclear Medicine, Targeted Cancer Therapy, PET/SPECT

BRNS/RCP/25/P-44

Application of Pharmaceutical biotechnology

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Abstract

Pharmaceutical biotechnology is a field of research which utilizes living organisms or their byproducts to create and generate novel medications and cures by combining the concepts of biotechnology with pharmaceuticals. It focuses on developing novel medications, enhancing current ones, and creating more effective drug delivery systems. Pharmaceutical biotechnology utilizes biological systems and processes to design, develop, and produce new drugs, including proteins, antibodies, and nucleic acid-based therapies. It also involves the use of living organisms to manufacture large quantities of these drugs, often in a more efficient and cost-effective way compared to traditional chemical synthesis. Pharmaceutical biotechnology plays a role in developing personalized medicines tailored to an individual's genetic makeup, potentially leading to more effective and targeted treatments. Antibody Production: Biotechnological methods are utilized to create monoclonal antibodies, which are used in cancer treatment and other medicines. Vaccine Development: Biotechnology is essential to the creation and production of vaccines, particularly those for bacterial and viral illnesses.Gene therapy is the process of introducing therapeutic genes into patients' cells using viruses, possibly fixing genetic flaws. In essence, pharmaceutical biotechnology is a dynamic field that is revolutionizing drug development and manufacturing, offering new hope for treating a wide range of diseases and improving human health.

Keywords: drug delivery, antibody, biotechnology, vaccine, monoclonal antibodies

BRNS/RCP/25/P-45

Liver Cancer: Therapeutic Challenges and the Importance of Experimental Models

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Abstract

Liver cancer is one of the main causes of death related to cancer worldwide; its etiology is related with infections by C or B hepatitis virus, alcohol consumption, smoking, obesity, nonalcoholic fatty liver disease, diabetes, and iron overload, among other causes. Several kinds of primary liver cancer occur, but we will focus on hepatocellular carcinoma (HCC). Numerous cellular signaling pathways are implicated in hepatocarcinogenesis, including YAP-HIPPO, Wnt-β-catenin, and nuclear factor-κB (NF-κB); these in turn are considered novel therapeutic targets. In this review, the role of lipid metabolism regulated by peroxisome proliferator-activated receptor gamma (PPARγ) in the development of HCC will also be discussed. Moreover, recent evidence has been obtained regarding the participation of epigenetic changes such as acetylation and methylation of histones and DNA methylation in the development of HCC. In this review, we provide detailed and current information about these topics. Experimental models represent useful tools for studying the different stages of liver cancer and help to develop new pharmacologic treatments. Each model in vivo and in vitro has several characteristics and advantages to offer for the study of this disease. Finally, the main therapies approved for the treatment of HCC patients, first- and second-line therapies, are described in this review. We also describe a novel option, pirfenidone, which due to its pharmacological properties could be considered in the future as a therapeutic option for HCC treatment

Keywords: Hepatocellular, peroxisome proliferator, methylation, pirfenidone, Liver cancer, Signaling pathways, Epigenetics.

BRNS/RCP/25/P-46

Development and Characterization of Temisartan-loaded Transdermal Drug Delivery System for the Management of Hypertension

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Abstract

Telmisartan, an angiotensin II receptor blocker (ARB), is widely used in the management of hypertension and cardiovascular disorders. However, its low oral bioavailability (approximately 40–60%) due to extensive first-pass metabolism and poor aqueous solubility limits its therapeutic efficiency. To overcome these challenges, the development of a Transdermal Drug Delivery System (TDDS) offers a promising alternative route for controlled and sustained drug delivery. In this study, telmisartan-loaded transdermal patches were formulated using various polymers such as hydroxypropyl methylcellulose (HPMC), polyvinyl alcohol (PVA), and ethyl cellulose through the solvent casting technique. The prepared films were evaluated for physicochemical parameters including thickness, weight uniformity, drug content, tensile strength, moisture absorption, and folding endurance. In vitro drug release studies demonstrated a sustained release profile over 24 hours, with formulations containing a balanced polymer ratio showing optimal permeability and drug diffusion across the skin. Fourier-transform infrared spectroscopy (FTIR) confirmed the absence of drug–polymer interactions, ensuring chemical stability. The optimized formulation exhibited desirable mechanical strength, uniform drug distribution, and enhanced permeation flux, suggesting improved bioavailability compared to conventional oral dosage forms.

Keywords: Telmisartan, Transdermal Drug Delivery System, Hypertension, Solvent Casting, Sustained Release, Bioavailability.

BRNS/RCP/25/P-47

Drug Discovery in Artificial Intelligence

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Abstract

Drug discovery is a long and complex process that involves identifying new medicines to treat diseases. Traditionally, it requires many years of research, high cost, and extensive laboratory testing to find safe and effective drug candidates. As diseases become more complicated, the need for faster and smarter methods in drug development has increase Artificial Intelligence (AI) is a modern technology that allows computers to learn from data and make predictions or decisions. In the pharmaceutical field, AI is helping scientists analyze large amounts of biological and chemical information quickly. This makes the overall drug discovery process more efficient and accurate. The role of AI in drug discovery includes identifying potential drug targets, screening thousands of molecules in a short time, predicting drug target interaction, and designing new drug candidates. AI tools can also help in predicting safety, toxicity, and side effects of drugs before testing them in lab. This reduces cost, save time, and increases the chances of success. Al offers man advantages, such as faster drug development, lower research cost, improved accuracy, and ability to repurpose existing drug for new diseases. However, there are also disadvantages. Al models depend on high-quality data, and poor data can lead to incorrect results. Some AI system is difficult to interpret, and there are concerns about data privacy and technical limitations. AI is become an important part of modern drug discovery and has the potential to transform the future of medicine.

Keywords: Drug Discovery, Artificial Intelligence, Virtual Screening, Drug Design

BRNS/RCP/25/P-48

Role of clinical pharmacist in pharmacovigilance

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Abstract

Pharmacovigilance aims to ensure the safe and effective use of medicines by detecting, assessing, monitoring, and preventing adverse drug reactions (ADRs). Clinical pharmacists play a crucial role in strengthening pharmacovigilance activities within healthcare settings. Their direct involvement in patient care enables early identification of drug-related problems, medication errors, and potential ADRs. Clinical pharmacists participate in ADR detection, documentation, causality assessment, and timely reporting to Pharmacovigilance Programme of India (PvPI). They provide drug information, conduct medication reviews, and support rational use of medicines. Through patient counseling and therapeutic monitoring, they help minimize drug risks and improve treatment outcomes. By collaborating with physicians and nurses, clinical pharmacists enhance post-marketing surveillance and contribute to safer medication practices. Therefore, the integration of clinical pharmacy services with pharmacovigilance systems is essential to improve patient safety and overall healthcare quality.

Keywords: Clinical pharmacist, pharmacovigilance, adverse drug reactions, medication errors, drug safety

BRNS/RCP/25/P-49

Synthesis of Alendronate Functionalized Gelatin Biomaterial to Prepare Nanoparticles for Bone Specific Targeting

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Abstract

The present investigation was undertaken to develop Nanoparticles for bone specific targeting and to improve the entrapment efficiency of the drug in Nanoparticles. These features are utilized to deliver high drug load to impaired bone tissues using tissue specific targeting. Alendronate is used for bone targeting because it has strong affinity for hydroxyapatite, the primary mineral component of bone. It works by inhibiting Osteoclast activity to prevent bone resorption. In this study, Alendronate was grafted onto gelatin type-B using an EDC coupling mechanism between the carboxyl group of gelatin and amino group of Alendronate. The modified gelatin derivative was then characterized by FTIR spectrometry and powder X-ray diffraction. FTIR spectra of Alendronate shows a very well structured absorption peak at 3487 cm^{-1} due to hydroxyl free groups, while NH_2 absorption peak appear at 3245 cm^{-1} respectively. Absorption peak at 1020 and 1050 cm^{-1} are due to P=O stretching vibration. A peak at 2950 appears due to C-H stretching. The spectra of gelatin shows four main characteristics amide bands at 3300 cm^{-1}, 1644 cm^{-1}, 1534 cm^{-1} and 1233 cm^{-1}. After modification additional features are observed within the IR spectra. Specifically at 950 cm-1 due to P=O stretching, 1644 cm^{-1} due to C=O stretching vibration of the amide chains Shows successful Alendronate grafting on gelatin. Whereas, Powder X-ray diffraction reveals that, after modification gelatin shows a higher degree of crystallinity this provide additional confirmation of successful grafting.

Keywords: Nanoparticles, Alendronate, Biomaterials, Spectrometry, Targeting

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Pharmacovigilance and Studies of Clinical Research for Health Care

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Abstract

The research and practices involved in discovering, recognizing, evaluating, verifying and preventing harmful effect of pharmaceutical drugs are known as Pharmacovigilance. Pharmacovigilance plays a critical role in ensuring the safety, efficacy, and overall quality of medical products throughout their life cycle. Clinical research studies ranging from pre-clinical testing to post marketing surveillance provide structured methodologies for evaluating drug safety and effectiveness in diverse population. Innovative technologies like artificial intelligence are transforming Pharmacovigilance (PV) by automating signal detection and predictive modeling aiding regulatory decision making. This study explains how both areas work together to improve drug safety, protect patients and support better healthcare.

Keywords: Pharmacovigilance, clinical research, drug safety, adverse effects, patient safety, healthcare.

BRNS/RCP/25/P-51

Evaluation of Antinephrolithiatic Activity of Ethanolic Extract of *chenopodium album linn*(leaves) in Rats against Calcium Oxalate-induced Lithiasis

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Abstract

Nephrolithiasis, predominantly caused by calcium oxalate (CaOx) crystal deposition, is a prevalent urinary disorder with significant recurrence rates. The search for effective and safe herbal therapies has increased due to the limitations and side effects associated with current pharmacological treatments. *Chenopodium album Linn.,* traditionally used for renal disorders, contains bioactive constituents such as flavonoids, saponins, alkaloids, and phenolics that may offer protective effects against stone formation. The present study evaluates the antinephrolithiatic activity of the ethanolic extract of Chenopodium album leaves (EECA) in rats with experimentally induced calcium oxalate lithiasis. Nephrolithiasis was induced by oral administration of ethylene glycol–ammonium chloride, followed by treatment with EECA at selected doses. The standard drug Cystone was used for comparison. Biochemical parameters such as urine volume, urinary calcium, oxalate, phosphate, serum creatinine, urea, and uric acid were measured, along with kidney homogenate analysis for CaOx deposition. Histopathological examination of renal tissue was conducted to confirm structural restoration.

Keywords: Antinephrolithiatic activity, kidney stone, renal calculi, Flavonoids, Alkaloids.

BRNS/RCP/25/P-52

Preparation and Characterization of Aprimilast loaded Transferosome for Transdermal Delivery System

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Abstract

Transfersomes are highly optimized ultra-deformable lipid aggregates, exceptionally flexible, and capable of penetration through mammalian skin intact. They are effective carrier systems for delivering both low and high-molecular-weight drugs Transdermally. The present investigation was to formulate transferosomal gel which is an approach for the delivery of an Antipsoriatic drug, Apremilast. Apremilast, a new PDE4 inhibitor with additional TNF-αinhibitory properties, is presently undergoing clinical trials for potential use in treating psoriasis and various inflammatory disorders. Apremilast transfersomalgel was formulated and optimized by using a rotary evaporator. Initially, 9 (F1, F2, F3, F4, F5, F6, F7, F8, F9) transferosomal formulations were prepared by using the approach of quality by design (QbD). A 2 level 2 factor, full factorial composite design was applied to formulate Apremilast transferosomes. Independent variables selected are Concentration (conc.) of Soya Lecithin and Tween 80. All were set at low level and high level. Responses were chosen as Particle size (PS), Polydispersity index (PDI) Zeta potential (ZP). QbD is a systematic method that can be utilized in formulation development. Out of 9 formulations, the optimized formulation F2 was selected because of its efficient entrapment efficiency, vesicle size, and zeta potential. The optimized formulation F2 was made into a transferosomal gel by usingcarbopol 934 as a gelling agent and in-vitro permeation studies were performed for about 12 hours by using a Franz diffusion cell apparatus, drug release at the end of the 6thhourwas 79.5.

Keywords: Transferosomes; Apremilast; Psoriasis; Transferosomal Gel; Quality by design (QbD).

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Formulation and Evaluation of teicoplanin loaded Solid Lipid Nanoparticle (SLN) for the Treatment of Bacterial Infection

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Abstract

The study addresses the increasing issue of drug-resistant bacterial infections and the need for advanced drug-delivery systems, particularly for enhancing the efficacy of established antibiotics such as teicoplanin, which faces challenges like low bioavailability and inconsistent pharmacokinetics. The research focuses on developing teicoplanin-loaded solid lipid nanoparticles (SLNs) using w/o/w double emulsion solvent evaporation method. SLNs are highlighted for their biocompatibility, controlled-release properties, and ability to stabilize drugs. Stearic acid was dissolved in 5ml solvent mixture consisting of DCM: MeOH (2:3). 20 miligram of teicoplanin was disolved in 1ml aqueous solution containing 0.125% v/v Tween 80. Both the solutions were mixed and sonicated using ultrasonication for 2 min at 6° C and 0.5 frequency. The primary emulsion obtained was than poured into 100ml PVA solution at room tempreature(25°C) and stirred for 2Hr at 1500 rpm. Finally, the suspension was filtered and used as such for further analysis. The characterization of the developed SLNs included assessments of particle size, polydispersity index (PDI), zeta potential, drug-loading capacity, entrapment efficiency, and morphological characteristics through dynamic light scattering and electron microscopy. Transmission electron microscopy images confirmed the formation of spherical SLNs. The size increased (from 130 nm to 200 nm) and the negative value of zeta potential (- 21.29) changed to positive (+22.41). The in-vitro release data showed prolonged release of teicoplanin from optimized SLN.

Keywords: Teicoplanin; Solid Lipid Nanoparticles; w/o/w double emulsion solvent evaporation method; Nanocarrier; Antibacterial Activity

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Formulation and Evaluation of Xanthan Gum based Emulgel for Treatment of Onchomycosis

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Abstract

Onychomycosis is a fungal infection of the nails that is difficult to treat with conventional topical or oral therapies. This study focuses on the formulation and evaluation of a xanthan gum-based emulgel containing Fluconazole for effective topical treatment of onychomycosis. Xanthan gum was used as a natural gelling agent to improve viscosity, spreadability, and drug release. The Fluconazole emulgel was prepared by incorporating the oil phase containing the drug and emulsifiers into an aqueous phase, followed by gelation using xanthan gum and addition of penetration enhancers such as propylene glycol and urea. The formulation was evaluated for pH, viscosity, spreadability, drug content, stability, in-vitro drug release, and antifungal activity. The optimized Fluconazole emulgel showed good physical stability, controlled drug release, and improved nail permeation compared to a plain gel. Xanthan gum-based Fluconazole emulgel is a promising and effective topical formulation for the treatment of onychomycosis, offering better drug delivery and patient compliance.

Keywords: Fluconazole, Xanthan gum, Emulgel, Onychomycosis, Antifungal, Topical delivery.

BRNS/RCP/25/P-55

Fluconazole loaded Emulgel Nanocarrier Approachs For targeted Antifungal Therapy

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Abstract

Nanomedicine provides advanced approaches for specific and prolonged drug delivery, especially for antifungal agents with low solubility like fluconazole. Emulgels, merging the benefits of emulsions and gels, enhance spreadability, stability, and deeper penetration into the skin, positioning them as a viable nanocarrier system for topical treatments. In this research, an emulgel infused with fluconazole was created by developing a gel base with Carbopol and HPMC, then integrating an oil-in-water emulsion made at 70–75°C, subsequently adjusting the pH with triethanolamine to achieve a uniform and stable emulgel. The formulation was assessed for physicochemical characteristics such as appearance, viscosity, spreadability, pH, and drug content, in addition to in vitro drug release and droplet size distribution. Enhanced batches exhibited a smooth texture, appropriate skin-friendly pH (5.8–6.4), good spreadability, nano-sized droplets, and prolonged drug release, leading to better antifungal effectiveness and improved site-specific delivery. In summary, the formulated fluconazole emulgel functions as an intelligent nanocarrier, providing targeted, extended, and efficient antifungal treatment with minimized side effects and improved patient adherence.

Keywords: Fluconazole, Emulgel, Nanocarrier, Nanomedicine, Cutaneous Drug Administration, Antifungal Treatment

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Development and Characterization of Azelaic Acid Gel Formulation Enriched with Aloevera Extracts for Pigmentation

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Abstract

The present work focuses on the formulation and evaluation of a herbal cosmetic gel containing Aloe vera extract, flaxseed mucilage, and the therapeutic agent azelaic acid. Aloe vera provides moisturizing, wound-healing, anti-inflammatory and antioxidant benefits, while flaxseed offers omega-3 fatty acids, lignans, and natural polysaccharides that enhance hydration, skin repair, and barrier protection. Azelaic acid contributes depigmenting, anti-acne, keratolytic and anti-inflammatory actions, making the formulation suitable for anti-tanning and skin-brightening applications.Herbal extracts were prepared by aqueous extraction, followed by gel formulation using Carbomer 934 as the optimized gelling agent (3%). The gel was evaluated for pH, spreadability, viscosity, extrudability, and homogeneity. The optimized batch exhibited smooth texture, acceptable pH (6.3–6.6), good spreadability, uniform consistency, and stability without phase separation.The formulated gel provides multiple cosmetic and therapeutic benefits, including reduction of tanning, improvement in skin hydration, faster healing of minor wounds or sun damage, and antioxidant protection. The combination of natural ingredients with azelaic acid enhances efficacy while maintaining safety. Thus, the developed herbal cosmetic gel is a promising, easy-to-prepare, and effective topical formulation for skincare and anti-tanning purposes.

Keywords: Aloevera extract, Flaxseed mucilage, Azelaic acid, Herbal cosmetic gel, Anti-tanning

BRNS/RCP/25/P-57

Investigation of Pharmacological Activity of *Barleria Grandiflora* as Analgesic Compound

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Abstract

The investigation of safer plant-based substitutes is prompted by the fact that pain is a complicated physiological reaction that is frequently treated with synthetic analgesics that may have negative side effects after extended use. Phytoconstituents like flavonoids, iridoids, phenolic compounds, and terpenoids found in the traditionally used medicinal herb *Barleria grandiflora* may have analgesic effects. Using well-established in-vivo pain models, the current study attempts to explore the pharmacological analgesic potential of the ethanolic extract of *Barleria grandiflora* leaves. Soxhlet extraction was used to prepare the extracts, which were then assessed using standard medications as reference controls in animal models like the hot-plate method writhing test.When compared to the control group, the extract significantly decreased writhing responses and increased pain-threshold latency, suggesting both peripheral and central analgesic effects. The bioactive components responsible for the observed activity were found through phytochemical screening. Overall, the results point to *Barleria grandiflora's* potential analgesic qualities, confirming its traditional use and offering a solid scientific foundation for its continued advancement as a natural painkiller.

Keywords: *Barleria grandiflora,* Analgesic, Hot plate method, wistar rats, Soxhlet extraction, Phytoconstituents.

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Hypoglycemic Effect of Ethanolic Extract of *Annona Squmosa* (seeds) on Steptozotocin induced in Rat

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Abstract

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from impaired insulin secretion, action, or both. Natural plant-based therapies are increasingly explored for safer and more effective management of diabetes. Annona squamosa L. (custard apple) seeds have been reported to possess bioactive phytoconstituents with potential antihyperglycemic properties. The present study aimed to evaluate the hypoglycemic effect of the ethanolic extract of Annona squamosa seeds in streptozotocin (STZ)-induced diabetic rats. Diabetes was induced in Wistar rats using STZ, and animals were divided into experimental groups receiving vehicle control, standard drug (glibenclamide), and varying doses of the ethanolic seed extract. The extract-treated groups showed a significant reduction in fasting blood glucose compared to the diabetic control, along with improvement in body weight and general metabolic condition. The observed antihyperglycemic activity may be attributed to the presence of flavonoids, alkaloids, and tannins, which could enhance insulin secretion or improve peripheral glucose utilization. These findings suggest that the ethanolic extract of Annona squamosa seeds exhibits promising hypoglycemic potential and may serve as a natural therapeutic candidate for diabetes management. Further studies on isolation of active compounds and mechanism of action are warranted.

Keywords: Annona squmosa, ethanolic extract, stz-induced diabetes, glibenclamide, wistar rats, antidiabetic.

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Formulation and Evaluation of Polymyxin-B Loaded gelatin Nanoparticle for the Treatment of Bacterial infection

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Abstract

Polymyxin-B–loaded gelatin nanoparticles were successfully prepared using a water-in-oil (W/O) nanoemulsion technique to enhance the stability and controlled release of the antibiotic. In this method, an aqueous phase containing gelatin and polymyxin-B was dispersed into a continuous oil phase with suitable surfactants to form a stable nanoemulsion. The resulting nanoparticles exhibited spherical morphology, narrow size distribution, and high encapsulation efficiency, indicating the suitability of the W/O nanoemulsion system for producing uniform gelatin-based carriers. This approach demonstrates a promising strategy for developing biodegradable nanocarriers for antimicrobial delivery, potentially enhancing therapeutic performance while minimizing systemic toxicity. Polymyxin B-loaded gelatin nanoparticles (186.9 nm) and Nanoemulsion systems (125 nm) were formulated to achieve prolonged drug release for improved treatment of gram-negative infections. Both systems were evaluated for antimicrobial activity against E. COLI using turbidimetric growth monitoring. The prepared solution of Gelatin nanoparticles presented an average size of approximately 19.24 nm and with a particle size distribution (PDI) of 0.077. Also, the zeta potential of the nanoparticles was measured at −21.8 mV revealing a relatively high zeta potential results in stronger electrostatic repulsion which prevents particle aggregation and leads to better size stability. Also, the two-dimensional morphological information of gelatin containing gelatin-O is shown in. In these pictures, TEM micrographs confirmed a uniform round shape with smooth surface particles for gelatin nanoparticle.

Keywords: Polymyxin – B, Gelatin Nanoparticles, Desolvation Method, Antibacterial Activity.

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Skin cancer awareness: recognizing OMA, Squamous cell carcinoma, and Melanoma for early cure

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Abstract

Skin cancer is the most common malignancy globally, and its incidence continues to rise, presenting a significant public health challenge. The primary types include melanoma (the most aggressive form) and non-melanoma skin cancers, such as basal cell carcinoma (BCC) and squamous cell carcinoma (SCC). The main etiological factor is exposure to ultraviolet (UV) radiation from the sun or tanning beds, which causes DNA damage and genetic mutations in skin cells. Early detection is paramount for a favorable prognosis and improved survival rates, as most forms are highly curable in their initial stages. Diagnosis typically involves visual inspection, often guided by the ABCDE rule for melanoma, followed by a biopsy for definitive histopathologic evaluation. Ongoing research focuses on improving prevention strategies and developing advanced diagnostic aids, including artificial intelligence and deep learning methods, to assist in early and accurate identification.

Keywords : Skin cancer, Melanoma, Non-melanoma skin cancer, Basal cell carcinoma (BCC), Squamous cell carcinoma (SCC),

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Drug Discovery

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Abstract:

The process of drug development is very expensive process due to high costs of R&D and human clinical tests. At present a new approach is being tried to understand how disease and infection are controlled at the molecular and physiological level and to target specific entities based on the knowledge. The drugs discoveries are based on molecular biological targets and improve the therapy for disease; wide ranging dosages of the compounds are introduced to the cell line or animal in order to obtain preliminary efficacy and pharmacokinetic information. The process of drug discovery involves the identification of candidates, synthesis, characterization, screening & assay for therapeutic efficacy. Once a compound has shown its value in these tests, it will begin the process of drug development prior to clinical trials.

Keywords: Drug discovery: introduction, history of drug discovery, drug discoveries overview, steps in modern drug discovery, advantages and disadvantages of drugs discovery, conclusion.

BRNS/RCP/25/P-62

An Overview of Cancer

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Abstract:

Cancer is defined as one of the large groups of diseases characterized by the development of abnormal cells that grow beyond their boundaries, which can invade adjoining tissues via circulation, and spread to other organs in the body. Cancer can be initiated anywhere in the body, where damaged cells grow and multiply where they shouldn't. These cells form tumors, also called neoplasm an abnormal mass of cells. Tumors can be non-cancerous (benign) and cancerous (malignant). Cancers are grouped according to their origin of tissue or organ. Four major types of cancers. Carcinomas are malignancies that begin in the epithelial cells, which make up the skin, and tissues that line other internal organs. Examples of carcinomas involved are prostate cancer, breast cancer, lung cancer, and colorectal cancer. Sarcomas is a type of cancer that starts in tissues like bone or soft tissues and connective tissues. Leukemias are cancer of the white blood cells, which begins in the bone marrow as the bone marrow produces an excessive amount of abnormal white blood cells, that do not function properly. There are 4 major types of leukemia acute lymphocytic leukemia, chronic lymphocytic leukemia, acute myelogenous leukemia, and chronic myelogenous leukemia. Lymphoma a cancer that begins in the lymphatic system, the lymphatic system includes the lymph nodes, spleen, thymus gland, and other network of vessels. There are main types of lymphomas Hodgkin's lymphoma and non-Hodgkin's lymphomas. And there are also other types of cancer in overview, cancer is a condition where cells multiply abnormally over time. The cells divide and grow rebelliously, they invade surrounding tissues and spread to distant parts of the body. In the course of time, the mass of the cancer cells can get massive enough to make lumps (tumors) that can be felt or seen. But not all tumors are cancer.

Keywords: Cancer, Tumor, Benign, Malignant, Carcinoma, Sarcomas; Leukemias; Lymphoma, Acute Lymphocytic Leukemia.

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Green Approaches in Radiopharmaceuticals Synthesis: A New Era of Safety and Efficacy

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Abstract

Radiopharmaceuticals are vital tools in nuclear medicine for diagnostic imaging and targeted radionuclide therapy. However, their conventional synthesis often relies on toxic solvents, hazardous reagents, and energy-intensive procedures that pose environmental and occupational risks. Green chemistry offers a transformative pathway by introducing sustainable, efficient, and safer methodologies for radiopharmaceutical production. These abstract highlights key eco-friendly strategies including aqueous-phase radiolabelling, plant-mediated reduction, solvent-free microreactor-based synthesis, microwave-assisted radiochemistry, and the use of biodegradable chelators. These approaches significantly reduce toxic waste, minimize radiation exposure to technicians, enhance radiochemical yield, and improve biocompatibility of final formulations. The integration of renewable resources, minimal solvent systems, and energy-efficient technologies establishes a cleaner and more reliable workflow for producing PET and SPECT radiopharmaceuticals. Moreover, green techniques support global sustainability standards, reduce production costs, and improve patient safety by lowering residual chemical impurities. As nuclear medicine continues to advance, adopting green approaches in radiopharmaceutical synthesis represents a crucial step toward developing next-generation radiopharmaceuticals that are not only effective but also environmentally responsible. This new era emphasizes sustainability, operational safety, and enhanced therapeutic efficacy in clinical and research applications.

Keywords: Green chemistry, Radiopharmaceuticals, Radiochemistry, Microwave-assisted synthesis, Biodegradable chelators, nuclear medicine.

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Artificial Intelligence in Cancer and Radiopharmaceutical Research: Ethical Consideration and Governance Challenges

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Abstract

Artificial intelligence are breaking into biomedical research and health care, which importantly includes cancer research and oncology, where the potential applications are vast. These include detection and diagnosis of cancer, subtype classification, optimization of cancer treatment and identification of new therapeutic targets in drug discovery. This research article explores the dynamic field of radiopharmaceuticals, where innovative developments arise from combining radioisotopes and pharmaceuticals, opening up exciting therapeutic possibilities. The in-depth exploration covers targeted drug delivery, delving into passive targeting through enhanced permeability and retention, as well as active targeting using ligand-receptor strategies. The legal and ethical issues that confront society due to Artificial Intelligence (AI) include privacy and surveillance, bias or discrimination, and potentially the philosophical challenge is the role of human judgment. Concerns about newer digital technologies becoming a new source of inaccuracy and data breaches have arisen as a result of its use. The governance of AI applications is crucial for patient safety and accountability and for raising healthcare professional's belief in enhancing acceptance and boosting significant health consequences. Since COVID-19 hit the global health system, the concept of AI has created a revolution in healthcare, and such an uprising could be another step forward to meet future healthcare needs.

Keywords: Artificial intelligence, Cancer, Radiopharmaceutical

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Ethical, Technical, and Governance Considerations in AI-Enabled Radiopharmaceutical Drug Discovery

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Abstract

Artificial Intelligence (AI) has rapidly evolved into a critical enabler of radiopharmaceutical drug discovery, supporting automated hit identification, molecular docking, radiotracer optimization, and predictive assessment of pharmacokinetic and radiobiological properties. Machine-learning models, particularly deep neural networks and generative architectures, accelerate the development of radio-labeled compounds by analyzing complex multimodal datasets derived from nuclear imaging, radiochemistry, and molecular biology. Key concerns include dataset bias affecting molecular prediction accuracy, opacity of black-box models used for radiotracer design, vulnerabilities associated with synthetic data generation, and the possibility of AI-assisted creation of biologically harmful agents. Additionally, the dependence on clinical imaging repositories raises issues regarding data privacy, informed consent, and long-term stewardship of radioactive and biomedical datasets. To address these gaps, the study evaluates current national and international regulatory mechanisms governing AI in drug development, identifies limitations in existing radiopharmaceutical oversight structures, and proposes a multilayered governance framework. This framework emphasizes algorithmic transparency, validation against radiobiological benchmarks, human-in-the loop decision protocols, risk-aware model deployment, and ethical review pathways tailored to nuclear research environments. By integrating ethical principles with technical safeguards, this work aims to guide researchers, regulators, and nuclear medicine institutions toward responsible and accountable adoption of AI for radiopharmaceutical drug discovery, ensuring scientific innovation aligns with patient safety, public trust, and global biosecurity.

Keywords: AI-enabled Drug Discovery, Radiopharmaceuticals, Nuclear Medicine, Machine Learning Ethics, Algorithmic Bias

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Colorectal Cancer: From Epidemiology to Oncotherapies

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Abstract

Colorectal cancer (CRC) exhibits an incidence rate of 10% and ranks as the third leading cause of mortality globally, following breast and lung cancer. Clinical manifestations of colorectal cancer appear at the advanced stages of the disease, with a significant interval between polyp development and cancer onset. GLOBOCAN data projected the incidence and death rates of colorectal cancer from 2022 to 2050. A detailed literature study has clarified the strategies regarded as novel options for CRC treatment, including targeted therapy and immunotherapy. A range of conventional treatments exists for colorectal cancer, encompassing surgical procedures, chemotherapy, and radiation therapy. Despite notable progress in traditional therapies, the management and prevention of colorectal cancer remain formidable problems due to disease recurrence and chemotherapy resistance. Diverse methodologies have demonstrated encouraging effects in patient care; however, additional research and clinical trials are essential to augment their efficacy.

Keywords: Colorectal cancer, subtypes, epidemiology, chemotherapy, targeted therapy.

BRNS/RCP/25/P-67

Current AI Technologies in Cancer Diagnostics and Treatment

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Abstract

Cancer is a disease that affects people regardless of age and causes suffering all around the world. Cancer continues to be a significant international health issues, which demands the invention of new methods for early detection, precise diagnoses and personalized treatment. AI has rapidly become a ground breaking component in the modern era of oncology. Also explored applications of AI in genomics and biomarker discovery, liquid biopsies, and non-invasive diagnosis. The review also evaluates the effect of AI on radiation therapy, robotic surgery and patient management, including survival predictions, remote monitoring and AI-facilitated clinical trials. This review highlights the general breaking potential of AI to revolutionize cancer care by making diagnostics, treatment and patient management more precise, efficient and personalized. AI plays a transformative role in modern oncology by enhancing cancer detection, diagnosis, treatment planning, and patient management. Advanced machine-learning models analyze medical image such as CT scan, MRI and mammogram with high accuracy, allowing earlier and more precise tumor identification. All over, AI accelerates clinical decision-making, supports precision oncology, and significantly improves the quality of cancer management.

Keywords: Artificial intelligence, Cancer, Non-invasive diagnoses, Management of Cancer.

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Current AI Technologies in Nuclear Medicine

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Abstract

Nuclear medicine has always been valued for its ability to show what is happening inside the body at a functional level, something that traditional imaging alone cannot fully capture. In recent years, the field has been undergoing a noticeable shift as artificial intelligence tools begin to integrate into everyday practice. These technologies are helping improve the clarity of PET and SPECT images, reducing noise, and making it easier to identify and measure lesions with greater confidence. AI is also finding a place in hybrid imaging such as PET/CT and PET/MRI, where it supports faster reconstruction and more reliable interpretation. Beyond imaging, researchers are using AI to predict radiation dose, guide radionuclide therapies, and even assist in developing new tracers. Many hospitals are also beginning to adopt AI-based systems to smoothen clinical workflows and ensure that patients receive the lowest radiation dose necessary. This review looks at the current advances in AI within nuclear medicine and how these developments are contributing to more accurate diagnoses, better-planned treatments, and an overall improvement in patient care.

Keywords: Artificial Intelligence, Nuclear Medicine, PET/CT, Functional Imaging, Dosimetry, Radionuclide Therapy.

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AI-Enhanced Molecular Docking and Computational Oncology: Accelerating Cancer Drug Discovery and Therapeutic Innovation

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Abstract

Cancer continues to pose a significant global health challenge, driven by tumor heterogeneity, resistance to therapy, and the high expense of drug development. Emerging approaches such as artificial intelligence (AI) and molecular docking are reshaping the landscape of oncology research by accelerating the discovery of new anti-cancer agents and optimizing early-stage drug design. This work examines the application of AI-assisted molecular docking in cancer studies, with emphasis on critical proteins involved in tumor progression, including kinases, oncogenic receptors, and DNA-repair enzymes. The framework integrates machine learning–based scoring models, molecular dynamics simulations, and multi-omics datasets to strengthen hit identification, forecast drug–target interactions, and minimize false positives.

Keywords: - cancer, molecular docking, artificial intelligence, oncogenic receptors, target therapy.

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Cancer

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Abstract

Cancer remains one of the leading causes of morbidity and mortality worldwide, driven by complex interactions between genetic alterations, environmental exposures, and dysregulated cellular pathways. Recent advances in molecular oncology have significantly improved our understanding of tumor initiation, progression, and metastasis. This study evaluates emerging concepts in cancer biology with a focus on early detection, therapeutic resistance, and targeted treatment strategies. Increasing evidence suggests that genomic instability and epigenetic modifications initiate oncogenesis by altering key signaling pathways such as PI3K/AKT, RAS/RAF/MEK, and p53. Furthermore, the tumor microenvironment—including immune cells, fibroblasts, and extracellular matrix components—plays a critical role in promoting malignant behavior and shaping treatment response. Advancements in high-throughput sequencing and biomarker discovery have facilitated earlier diagnosis and informed precision medicine approaches. However, therapeutic resistance remains a major challenge, often arising through clonal evolution, drug efflux, or adaptive metabolic reprogramming. Novel modalities such as immunotherapy, including immune checkpoint inhibitors and CAR-T cell therapies, have demonstrated durable responses in several cancer types but are limited by heterogeneous patient outcomes and immune-related toxicities. Combination therapies targeting multiple pathways simultaneously are emerging as promising strategies to overcome resistance and enhance treatment efficacy. This abstract highlights the importance of integrating molecular insights with clinical innovation to improve cancer management. Continued research into tumor biology, patient-specific biomarkers, and therapeutic optimization is essential to develop more effective, less toxic treatment strategies and ultimately reduce the global burden of cancer.

Keyword - Cancer, morbility,CAR-T, p53, pathway

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Clinical pharmacy and Pharmacovigilance

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Abstract

Clinical pharmacy and Pharmacovigilance are integral components of modern healthcare systems, working together to optimize medication therapy, ensure patient safety, and improve therapeutic outcomes. Clinical pharmacy focuses on the rational use of medicines through direct patient care, medication therapy management, and interprofessional collaboration. Clinical pharmacists play a vital role in assessing drug therapy, identifying potential drug-related problems, and providing evidence-based recommendations to enhance treatment effectiveness. Their involvement in patient counseling, dose adjustments, and therapeutic drug monitoring contributes significantly to improving medication adherence and reducing preventable adverse events. Pharmacovigilance, on the other hand, is the science and practice of detecting, assessing, understanding, and preventing adverse drug reactions (ADRs) and other drug-related problems. It ensures ongoing monitoring of medication safety throughout the drug's lifecycle, from pre-marketing trials to post-marketing surveillance. By collecting and analyzing ADR reports from healthcare professionals and patients, pharmacovigilance systems help identify previously unrecognized risks, support regulatory decisions, and strengthen public health protection. The integration of clinical pharmacy and pharmacovigilance enhances patient-centered care by promoting early identification of medication risks, improving reporting practices, and implementing strategies to minimize harm. Together, Strengthening these fields through education, training, and technological innovations is essential for advancing medication safety and fostering a safer healthcare environment

Keyword- Pharmacovigilance, adverse drug reactions (ADRs), Medication, Clinical pharmacy

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Design, Synthesis and Characterization of New Hydrazone Substituted Derivatives and Evaluation of Antimicrobial Activity

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Abstract

The swift rise of resistance among bacteria and fungi to current antimicrobial treatments has become a significant global issue, underscoring the pressing need for new and more effective therapeutic options. This study involved the synthesis and comprehensive characterization of a novel series of coumarin hydrazone derivatives, utilizing ^{1}H NMR, ^{13}C NMR, and LC/MS spectral analyses. These compounds were assessed for drug-likeness and pharmacokinetic properties based on Lipinski's Rule of Five, and their structural similarity was evaluated using the PubChem and CAS Sci Finder databases. In silico predictions revealed that all synthesized coumarin derivatives had favourable drug-likeness scores, adhered to Lipinski's criteria, and showed promising oral bioavailability. The antimicrobial properties of the synthesized compounds were tested using the agar well diffusion method against Gram-positive (Staphylococcus aureus), Gram-negative (Escherichia coli), and fungal (Aspergillus niger) strains. Among the derivatives tested, compounds 6C-1 and 6C-4 demonstrated the strongest antibacterial activity against E. coli and S. aureus, with inhibition zones measuring 0.8–1.0 cm and 0.3–0.5 cm, respectively. Notably, compound 6C-1 also showed significant antifungal activity against A. niger, with a 0.5 cm inhibition zone. These results indicate that the synthesized coumarin derivatives have promising antimicrobial potential and could be used as lead scaffolds for developing new therapeutic agents effective against resistant microbial strains.

Keywords- Resistance, Hydrazone, PubChem, CAS Sci Finder, Scaffolds

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Drug Discovery

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Abstract

Cancer remains one of the leading causes of morbidity and mortality worldwide, driven by complex interactions between genetic alterations, environmental exposures, and dysregulated cellular pathways. Recent advances in molecular oncology have significantly improved our understanding of tumor initiation, progression, and metastasis. This study evaluates emerging concepts in cancer biology with a focus on early detection, therapeutic resistance, and targeted treatment strategies. Increasing evidence suggests that genomic instability and epigenetic modifications initiate oncogenesis by altering key signaling pathways such as PI3K/AKT, RAS/RAF/MEK, and p53. Furthermore, the tumor microenvironment—including immune cells, fibroblasts, and extracellular matrix components—plays a critical role in promoting malignant behavior and shaping treatment response. Advancements in high-throughput sequencing and biomarker discovery have facilitated earlier diagnosis and informed precision medicine approaches. However, therapeutic resistance remains a major challenge, often arising through clonal evolution, drug efflux, or adaptive metabolic reprogramming. Novel modalities such as immunotherapy, including immune checkpoint inhibitors and CAR-T cell therapies, have demonstrated durable responses in several cancer types but are limited by heterogeneous patient outcomes and immune-related toxicities. Combination therapies targeting multiple pathways simultaneously are emerging as promising strategies to overcome resistance and enhance treatment efficacy. This abstract highlights the importance of integrating molecular insights with clinical innovation to improve cancer management. Continued research into tumor biology, patient-specific biomarkers, and therapeutic optimization is essential to develop more effective, less toxic treatment strategies and ultimately reduce the global burden of cancer.

Keyword- Cancer, CAR-T, oncogenesis, biomarker

BRNS/RCP/25/P-74

Network Pharmacology-Based Identification of Anti-Cancer Compounds from *Withania somnifera* Using Molecular Docking and Simulation Studies.

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Abstract

Ashwagandha, or *Withania somnifera*, is a well-known medicinal plant with strong therapeutic qualities, including anticancer activity. The molecular mechanisms and particular bioactive compounds responsible for its anticancer effects are still not fully understood, despite its widespread traditional use. In order to systematically identify and assess the anticancer potential of *W. somnifera* phytochemicals, this study combines network pharmacology with molecular docking and molecular dynamics (MD) simulation.Data on phytochemicals were gathered from databases of natural products and published literature. A protein–protein interaction (PPI) network was built to identify important hub genes, and potential targets linked to cancer were predicted using network pharmacology platforms. To identify the pertinent biological processes and signaling pathways, Gene Ontology (GO) and KEGG pathway analyses were carried out. Among the bioactive substances, withanolides, such as withaferin A, withanone, and withanolide D, showed strong predicted interactions with important oncogenic targets like BCL-2, TP53, and NF-κB. Studies using molecular docking showed strong hydrogen-bond interactions and advantageous binding energies. Furthermore, acceptable pharmacokinetic properties were indicated by ADME and drug-likeness predictions. The integrated computational approach identifies particular bioactive compounds as promising candidates for the development of anticancer drugs and offers a mechanistic understanding of *W. somnifera's* anticancer activity. These results provide a solid basis for further experimental validation and possible therapeutic uses.

Keywords- *Withania somnifera*, Network Pharmacology, Molecular Docking, Molecular Dynamics

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Breast Cancer in India Present Scenario and its Management

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Abstract

Breast cancer has emerged as the most frequently diagnosed cancer among women in India, a shift attributed partly to adopting Westernized lifestyles and increased life expectancy. While the incidence rates in India are lower than in Western nations, the mortality rates are disproportionately high due to a majority of patients (around 60%) presenting at advanced stages (Stage III or IV).Indian women are typically diagnosed a decade younger than their Western counterparts, with the peak incidence in the 40-50 age group. There is a higher prevalence of aggressive subtypes like triple-negative breast cancer (TNBC) and HER2-positive tumors, which often have a poorer prognosis. Lack of awareness, social stigma, financial constraints, and an absence of a national population-based screening program contribute significantly to delayed diagnosis. Key management aspects and challenges include Early Detection and breast awareness. The different treatments are Surgery, Systemic Therapy, Radiotherapy**.** While clinical management in centers of excellence is on par with global standards, the broader challenge in India lies in bridging the gap in awareness, accessibility, and affordability of quality care to improve overall survival rates. Efforts must focus on early detection strategies suitable for the Indian context and policy reforms to ensure equitable access to comprehensive care.

Keywords- triple-negative breast cancer, Breast cancer, Radiotherapy

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Assessment of Anticancer Activity of *Rumex vesicarius* (L.) Extracts on Colorectal Cancer

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Abstract

One of the main causes of cancer-related morbidity and mortality globally is colorectal cancer, and as its incidence rises, better and more efficient treatment methods must be developed. Because they can target several pathways with few side effects, natural plant-based medicines have gained a lot of attention in anticancer research. *Rumex vesicarius* (L.), a common medicinal herb, is known to contain a variety of phytochemicals, including flavonoids, phenols, tannins, and anthraquinones. It has been used traditionally for a number of therapeutic uses. These compounds have been linked to cytoprotective, anti-inflammatory, and antioxidant properties. The goal of this study is to determine whether *Rumex vesicarius* leaf extract has anticancer properties against colorectal cancer in vitro. Standard in vitro testing systems were used to synthesize the plant extract and assess it on colorectal cancer cell lines. Growth inhibition and cytotoxicity characteristics were analyzed to determine anticancer potential. According to the initial findings, *R. vesicarius* has a dose-dependent inhibitory effect on the growth of cancer cells, suggesting the existence of strong bioactive components. The results also lend credence to the theory that the extract might disrupt important biological functions necessary for the survival and growth of cancer cells. This study demonstrates *Rumex vesicarius's* potential as an effective natural remedy for colorectal cancer. To determine active chemicals, molecular processes, and cytotoxic selectivity versus normal cells, more research is needed. The results of this study motivate further investigation of *Rumex vesicarius* in the field of cancer therapies and offer a scientific foundation for the potential creation of anticancer formulations based on the plant.

Key words- *Rumex vesicarius*; Colorectal cancer; In vitro; Anticancer activity; Phytochemicals; Cytotoxicity; Plant extract; Natural therapeutics; Cancer cell lines

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Drug Discovery

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Abstract

Drug discovery is a multidisciplinary scientific process aimed at identifying new therapeutic agents that can prevent, treat, or cure diseases. It integrates principles from medicinal chemistry, pharmacology, molecular biology, computational science, and clinical research to translate biological insights into effective medicines. The process typically begins with target identification, where a biological molecule—such as a protein, enzyme, or receptor—linked to a specific disease is recognized. Once validated, high-throughput screening and computational drug-design techniques are employed to evaluate millions of chemical compounds for potential activity against the target. Advances in artificial intelligence, structural biology, and genomics have significantly accelerated this step by improving the prediction of molecular interactions and enhancing hit-to lead optimization. Lead compounds identified during screening undergo further refinement to improve potency, selectivity, pharmacokinetics, and safety profiles. Preclinical studies, conducted in vitro and in vivo, help determine toxicity, metabolism, and dosing requirements. Only a small fraction of lead candidates advance to clinical trials, which are conducted in three phases to evaluate safety, efficacy, and long-term effects in humans. Despite the high cost, long timelines, and substantial failure rates, drug discovery has evolved through technological innovations such as CRISPR-based gene editing, omics technologies, machine learning–driven virtual screening, and phenotypic screening approaches, all of which enhance the efficiency and precision of the process. Modern drug discovery also emphasizes personalized medicine, aiming to develop therapies tailored to the genetic and molecular profiles of individual patients. Overall, drug discovery remains a critical scientific endeavor that continues to evolve, providing new opportunities for treating complex diseases and improving global health outcomes.

Keyword- drug discovery therapeutic agent structure based drug design.

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Drug Discovery

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Abstract

Drug discovery is a multidisciplinary scientific process aimed at identifying new therapeutic agents that can prevent, treat, or cure diseases. It integrates principles from medicinal chemistry, pharmacology, molecular biology, computational science, and clinical research to translate biological insights into effective medicines. Once validated, high-throughput screening and computational drug-design techniques are employed to evaluate millions of chemical compounds for potential activity against the target. Advances in artificial intelligence, structural biology, and genomics have significantly accelerated this step by improving the prediction of molecular interactions and enhancing hit-to lead optimization. Lead compounds identified during screening undergo further refinement to improve potency, selectivity, pharmacokinetics, and safety profiles. Preclinical studies, conducted in vitro and in vivo, help determine toxicity, metabolism, and dosing requirements. Only a small fraction of lead candidates advance to clinical trials, which are conducted in three phases to evaluate safety, efficacy, and long-term effects in humans. Despite the high cost, long timelines, and substantial failure rates, drug discovery has evolved through technological innovations such as CRISPR-based gene editing, omics technologies, machine learning–driven virtual screening, and phenotypic screening approaches, all of which enhance the efficiency and precision of the process. Modern drug discovery also emphasizes personalized medicine, aiming to develop therapies tailored to the genetic and molecular profiles of individual patients. Overall, drug discovery remains a critical scientific endeavor that continues to evolve, providing new opportunities for treating complex diseases and improving global health outcomes.

Keyword- CRISPR, multidisciplinary, OMIC, diseases

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Drug Discovery

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Abstract

Drug discovery is a multidisciplinary scientific process aimed at identifying new therapeutic agents that can prevent, treat, or cure diseases. It integrates principles from medicinal chemistry, pharmacology, molecular biology, computational science, and clinical research to translate biological insights into effective medicines. The process typically begins with target identification, where a biological molecule—such as a protein, enzyme, or receptor—linked to a specific disease is recognized. Once validated, high-throughput screening and computational drug-design techniques are employed to evaluate millions of chemical compounds for potential activity against the target. Advances in artificial intelligence, structural biology, and genomics have significantly accelerated this step by improving the prediction of molecular interactions and enhancing hit-to lead optimization.Lead compounds identified during screening undergo further refinement to improve potency, selectivity, pharmacokinetics, and safety profiles. Preclinical studies, conducted in vitro and in vivo, help determine toxicity, metabolism, and dosing requirements. Only a small fraction of lead candidates advance to clinical trials, which are conducted in three phases to evaluate safety, efficacy, and long-term effects in humans. Despite the high cost, long timelines, and substantial failure rates, drug discovery has evolved through technological innovations such as CRISPR-based gene editing, omics technologies, machine learning–driven virtual screening, and phenotypic screening approaches, all of which enhance the efficiency and precision of the process. Modern drug discovery also emphasizes personalized medicine, aiming to develop therapies tailored to the genetic and molecular profiles of individual patients. Overall, drug discovery remains a critical scientific endeavor that continues to evolve, providing new opportunities for treating complex diseases and improving global health outcomes.

Keywords- CRISPR, multidisciplinary, OMIC, diseases

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Clinical Pharmacy and Pharmacovigilance

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Abstract

Clinical pharmacy and pharmacovigilance are integral components of modern healthcare systems, working together to optimize medication therapy, ensure patient safety, and improve therapeutic outcomes. Clinical pharmacy focuses on the rational use of medicines through direct patient care, medication therapy management, and interprofessional collaboration. Clinical pharmacists play a vital role in assessing drug therapy, identifying potential drug-related problems, and providing evidence-based recommendations to enhance treatment effectiveness. Their involvement in patient counseling, dose adjustments, and therapeutic drug monitoring contributes significantly to improving medication adherence and reducing preventable adverse events. Pharmacovigilance, on the other hand, is the science and practice of detecting, assessing, understanding, and preventing adverse drug reactions (ADRs) and other drug-related problems. It ensures ongoing monitoring of medication safety throughout the drug's lifecycle, from pre-marketing trials to post-marketing surveillance. By collecting and analyzing ADR reports from healthcare professionals and patients, pharmacovigilance systems help identify previously unrecognized risks, support regulatory decisions, and strengthen public health protection. The integration of clinical pharmacy and pharmacovigilance enhances patient-centered care by promoting early identification of medication risks, improving reporting practices, and implementing strategies to minimize harm. Together, Strengthening these fields through education, training, and technological innovations is essential for advancing medication safety and fostering a safer healthcare environment.

Keyword- pharmacovigilance, Clinical pharmacy, technological, adverse drug reactions (ADRs)

BRNS/RCP/25/P-81

Cancer

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Abstract

Cancer is a disease in which certain cells of the body begin to grow and divide uncontrollably. These abnormal cells can form lumps called tumors, spread to other parts of the body, and interfere with normal bodily functions. There are many types of cancers, such as lung, breast, blood, and skin cancers, each developing differently and requiring specific methods of diagnosis and treatment. Early detection through screening and awareness greatly improves the chances of successful treatment. Modern medicine uses a combination of surgery, chemotherapy, radiation therapy, immunotherapy, and targeted drugs to treat cancer. Although it remains a major health challenge, ongoing research and new medical technologies continue to improve survival rates and offer better support to patients. Cancer awareness, timely diagnosis, and healthy lifestyle choices play an important role in prevention and management.

Keywords: Cancer**,** prevention, management

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Biotechnology and Life Science in Artificial Intelligence

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Abstract

Biotechnology is an application science combining the latest achievements of modern bio-science with the latest engineering technology. Biotechnology, defined by the organization of economic cooperation and development, is a technology that serves the community using microorganism, animals and plants as a reactor for processing materials in order to provide, products by means of natural science and engineering principles. Life science are a science which studies the nature and phenomenon of life activities in living things, as well as the relationship between lives and their living environment. Includes many disciplines like biology, biochemistry, genetics, and microbiology. Ex. Researching how a disease spreads, studying cell structures, or mapping an organism's genome. established the double helix model of DNA, marketing the birth of molecular biology. AI's role in biotechnology and life sciences is revolutionizing drug discovery, personalized medicine, genomics, and diagonstics through applications like machine learning, robotics, and data analytics.

Keywords- Genetic engineering, pcr, cloning, genomics and bioinformatics.

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Nuclear Medicine

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Abstract

Nuclear medicine is a specialized branch of medical science that utilizes radioactive isotopes, or radiopharmaceuticals, to diagnose and treat various diseases, primarily cancers, cardiovascular conditions, and neurological disorders. The key advantage of nuclear medicine lies in its ability to visualize the function of organs and tissues in real-time, offering insights into the physiological processes underlying disease. Unlike conventional imaging techniques, nuclear medicine provides functional imaging, which is essential for detecting diseases at an early stage, even before anatomical changes are visible. Techniques such as positron emission tomography (PET) and single-photon emission computed tomography (SPECT) have revolutionized the diagnostic capabilities in oncology, cardiology, and neurology, enabling clinicians to make more accurate and personalized treatment decisions. In therapeutic applications, targeted radiotherapy is used to deliver precise doses of radiation to cancer cells while minimizing damage to surrounding healthy tissues. This has led to improved outcomes in the treatment of certain cancers, such as thyroid, prostate, and lymphoma. Recent advancements in radiopharmaceutical development, as well as innovations in imaging technologies, have enhanced the efficacy and safety of nuclear medicine treatments. Additionally, emerging applications of theranostics, which combine therapy and diagnostic imaging, hold great promise for personalized medicine. Despite its potential, nuclear medicine faces challenges such as limited accessibility, regulatory concerns, and the potential risks associated with radiation exposure. However, ongoing research and technological advancements continue to expand its role in both clinical practice and research, positioning nuclear medicine as a cornerstone of modern healthcare for diagnosis, treatment, and personalized medicine.

Keywords- Nuclear medicine, radiopharmaceuticals, PET, SPECT, functional imaging, targeted radiotherapy

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Radio-Pharmaceuticals

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Abstract

Radiopharmaceuticals Involve The Local Delivery Of Radionuclides To Targeted Lesions For The Diagnosis And Treatment Of Multiple Diseases. Radiopharmaceutical Therapy, Which Directly Causes Systematic And Irreparable Damage To Targeted Cells, Has Attracted Increasing Attention In The Treatment Of Refractory Diseases That Are Not Sensitive To Current Therapies. The New Generation Of Radiopharmaceuticals Utilizes A Targeting Vector To Achieve The Accurate Delivery Of Radionuclides To Lesions And Avoid Off-Target Deposition, Making It Possible To Improve The Efficiency And BIOSAFETY Of TUMOUR Diagnosis And Therapy. Numerous Studies Have Focused On Developing Novel Radiopharmaceuticals Targeting A Broader Range Of Disease Targets, Demonstrating Remarkable In Vivo Performance. These Include High Tumor Uptake, Prolonged Retention Time, And Favorable Pharmacokinetic Properties That Align With Clinical Standards. While RADIOTHERANOSTICS Have Been Widely Applied In Tumor Diagnosis And Therapy, Their Applications Are Now Expanding To Neurodegenerative Diseases, Cardiovascular Diseases, And Inflammation. Furthermore, RADIOTHERANOSTIC-Empowered Precision Medicine Is Revolutionizing The Cancer Treatment Paradigm. Diagnostic Radiopharmaceuticals Play A Pivotal Role In Patient Stratification And Treatment Planning, Leading To Improved Therapeutic Outcomes In Targeted Radionuclide Therapy. This Review Offers A Comprehensive Overview Of The Evolution Of Radiopharmaceuticals, Including Both FDA-Approved And Clinically Investigated Agents, And Explores The Mechanisms Of Cell Death Induced By Radiopharmaceuticals. It Emphasizes The Significance And Future Prospects Of THERANOSTIC-Based Radiopharmaceuticals In Advancing Precision Medicine.

Keywords- Biosafety of Tumour, Radionuclides For Nuclear Medicines, Radiotheranostic, Neurodegenerative Diseases, Cardiovascular Diseases.

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Formulation, Evaluation and Optimization of Metformin 500 SR tablet

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Abstract

A number of terms have been used to describe the oral dosage forms that represent modified release properties; which include delayed release, repeated action, prolonged release, sustained release, extended release and controlled release. Each drug delivery system is focused at eliminating the cyclical changes in plasma drug concentration seen after administration of conventional delivery systems. Modified release dosage forms are designed to provide quick achievement of a drug plasma level that remains constant at a value within the therapeutic range of a drug for a significant period of time or achievement of a plasma concentration of a drug that delivers at a slow rate (i.e. sustained release) that stays within the therapeutic range for a longer period of time. On the basis of result obtained from evaluation of metformin tablets. It was found that on the basis of angle of repose, Bulk density, Tapped density was determined and tablets Haunser ratio was 1.09 to 1.23. Cars index 9.02 to 16.53(%) which showed that tablet could maintain its physical integrity, content uniformity and homogeneity in preparation. Friability of tablet indicates that tablets possess sufficient mechanical strength. Weight variation of tablet was also determined and tablet showed drug content 97.33+0.48 % to 98.79±0.78% indicating the content uniformity and homogeneity in preparation. In-vitro drug release study was also performed and drug release study revealed that tablet was able to release approx. 11-19% in hours and followed approx. 80-90% release of drug in 10-12 hrs. On the basis of these performed test and analysis it is concluded that formulation shows good results.

Keyword- In vitro, controlled release, tablet, formulation

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Role of Artificial Intelligence in Modern Pharmacy and Therapeutic Management

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Abstract

Artificial Intelligence (AI) has become a transformative force in modern pharmacy and therapeutic management, offering advanced tools to enhance accuracy, efficiency, and patient-centered care. AI-driven systems analyze large datasets, including medical records, pharmaceutical databases, and real-time patient information, to predict disease progression, optimize treatment responses, and assess drug safety. In drug discovery, AI accelerates the identification of novel drug molecules, evaluates their pharmacological potential, and streamlines clinical trial design, significantly reducing time and cost involved in traditional research processes. In pharmacy practice, AI-enabled clinical decision-support systems assist pharmacists and healthcare professionals in selecting appropriate medications, determining precise dosages, and minimizing medication errors. AI also supports personalized medicine by creating individualized treatment plans based on genetic profiles, lifestyle factors, and therapeutic history, ensuring improved patient outcomes. Additionally, automated dispensing robots and AI-based inventory management systems enhance the accuracy, safety, and efficiency of medication dispensing. Telepharmacy systems and AI-powered virtual assistants expand access to pharmaceutical care, offering remote consultation, prescription verification, and patient education, especially in underserved regions. However, challenges such as data privacy, algorithmic bias, and the need for ethical AI implementation remain critical areas of concern. Overall, AI plays a pivotal role in advancing pharmacy practice, promoting safer drug use, improving therapeutic effectiveness, and shaping the future of healthcare delivery through intelligent, data-driven solutions.

Keywords- Artificial Intelligence, Pharmacy Practice, Drug Discovery, Personalized Medicine, Clinical Decision Support

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Artificial Intelligence

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Abstract

Artificial Intelligence (AI) is transforming industries and society at an unprecedented pace, reshaping the way humans interact with technology and how systems process and analyze data. AI encompasses a wide range of techniques, including machine learning, deep learning, natural language processing (NLP), and computer vision, which allow systems to learn, adapt, and perform tasks that traditionally required human intelligence. The growth of AI has led to significant advancements in various sectors, including healthcare, finance, education, transportation, and manufacturing.In healthcare, AI-powered systems are enhancing diagnostic accuracy, enabling personalized treatment plans, and optimizing drug discovery processes. Machine learning algorithms can analyze large datasets of medical records to identify patterns and predict disease outcomes, providing doctors with valuable insights for patient care. In finance, AI is revolutionizing areas like fraud detection, algorithmic trading, and customer service through chatbots and virtual assistants.AI is also at the core of autonomous systems, such as self-driving cars, drones, and robots, which are transforming transportation and logistics industries. In education, AI is being used to personalize learning experiences, helping students progress at their own pace and providing teachers with real-time feedback on student performance.Despite its tremendous potential, AI raises significant ethical and societal concerns, including data privacy, algorithmic bias, job displacement, and the need for transparent and accountable AI systems. The future of AI holds immense promise, with ongoing research and innovation poised to unlock new possibilities in areas such as human-computer interaction, creativity, and problem-solving, shaping a smarter and more efficient world.

Keywords- Artificial Intelligence, Machine Learning, Deep Learning, Natural Language Processing, Computer Vision

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Biotechnology and Life Science

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Abstract

Biotechnology and life sciences have become central to the advancement of medicine, agriculture, environmental sustainability, and industrial processes. These fields leverage biological systems, organisms, or derivatives to develop innovative solutions to pressing global challenges. Biotechnology encompasses a broad spectrum of applications, including genetic engineering, drug development, and bioprocessing, aiming to enhance human health, improve crop yields, and produce renewable energy. The convergence of molecular biology, genomics, and bioinformatics has revolutionized our understanding of complex biological processes, enabling precision medicine and the development of tailored therapies for previously untreatable diseases. Life sciences, broadly speaking, study the structure, function, growth, and evolution of living organisms, including humans, animals, plants, and microorganisms. This research drives advancements in diagnostics, therapeutics, agriculture, and environmental conservation. With emerging technologies like CRISPR gene editing, synthetic biology, and systems biology, the possibilities for innovation are vast. However, the integration of biotechnology into society raises ethical, regulatory, and safety considerations that must be addressed to ensure responsible development and application. This abstract provides an overview of the transformative role of biotechnology and life sciences in addressing global challenges and improving quality of life.

Keywords- Biotechnology, life sciences, genetic engineering, drug development, bioprocessing, precision medicine, genomics, CRISPR

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Clinical Pharmacy and Pharmacovigilance

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Abstract

Clinical pharmacy and pharmacovigilance are integral components of modern healthcare, aimed at optimizing medication therapy and ensuring patient safety. Clinical pharmacy focuses on the application of pharmaceutical knowledge to enhance patient care through medication management, patient counseling, and the provision of therapeutic recommendations. Clinical pharmacists work closely with healthcare teams to ensure that patients receive the most appropriate, effective, and safe medications for their conditions. They are involved in drug selection, dosage optimization, monitoring for adverse effects, and educating patients about proper medication use. Pharmacovigilance, on the other hand, is the science and activities related to the detection, assessment, understanding, and prevention of adverse drug reactions (ADRs) or any other drug-related problems. It plays a critical role in the post-marketing surveillance of pharmaceutical products, ensuring that medications on the market continue to meet safety standards. The goal of pharmacovigilance is to identify and minimize risks associated with drug use, particularly as drugs are used in diverse populations outside of clinical trials. By collecting and analyzing data on ADRs, pharmacovigilance helps inform regulatory decisions, improve drug safety profiles, and guide clinical practice. The collaboration between clinical pharmacy and pharmacovigilance ensures that patients not only receive effective treatments but are also protected from potential harm caused by medications. As the global pharmaceutical market expands and new drugs are introduced, the roles of clinical pharmacy and pharmacovigilance are becoming increasingly important in ensuring the safe and effective use of medications.

Keywords- Clinical pharmacy, pharmacovigilance, adverse drug reactions, medication management, drug safety

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Synthesis, Characterization and Biological Evaluation of Benzimidazole Derivatives.

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Abstract

Benzimidazoles are an important class of compounds with a wide spectrum of biological activity ranging from anti-hypertensive, anti-viral, anti-fungal, antitumor and anthelmintic activity. Benzimidazole rings are the most important nitrogen-containing heterocycles, which are widely explored and utilized by the pharmaceutical industry for drug discovery. Due to their special structural features and electron-rich environment, Benzimidazole containing drugs bind to a variety of therapeutic targets, thereby exhibiting a broad spectrum of bioactivities. Numerous benzimidazole based drugs have been extensively used in the clinic to treat various types of diseases with high therapeutic potential. A series of benzimidazole derivatives were synthesized by a single step process by reacting o-phenylenediamine and benzoic acid. The purity and structure confirmation of the synthesized compounds were done by TLC and 1H-NMR. The compounds were evaluated for anti-microbial, anti-fungal and antioxidant activity.

Keyword- Benzimidazole, antioxidant activity. anti-microbial, anti-fungal, heterocycles

BRNS/RCP/25/P-91

Development of Polymeric Vesicular Systems for Targeted Delivery of Genistein in Skin Cancer Prevention

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Abstract

The objective of proposed research work is lead to the development of novel targeted photoprotective vesicular delivery approaches for sustained drug delivery system of Genistein and Epigallocatechin-3- gallate for higher exposure on site of action to achieve the desired therapeutic potenitial for Nonmelanoma skin cancer (NMSC). Various studies have put forward strong evidences of NMSC incidence due to UV radiation exposure . Genistein is non-toxic, flavonoids (4', 5, 7- trihydroxyisoflavone) which have potential of protection of oxidative and photodynamically damaged DNA. Keratinocyte macrophage cells express macrophage which represents receptor viz. mannose- binding receptor which are having affinity towards mannose. Mannosylated drug loaded vesicular delivery will be prepared by rotary evaporation sonication technique & conjugated by surface adsorption and their optimization using response surface methodology which having three- factored with three level Box- behnken design. Their characterization and evaluation for vesicle size, surface morphology, differential scanning calorimetry (DSC), XRD, % entrapment efficiency, *in vitro* permeation study trough rat abdominal skin will be determined by Franz diffusion cell and stability studies. The MTT assay will be performed against two different cell line, to measure their anticancer potential and their targeting ability. The study thus reveals that mannosylated vesicular delivery approaches can be used as effective drug delivery system for skin cancer treatment encompassing natural drugs.

Keywords: Skin Cancer, Genistein, Epigallocatechin-3- gallate, Sustained release

BRNS/RCP/25/P-92

Nuclear Medicine

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Abstract

Nuclear medicine is a specialized branch of medical science that uses radioactive tracers, known as radiopharmaceuticals, to diagnose, monitor, and treat various diseases. By exploiting the physiological and molecular processes within the body, nuclear medicine provides highly sensitive and functional information that often cannot be obtained through conventional imaging techniques such as X-ray, CT, or MRI. Diagnostic procedures like positron emission tomography (PET) and single-photon emission computed tomography (SPECT) enable visualization of metabolic activity, perfusion, receptor binding, and cellular function, allowing early detection of conditions including cancer, cardiovascular disorders, endocrine dysfunctions, and neurological diseases. The therapeutic aspect of nuclear medicine, known as radionuclide therapy, has expanded significantly. Targeted radionuclide therapies such as radioiodine for thyroid disorders, lutetium-177–based treatments for neuroendocrine tumors, and emerging theranostic approaches combine diagnosis and therapy using the same molecular targets. These advancements enhance treatment precision, minimize systemic toxicity, and improve patient outcomes. Additionally, innovations in instrumentation, hybrid imaging (PET/CT, PET/MRI), and quantitative imaging have improved accuracy, resolution, and diagnostic confidence. Ongoing research focuses on developing novel radiotracers, optimizing dosimetry, and integrating artificial intelligence to refine image interpretation and personalize therapy. Despite challenges related to cost, availability of isotopes, and radiation safety, nuclear medicine continues to evolve as a vital tool in modern healthcare. Its unique ability to assess disease at the molecular level positions it at the forefront of precision medicine, enabling earlier diagnosis, better treatment planning, and improved long-term patient management.

Keyword- SPECT, Nuclear medicine, optimizing dosimetry, MRI

BRNS/RCP/25/P-93

Preparation and Characterization of Polyherbal Immunity Booster Syrup as a Prolongivity Therapy

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Abstract

The growing global interest in natural therapeutics has accelerated the development of polyherbal formulations aimed at enhancing overall health and immunity. The present study focuses on the preparation and characterization of a Chhattisgarh-vegetables–based Polyherbal immunity booster syrup intended for prolongivity therapy. The formulation incorporates selected medicinal plants known for their immunomodulatory, antioxidant, and rejuvenating properties, including Ocimum sanctum (Tulsi), Moringa oleifera (Munga), Azadirachta indica (Neem) Ficus religiosa (Peepal) Murraeya koenigii (Curry leaves). The herbs were processed through aqueous extraction, concentrated, and blended with suitable sweetening and stabilizing agents to obtain a palatable syrup. The prepared formulation was subjected to physicochemical evaluation, including pH, viscosity, specific gravity, total solids, and organoleptic parameters. Preliminary phytochemical screening confirmed the presence of alkaloids, flavonoids, phenolics, tannins, and glycosides, supporting its potential therapeutic value. Antioxidant assays and microbial limit tests were also performed to assess safety and efficacy. The results indicated that the polyherbal syrup demonstrated significant immunomodulatory potential, stable physicochemical characteristics, and acceptable palatability. The results indicate that the polyherbal syrup meets acceptable quality standards and exhibits significant immuno-enhancing potential. This study suggests that the formulation may serve as a promising natural supplement for promoting immunity and supporting long-term health and longevity.

Key words: Immunity Booster Syrup, Chhattisgarh bioactives, Extracts, Longevity, Stability

BRNS/RCP/25/P-94

Leukoplakia As A Tobacco-Linked Oral Disorder

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Abstract

Leukoplakia is still a major concern in oral pathology and is the most common oral potentially malignant disorder. Numerous factors, such as alcohol and tobacco use, oxidative stress, and changes in the oral microbiome, affect it. Its progression is closely linked to molecular alterations like loss of heterozygosity at 3p, 9p, and 17p and p53 abnormalities. Leukoplakia manifests clinically as either high-risk non-homogenous variants or homogenous white plaques. Histopathological evaluation, bolstered by supplementary techniques like autofluorescence and toluidine blue staining, is the basis for diagnostic evaluation. Removing risk factors, treating dysplastic lesions, and maintaining long-term monitoring are the main goals of management. Improving early detection and lowering malignant transformation require ongoing advancements in biomarkers and standardized clinical procedures.

Key words: Leukoplakia, p53 abnormalities, Oxidative stress, Oral microbiome, Malignant transformation.

BRNS/RCP/25/P-95

A Review on Bioadhesive for Tissue Repair and Regeneration

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Abstract

Bioadhesive have emerged as a promising class of biomaterials for tissue repair and regeneration due to their ability to create strong, localized adhesion between biological surfaces while supporting natural healing mechanisms. Traditional wound closure techniques such as sutures and staples often cause tissue trauma, inflammation, and scarring, whereas bioadhesives offer a minimally invasive alternative with improved biocompatibility and functional outcomes. This review provides a comprehensive overview of the types, mechanisms, applications, and future prospects of bioadhesives in biomedical science. Bioadhesive derived from natural polymers such as chitosan, gelatin, fibrin, collagen, and alginate demonstrate excellent biocompatibility, biodegradability, and intrinsic biological activity, making them ideal for soft tissue repair. Synthetic bioadhesives, including cyanoacrylates, polyethylene glycol (PEG)–based hydrogels, and nanocomposite sealants, offer tunable mechanical strength, rapid gelation, and controlled degradation. The review also highlights the advancements in smart bioadhesives, which incorporate stimuli-responsive materials, antimicrobial agents, and growth factors to enhance regenerative outcomes. Overall, bioadhesive represent a versatile and rapidly evolving platform that holds significant promise for next-generation tissue engineering and regenerative therapies. Continued research and development are essential to optimize their performance, safety, and clinical applicability.

Key words: Bioadhesive, Regeneration, Would Healing, Skin biocompatibility, Tissue engineering

BRNS/RCP/25/P-96

Formulation and Characterization of Photoprotective Herbal Cream

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Abstract

The increasing incidence of skin disorders caused by excessive ultraviolet (UV) radiation has intensified the demand for safe and effective photoprotective skincare formulations. Herbal ingredients, known for their antioxidant richness and minimal adverse effects, offer a promising natural alternative to synthetic sunscreens. The present study focuses on the formulation and characterization of a photoprotective herbal cream incorporating selected plant extracts with proven UV-absorbing and free-radical-scavenging properties. Herbal actives such as Aloe vera, Curcuma longa, Azadirachta indica, and Camellia sinensis were incorporated into an oil-in-water (O/W) emulsion base, prepared using standard fusion and homogenization techniques. The formulated cream was evaluated for key physicochemical parameters including pH, viscosity, spreadability, homogeneity, and stability under accelerated storage conditions. Results demonstrated that the herbal cream exhibited desirable organoleptic and stability characteristics, with a pH compatible with skin physiology and optimal spreadability for topical application. The formulation showed significant absorbance in the UV-B region and a promising SPF value, indicating effective photoprotection. Overall, the study highlights the potential of herbal ingredients in developing a safe, effective, and eco-friendly photoprotective cream suitable for routine skincare applications. The findings support the growing interest in natural cosmetic formulations and provide a foundation for future clinical evaluation.

Keywords: Herbal Cream, Bioactive extract, Photoprotective, UV Radiation, Sun Protection Factor

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Formulation and Evaluation of Natural Based Hand Sanitizer Enhanced Antimicrobial Efficacy

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Abstract

The rising incidence of microbial infections and the increasing demand for safe, effective, and eco-friendly hand hygiene products has accelerated interest in herbal alternatives to conventional alcohol-based sanitizers, though effective, are often associated with skin dryness, irritation, and potential toxicity on prolonged use. The present study focuses on the preparation and characterization of a Polyherbal hand sanitizer gel formulated using extracts of Aloe vera(Ghritkumari), Neem (Azadirachta indica), Tulsi (Ocimum sanctum), and Lemon (Citrus lemon). These herbs are traditionally recognized for their antimicrobial, antiviral, antioxidant, and skin-soothing properties. The gel was prepared using carbopol-based gelling agents and optimized for consistency and stability enriched with plant-derived bioactive extracts aimed at enhancing antimicrobial efficacy while maintaining dermatological safety. The formulated product was evaluated through organoleptic studies, pH , viscosity , spreadability, wash ability, and stability testing under different storage conditions. Antimicrobial activity was assessed against common skin-borne pathogens including E. coli, S. aureus, and P. aeruginosa. The results demonstrated that the Polyherbal gel exhibited desirable physicochemical characteristics, good antimicrobial efficacy, and excellent skin compatibility. The study concludes that the developed Polyherbal hand sanitizer gel can serve as a promising natural alternative to synthetic formulations, offering effective hand hygiene with no side effects.

Keywords: Plant extract, Alcohol, Herbal Hand Sanitizer, Antimicrobial, Physical Stability

BRNS/RCP/25/P-98

A Review on the Pharmacological and Medicinal Importance of Acmella (Acmella Oleracea)

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Abstract

Acmella (*Acmella oleracea*), commonly known as the Toothache Plant or Spilanthol, is a medicinal herb widely recognized for its therapeutic properties. The plant contains a rich profile of bioactive compounds, among which Spilanthol is the most predominant and pharmacologically active. Traditionally, Acmella has been used to relieve toothache, treat skin infections, reduce inflammation, promote wound healing, and enhance immunity. This review summarizes current scientific knowledge on the plant's phytochemistry, medicinal uses, and pharmacological activities. Literature from published research articles, pharmacognosy textbooks, and online scientific databases was analyzed. Spilanthol is the major alkamide present in this plant, responsible for its unique sensory effects. Multidisciplinary studies on A. Oleracea herb have made remarkable progress, and several commercial products have been developed over the years. However, its application in the food industry remains limited, creating opportunities for further research. Findings indicate that Acmella exhibits significant analgesic, anti-inflammatory, antimicrobial, antifungal, antioxidant, immunomodulatory, and wound-healingeffects. These activities are associated with its alkylamides, flavonoids, terpenoids, and essential oils. Acmella is increasingly incorporated into herbal formulations for oral health, dermatological preparations, and cosmetic products due to its skin-firming and anti-aging properties. The plant demonstrates strong potential for developing natural therapeutic agents and nutraceutical products. However, more advanced clinical studies are required to validate its medicinal claims and optimize its therapeutic applications.

Keywords: Acmella oleracea, Toothache Plant, Spilanthol, Medicinal Plants, Anti-inflammatory, Analgesic,

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Formulation and Evaluation on Ocular In-Situ Gel Using Cefixime

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ABSTRACT

The present study was undertaken to formulate and evaluate an ocular in situ gelling system of Cefixime, a third-generation cephalosporin antibiotic, aimed at improving ocular bioavailability and prolonging drug retention time. Conventional ophthalmic preparations, such as eye drops, suffer from rapid precorneal drainage and poor therapeutic efficacy. To overcome these drawbacks, in situ gels that undergo sol-to-gel transition in response to ocular physiological stimuli were developed. The formulations were prepared using Carbopol 940 (pH-sensitive polymer) and Sodium Alginate (ion-activated polymer) in combination with Hydroxypropyl Methylcellulose (HPMC) as a viscosity modifier. The prepared formulations were evaluated for clarity, pH, viscosity, gelling capacity, drug content uniformity, in vitro drug release, antimicrobial activity, and sterility. The optimized formulation exhibited rapid gelation in simulated tear fluid, acceptable viscosity, and sustained drug release for an extended period, and significant antibacterial activity against ocular pathogens. The results indicate that the developed Cefixime ocular in situ gel offers a promising, sustained, and patient-compliant drug delivery system for the effective management of ocular infections.

Keywords: Cefixime, Ocular drug delivery, In-situ gel, Carbopol 940, Sodium alginate, HPMC, Sustained release, Antimicrobial activity

BRNS/RCP/25/P-100

Standardization and Quality Assessment of Herbal Drugs Produced by Laghu Udyog in Chhattisgarh

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Abstract

The study evaluates uniformity and efficacy standards for herbal medicines manufactured at Laghu Udyog in Chhattisgarh. Context: Chhattisgarh Possessed abundant natural herbs; however, its smaller enterprises frequently employ unregulated processes, resulting in inconsistent product standards. Assuring the integrity and cleanliness of natural remedies ensures public safety and meets legal standards. Objective is to scrutinize specific herbal preparations found in Laghu Udyog; these will be evaluated for purity using established physical-chemical tests alongside chromatography techniques. Samples of herbs underwent evaluation through standard pharmaceutical criteria such as assessing their ash levels, extraction properties, water content, and acidity measurements. A preliminary examination of plant chemical components was conducted through chromatographic techniques for compound identification. Samples underwent microbial count, heavy metals assessment, and impurity examination according to World Health Organization Ayurvedic standards revealed substantial differences in physical-chemical properties among producers. The TLC/HPHTLC analysis indicated the detection of crucial plant compounds; however, it highlighted variability among the intensities of specific markers. Certain test results showed contamination above safe levels of microorganisms and humidity, suggesting deficiencies in handling procedures and preservation methods. The research underscores the imperative necessity of uniform production standards and rigorous inspection procedures within small-scale industries across Chhattisgarh. Implementing WHO-GMP standards along with regular chromatography analysis enhances product purity and security substantially. Standardizing herbal drugs for quality assessment in Laghu udyog units of Chhattisgarh using high performance thin layer chromatography techniques is crucial.

Key words: Herbal drugs, Standardization, Chromatography, Chhattisgarh, Quality assessment

BRNS/RCP/25/P-101

Fabrication and Characterization of Novel Natural Bioactive Medicine for Treatment of Alzheimer Disease

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Abstract

Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by cognitive decline, memory impairment, and neuronal dysfunction. Despite the availability of several synthetic therapeutic agents, their clinical efficacy remains limited and often associated with adverse effects, highlighting the need for safer and more effective alternatives. The present study focuses on the fabrication and characterization of a novel natural bioactive medicine formulated from selected phytoconstituents known for their neuroprotective, antioxidant, and anti-inflammatory properties. The bioactive extract was fabricated using optimized extraction and formulation techniques to enhance stability, bioavailability, and targeted delivery to neuronal tissues. Comprehensive phytochemical screening FTIR, UV–Vis, and HPLC profiling were performed to confirm the presence and purity of major therapeutic constituents. Additionally, the formulation was evaluated for antioxidant capacity, acetylcholinesterase inhibition, and anti-amyloidogenic potential, which serve as key pharmacological markers for AD management. Preliminary in-vitro assessments demonstrated significant neuroprotective effects, suggesting its potential as a complementary therapeutic approach. This study provides a foundation for the development of safe, natural, and effective bioactive medicine for Alzheimer's disease, warranting further in-vivo and clinical investigations.

Key words: Bioactive extract, phytochemical screening, Alzheimer disease, Natural Medicine, Physical Stability

BRNS/RCP/25/P-102

Evaluation of Anti-inflammatory Effect of Moringa Oleifera Leaves on Experimental Rats

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Abstract

Inflammation is a key physiological response to injury and infection, yet its chronic persistence contributes to the pathogenesis of various disorders. Moringa oleifera, a widely used medicinal plant, possesses phytoconstituents such as flavonoids, tannins, and phenolic compounds known for potential anti-inflammatory activity. The present study aims to evaluate the anti-inflammatory effect of Moringa oleifera leaf extracts using an experimentally induced inflammation model in rats. Hydro alcoholic leaf extract was prepared and administered at different dose levels to compare its efficacy with standard anti-inflammatory drugs. The anti-inflammatory effect was assessed using paw edema inhibition, percentage reduction in swelling, and behavioral changes in treated groups. Results demonstrated that Moringa oleifera extract significantly reduced paw edema in a dose-dependent manner, suggesting strong anti-inflammatory activity. The observed effect is attributed to the synergistic action of bioactive phytochemicals present in the leaves. The study concludes that Moringa oleifera leaves exhibit promising anti-inflammatory potential and may serve as a natural alternative for managing inflammatory conditions, supporting its traditional medicinal use.

Key words: Bioactive extract, phytochemical screening, Anti-inflammatory activity, Moringa oleifera

BRNS/RCP/25/P-103

A Review on Natural Herbal Shampoo

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Abstract

Herbal shampoos have gained significant global attention as safe, effective, and eco-friendly alternatives to conventional synthetic hair-cleansing formulations. Herbal shampoos incorporate plant-derived ingredients such as Aloe vera, Sapindus mukoross (Reetha), Acacia concinna (Shikakai), Hibiscus rosa-sinensis, Azadirachta indica (Neem), and various essential oils, which collectively contribute to cleansing, conditioning, antimicrobial, antioxidant, and hair-strengthening properties. Unlike synthetic shampoos containing harsh surfactants like SLS and SLES, herbal formulations emphasize mild natural surfactants, bioactive phytochemicals, and biodegradable excipients that minimize scalp irritation and long-term damage. This review highlights the pharmacognostic characteristics and functional roles of commonly used herbal ingredients, including natural saponins, flavonoids, tannins, mucilage, and essential oils, which help improve scalp health, reduce dandruff, prevent hair fall, and enhance hair texture. Additionally, the paper discusses various formulation strategies, including preparation methods, optimization of viscosity, foaming ability, pH adjustment, stability considerations, and the role of natural preservatives. Evaluation techniques such as physicochemical analysis, sensory assessment, foam stability, wetting time, surface tension, solid content, and antimicrobial efficacy testing are also examined to determine the quality and performance of herbal shampoos. Overall, the review concludes that natural herbal shampoos present a promising, sustainable approach to hair care due to their safety profile, therapeutic potential, and consumer acceptability. However, further research, standardization of herbal extracts, and clinical validation are required to ensure quality consistency and commercial viability in large-scale production.

Key words: Plant extract, Anti-dandruff, Herbal Shampoo, Scalp health, Antimicrobial, Physical Stability

BRNS/RCP/25/P-104

Formulation and Evaluation of Herbal Face Gel Using Aloevera, Hibiscus, Azadirachita Indica and Tagetes Extract

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Abstract

The present study focuses on the formulation and evaluation of a Polyherbal face gel incorporating extracts of Aloe vera, Hibiscus rosa-sinensis, Azadirachta indica (Neem), and Tagetes erecta (Marigold). These medicinal plants are well-known for their complementary skin benefits, including moisturizing, anti-inflammatory, antioxidant, antimicrobial, and complexion-enhancing properties. Hydro alcoholic extracts of the selected herbs were prepared and incorporated into a carbopol-based gel base to obtain a stable topical formulation. The formulated gel was evaluated for organoleptic properties, pH, viscosity, spreadability, washability, homogeneity, stability, and microbial load. Results revealed that the polyherbal gel possessed an appealing appearance, optimal pH suitable for skin application, satisfactory viscosity and spreadability, and good stability under accelerated conditions. The antimicrobial activity of Neem and Marigold extracts contributed to reduced microbial growth, while Aloe vera and Hibiscus enhanced hydration and skin nourishment. Overall, the study demonstrates that the Polyherbal face gel prepared from Aloe vera, Hibiscus, Azadirachta indica, and Tagetes erecta extracts is safe, stable, and effective for topical use and holds potential as a natural cosmetic formulation for skin care.

Key words: Plant extract, Carbopol 940, Polyherbal face gel, Skin Nourishment Antimicrobial, Physical Stability

BRNS/RCP/25/P-105

A Review on Anti-Tubercular Agent

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Abstract

Tuberculosis (TB) remains one of the most persistent global health challenges, affecting millions of individuals each year and leading to significant morbidity and mortality, particularly in developing nations. The causative pathogen Mycobacterium tuberculosis exhibits a uniquely complex cell wall and slow growth rate, making treatment difficult and prolonged. This review provides a comprehensive analysis of existing anti-tubercular agents, their mechanisms of action, therapeutic significance, and emerging research trends. First-line anti-tubercular drugs, including isoniazid, rifampicin, pyrazinamide, ethambutol, and streptomycin. Their pharmacological mechanisms range from inhibition of mycolic acid synthesis to interference with RNA polymerase, collectively targeting multiple pathways essential for bacterial survival. However, the rise of multidrug-resistant (MDR-TB), extensively drug-resistant (XDR-TB), and totally drug-resistant (TDR-TB) strains has necessitated the development of novel therapeutic options. Second-line agents such as fluoroquinolones, aminoglycosides, linezolid, and clofazimine are often required, although they pose challenges related to toxicity, cost, and extended treatment durations. Recent advancements have introduced newer agents like bedaquiline, and pretomanid, which act on previously unexploited biochemical pathways, offering hope for more efficient and shorter treatment regimens. Additionally, natural products, host-directed therapies, and nanotechnology-based drug delivery systems are being explored to enhance efficacy and reduce adverse effects. Despite these advancements, early diagnosis, drug resistance management, and patient adherence remain crucial barriers to TB elimination. This review highlights the need for continuous research to develop safer, more potent, and resistance-proof anti-tubercular agents that can address the evolving challenges of tuberculosis control.

Key words: Anti-tubercular, Mycobacterium Tuberculosis, Multidrug-resistant, Antibiotic

BRNS/RCP/25/P-106

A Review on Herbal Drug Used in Aging

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Abstract

Aging is a complex, multifactorial biological process characterized by gradual physiological decline, increased oxidative stress, reduced cellular regeneration, and heightened susceptibility to chronic diseases. With a growing global elderly population, there is increasing scientific interest in natural and plant-based interventions that can delay aging, enhance longevity, and improve quality of life. Herbal drugs, rich in bioactive phytoconstituents such as flavonoids, polyphenols, carotenoids, alkaloids, and terpenoids, have shown remarkable antioxidant, anti-inflammatory, and anti-senescent properties, making them promising candidates for anti-aging therapy. This review highlights the major herbal plants used traditionally and scientifically for aging-related conditions, including Withania somnifera (Ashwagandha), Curcuma longa (Turmeric), Panax ginseng (Ginseng), Moringa oleifera, Ginkgo biloba, Emblica officinalis (Amla), and Aloe vera. These herbs exert anti-aging effects primarily by neutralizing free radicals, preventing collagen degradation, modulating inflammatory pathways, enhancing mitochondrial function, and promoting DNA repair mechanisms. Several clinical and preclinical studies have demonstrated that herbal extracts can improve cognition, reduce oxidative biomarkers, maintain skin elasticity, regulate immune responses, and support cardiovascular and metabolic health during the aging process. Furthermore, the use of herbal drugs is considered safer, affordable, and more accessible compared to synthetic anti-aging agents, with fewer reported side effects. This review concludes that herbal drugs offer significant potential in managing aging and age-associated disorders. Strengthening scientific evidence will enable the integration of herbal anti-aging therapeutics into mainstream healthcare and preventive geriatric medicine.

Key words: Plant extract, Herbal Anti-ageing, Longivity , Skin Nourishment, Natural drug, Physical Stability

BRNS/RCP/25/P-107

The stages of Drug Discovery and Development Process

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Abstract

Drug discovery is a process which aims at identifying a compound therapeutically useful in curing and treating disease. This process involves the identification of candidates, synthesis, characterization, validation, optimization, screening and assays for therapeutic efficacy. Once a compound has shown its significance in these investigations, it will initiate the process of drug development earlier to clinical trials. New drug development process must continue through several stages in order to make a medicine that is safe, effective, and has approved all regulatory requirements. One overall theme of our article is that the process is sufficiently long, complex, and expensive so that many biological targets must be considered for every new medicine ultimately approved for clinical use and new research tools may be needed to investigate each new target. From initial discovery to a marketable medicine is a long, challenging task. It takes about 12 - 15 years from discovery to the approved medicine and requires an investment of about US $1 billion. On an average, a million molecules screened but only a single is explored in late stage clinical trials and is finally made obtainable for patients. This article provides a brief outline of the processes of new drug discovery and development.

Keywords: development, clinical, screening, therapeutic efficacy

BRNS/RCP/25/P-108

Preparation, Characterization and Evaluation of Phytosome of Turmeric oil for Topical Application

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Abstract

In this study, we developed a nanoparticle based turmeric oil-phytosome drug delivery system (TOH) by combining of turmeric oil and soya lecithin to target the topical route. Turmeric oil exhibits poor oral absorption due to its limited aqueous solubility and extensive presystemic metabolism. To overcome these issues, phytosome drug delivery system was designed to improve the bioavailability and prolong the retention time of turmeric oil in the body. The TOH were prepared by utilizing of different molar ratio of 1:1, 1:2, 2:1 and 2:2 of turmeric oil and soya lecithin using anti-solvent precipitation technique. The optimized phytosome was crystalline and irregular shapes, with a mean particle size of 150.76 ± 0.03 nm (-8.79 mV) and 92.05 ± 0.00 % entrapment efficiency. Differential scanning calorimetry and Fourier transform infrared spectroscopy confirmed the compatibility and the integrity of phytosome. The *in vitro* anti-microbial study was shown the significant ($P < 0.05$) inhibition against producible infections (*B. subtilis;* NCIM 2920 and *E. coli;* NCIM 2065). *In vitro* permeation study of topical gel of phytosome of turmeric oil through cellulose acetate membrane showed significant ($p < 0.05$) sustained release (93.09 ± 0.05 %) of turmeric oil up to 12 h compared to turmeric oil gel (74.04 ± 0.08 %).These results demonstrated that phytosome of turmeric oil has potential topical application as it can scavenge the free radicals and produce significant anti-inflammatory and anti-bacterial activities to treat skin diseases.

Keywords: Phytosome; Tumeric oil; Soya lecithin; *In vitro* studies; Topical gel.

BRNS/RCP/25/P-109

Recent Advances in Nanotechnology for Parkinson's Disease: Diagnosis, Treatment

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Abstract

Nanomedicine has emerged as a promising field offering new hope in the treatment of PD. Nanomedicine involves using nanotechnology to create nanoscale materials, such as nanoparticles and nanocarriers, to improve drug delivery systems. These nanoscale materials can cross the blood–brain barrier more effectively. Several studies have suggested that epigenetic and pathogenic mechanisms such as proteasome and lysosomal dysfunction, mitochondrial failure, oxidative stress, and neuroinflammation (astrocyte and microglial impairment) must underlie the onset of the disease. As depicted in, all these associated pathogenic events result in dopamine depletion, brain homeostasis disruption, synaptic dysfunction, and eventually, neuronal cell death. Age, environmental factors, genetic factors, and lifestyle habits are all potential risk factors for the development of PD. The failure of these regulatory processes allowed misfolded proteins like α–syn to accumulate, resulting in the formation of Lewy bodies. Several drug treatments are currently available for the management of PD patients. The most prevalent treatment for PD is pharmacotherapy, which is a pharmacological drug treatment strategy. This innovative encapsulated drug delivery method significantly improved target-site delivery and enhanced the half-life of the drug. Immunotherapy, gene therapy, surgical therapy, and behavioral therapy are some of the additional therapeutic interventions for PD. Deep brain stimulation, which proved to be a gold-standard treatment for some advanced stage PD patients, involve the surgical implantation of electrodes. Thalamic stimulation, pedunculopontine nucleus stimulation, and pallidal stimulation are examples of deep brain stimulation. Current PD treatments aim at symptom reduction through oral delivery of levodopa (L-DOPA), a precursor of DA.

Keywords: Parkinson's disease; nanomedicine; drug delivery systems; neurodegeneration; blood–brain barrier.

BRNS/RCP/25/P-110

Formulation and Evaluation of Niosome Based Gel of Isotretinoin

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Abstract

Isotretinoin is a retinoids derivative, it is primarily used in dermatology in the treatment of Acne, it is usually employed as a cream, gel, lotion or ointment. Retinoids have many important functions throughout the body including roles in vision, regulation of cell proliferation and differentiation, growth of bone tissue, immune function, and activation of tumor suppressor genes. The main objective of this study is the formulation of niosome based gel of isotretinoin for topical drug delivery to increase retention time in the dermis layer through controlled release of drug. Niosome with drug prolong the duration of action and prevent its side effects. Niosome was prepared by hand shaking method by altering the ratio between non-ionic surfactant span (60) and cholesterol. The niosome dispersion was evaluated for FTIR, vesicle size, percent of entrapment efficiency, In- Vitro drug release, stability studied at different temperature. The present study demonstrates that the optimized formulation NBG3 can be good can candidate for prolongation of drug release into skin and improved permeation across the skin after encapsulation of Isotretinoin into niosome. The developed Niosome Based gel formulations were able to achieve prolonged drug release in-vitro.

Keywords: Niosomes, isotretinoin, span 60, cholesterol, acne treatment, skin permeation, in- vitro drug release, controlled release, entrapment effiency.

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Drug Discovery

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Abstract

Drug discovery is a high-risk, high-reward business that requires a multidisciplinary approach. Behind every successful drug, there are usually identifiable champions who have been prepared to stand by the drug through the tortuous route. The easiest decision at every stage of drug discovery is to kill the project, and there are usually reasons to consider doing so. Keen scientific judgment is required. The key elements are scientific and clinical insight, tenacity and passion, and at each stage, an understanding of experimental approach to answer defined questions. The optimal unit for drug discovery integrates the science of the various functions including chemistry, biology, clinical science, and toxicology.

Keywords: drug discovery, multidisciplinary, tortuous route, key element, clinical insight, chemical, biology, clinical science and toxicology

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"Ethics of AI:
Challenges and Governance of Artificial Intelligence in Radiopharmaceutical Research"

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Herbal Remedies for Vitiligo: Investigating Mechanisms of Action, AntioxidantProperties, and Integrative Approaches for Enhanced Efficacy

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Abstract

Vitiligo is a long-term skin condition marked by depigmented patches caused by a steady loss of melanocytes. Vitiligo is caused by a complex interaction of environmental, immunological, and genetic factors. Alternative therapeutic options, especially herbal medicines, are being investigated because conventional medications like corticosteroids and phototherapy are frequently linked to limited efficacy and negative effects. The purpose of this review is to investigate the therapeutic potential, antioxidant qualities, and modes of action of herbal medicines for the treatment of vitiligo. To find studies on herbal treatments for vitiligo, a systematic review of the literature was carried out utilizing electronic databases such as PubMed, Scopus, and Google Scholar. Included were studies that examined the effectiveness, modes of action, and clinical uses of herbal remedies that were published between 2000 and 2023.Through processes like melanogenesis promotion, immunological modulation, and antioxidant activity, certain herbs, including Psoralea corylifolia (Bakuchi), Glycyrrhiza glabra (licorice), Phyllanthus emblica (Amla), and Centella asiatica, have shown notable advantages in the treatment of vitiligo. Bioactive substances included in these herbs, such as psoralen, glycyrrhizin, and polyphenols, have been demonstrated to enhance melanocyte regeneration, lessen oxidative stress, and alter immunological responses. Herbal medicines offer therapeutic benefits with fewer side effects, making them a promising addition to or substitute for traditional vitiligo treatments.. The management of vitiligo may be improved by combining herbal therapy with traditional treatments and making lifestyle changes.

Keywords -Vitiligo, Herbal remedies, Psoralea corylifolia, Glycyrrhiza glabra

BRNS/RCP/25/P-113

Antibiotic Resistance: A Growing Health Threat

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Abstract

Antibiotic resistance has emerged as one of the most critical global health challenges of our time. It occurs when bacteria evolve mechanisms to survive exposure to antibiotics, making common infections harder to treat. Factors such as the overuse and misuse of antibiotics in humans and animals, incomplete treatment courses, and poor infection control practices accelerate this problem. As a result, previously treatable illnesses like pneumonia, tuberculosis, and urinary tract infections are becoming increasingly difficult to cure. The consequences are serious: longer illnesses, higher medical costs, increased hospital admissions, and a rise in mortality rates. Drug-resistant infections also threaten major medical procedures such as surgeries, organ transplants, and chemotherapy, which rely heavily on effective antibiotics for infection prevention. Prevention requires collective action. Individuals can help by taking antibiotics only when prescribed, completing the full course, and avoiding self-medication. Healthcare providers must ensure responsible prescribing, maintain hygiene standards, and educate patients. Governments and global health organizations like WHO emphasize surveillance, research, and the development of new antibiotics. Antibiotic resistance is preventable if everyone—patients, doctors, farmers, and policymakers—acts responsibly. Immediate steps taken today can safeguard the effectiveness of antibiotics for future generations.

Keywords: Prevention, pneumonia, tuberculosis, infections

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Artificial Intelligence in Pharmacy

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Abstract

Artificial intelligence (AI) is rapidly transforming the pharmaceutical and healthcare sectors by enhancing accuracy, efficiency, and decision-making. AI technologies such as machine learning, deep learning, and natural language processing are being used across multiple stages of pharmacy practice—from drug discovery and formulation to clinical decision support and patient monitoring. In drug discovery, - AI helps analyze large datasets, predict drug–target interactions, and identify promising molecules much faster than traditional methods. This reduces research time and cost. AI-based algorithms also support pharmacovigilance by automatically detecting adverse drug reactions from medical records, social media, and clinical reports, improving drug safety monitoring. In clinical settings - AI assists pharmacists with medication therapy management by predicting drug interactions, optimizing dosages, and identifying high-risk patients. AI-powered tools enhance accuracy in dispensing, reduce errors, and support personalized medicine by analyzing genetic, clinical, and lifestyle data.AI-driven chatbots and virtual assistants improve patient counselling by providing reminders, medication guidance, and health education. In pharmaceutical manufacturing, AI ensures quality control, process automation, and predictive maintenance of equipment. Overall, AI is reshaping pharmacy by making processes faster, safer, and more accurate. As technology continues to evolve, AI will play an increasingly crucial role in advancing pharmaceutical research and improving patient outcomes.

Keywords: Artificial intelligence in pharmacy and its management,drug safety,role of AI.

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A Review On: Phytochemistry, Pharmacological Activities and Therapeutic Uses of Phyllanthus emblica (Indian Gooseberry/Amla) along with their Mechanism of Action as Anticancer Activities

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Abstract

Phytlanthus emblica L, (Indian gooseberry or Amla) is a well-known medicinal plant with high therapeutic and nutritional value, The plant is rich in tannins, flavonoids, alkaloids, phenolic acids, and ascorbic acid, which are responsible for its strong antioxidant activity. Prominent constituents like emblieanin A and B, gallic acid, and ellagic acid validate its antioxidant activity against oxidative stress and control over metabolic processes. Pharmacological studies show that it is effective against inflammation, hyperglycemia, cancer cell growth, hepatic injury, and microbial infections. Anti-diabetic action is due to its effect on glucose metabolism and the vascular system, whereas anticancer efficacy is due to inhibition of tumorigenic transcription factors and cell growth. P, emblica further influences immune functions, improves liver function, and gives relief from the gastrointestinal system through laxative and antidiarrheal activities, Evidence also shows its radio-protective and antimutagenic effects. Such effects are verified through in vivo and in vitro tests, though more studies are needed to determine the exact mechanisms and active compounds. A Ithough it has a vast traditional history of use and encouraging bioactivities, the clinical utility of P. emblica is currently restricted owing to a lack of standardization and controlled human trials. This review discusses its taxonomic classification, dense phytochemical content, and varied pharmacological activities, also underscoring the imperative need for more advanced research in terms of isolation of compounds, studies on molecular interactions, and clinical validation to unleash its fulltherapeutic potential. P. emblica may be an important contender for evidencebased inclusion into contemporary harmacotherapy.

Keywords: Anticancer, Antioxidants, Gallic acid, Ascorbic acid, Ellagic acid, Emblicanin

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From Fats and Oils to Lipid Nanocarriers the Future of Organic Chemistry

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Abstract

This presentation explains how fats and oils have evolved from dietary components to advanced lipid nanocarriers used in modern drug delivery. It covers the chemistry of fats and oils, including hydrolysis, saponification, hydrogenation, and rancidity, along with analytical constants like acid, saponification, ester, and iodine values. It highlights how these reactions determine purity, stability, and industrial applications. The presentation also introduces SLNs and liposomes, which play a crucial role in targeted drug delivery and pharmaceutical formulations, showing the growing importance of lipids in advanced medicine.

Keywords: purity, stability, nanocarriers, medicine

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Artificial Intelligence in Pharmacy

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Abstract

Artificial intelligence is reshaping the pharmaceutical and healthcare fields by improving accuracy, efficiency, and decision making. Technologies such as machine learning, deep learning, and natural language processing are now used throughout pharmacy practice, including drug discovery, formulation, clinical decision support, and patient monitoring. In drug discovery, AI helps screen large data sets, predict drug–target interactions, and identify promising molecules much faster than conventional approaches, which reduces both time and cost. AI also supports pharmacovigilance by automatically detecting adverse drug reactions from medical records, social media, and clinical reports to improve drug safety. In clinical settings, AI assists pharmacists in medication therapy management by predicting drug interactions, optimizing dosage, and identifying high-risk patients. AI tools increase accuracy in dispensing, minimize medication errors, and support personalized medicine by analyzing genetic, clinical, and lifestyle information. Chatbots and virtual assistants further improve patient counseling by offering reminders, medication guidance, and health education. In pharmaceutical manufacturing, AI supports quality control, process automation, and predictive maintenance of equipment. Overall, AI is making pharmacy practices faster, safer, and more reliable. As technology continues to advance, AI will play a growing role in pharmaceutical research and patient care.

Keywords: Artificial intelligence, pharmacy, drug discovery, pharmacovigilance, personalized medicine, clinical decision support, pharmaceutical manufacturing.

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Novel RP-HPLC Method Development and Validation for Estimation of Remogliflozin Etabonate and Vildagliptin in Bulk and Tablet Dosage form by Using Internal Standard Method.

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Abstract

Remogliflozin, a selective sodium-glucose co-transporter subtype 2 (SGLT2) inhibitor, which is to be administered as remogliflozin etabonate (Remo™, Remozen™), this drug is recently approved for treatment of type 2 diabetes mellitus (T2DM) in India. Novel RP-HPLC method was developed for method development and validation of Remogliflozin Etabonate and Vildagliptin in bulk and tablet dosage form. The chromatographic separation was carried out for present study Luna Phenyl Hexyl (250x 4.6mm, 5µ) column was used for separation & detection was made at 225 nm by photodiode detector. Quantitation was done by internal standard HPLC method and run time required was less than 10 min. The proposed method was validated as per ICH guidelines for its accuracy, precision, robustness, ruggedness, linearity, limit of detection, limit of quantitation and was found to be in range RSD < 2.0 and SD < ± 2.0). The marketed formulation Remo-v was analyzed by the developed method. The % assay was found to be satisfactory.

Keywords: Remogliflozin, Vildagliptin, HPLC, method development, internal standard method.

BRNS/RCP/25/P-119

Importance of Biotechnology

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Abstract

Biotechnology plays a pivotal role in advancing modern pharmacy by integrating biological sciences with technological innovation to improve drug discovery, development, and therapeutic outcomes. Its importance is evident across multiple pharmaceutical domains, including the production of biopharmaceuticals, personalized medicine, vaccine development, and improved drug delivery systems. Through genetic engineering, recombinant DNA technology, and cell-based research, biotechnology enables the creation of safer and more effective medications, such as monoclonal antibodies, therapeutic proteins, and gene-based therapies that target diseases at their molecular roots. In pharmaceutical research, biotechnology accelerates the identification of novel drug targets and streamlines preclinical testing through tools like bioinformatics, proteomics, and high-throughput screening. These technologies enhance precision and reduce the time and cost associated with bringing new drugs to market. Additionally, biotechnological methods contribute to the large-scale manufacture of therapeutic compounds using microbial, mammalian, or plant-based expression systems, ensuring high purity, consistency, and sustainability. Biotechnology also supports the growing field of personalized medicine by enabling the development of patient-specific treatment strategies. Pharmacogenomics—an intersection of genetics and pharmacology—helps predict individual responses to drugs, improving efficacy and minimizing adverse effects. Moreover, biotechnological innovations in nanotechnology and advanced drug delivery systems enhance the bioavailability, targeting, and controlled release of medications.

Keywords: Biotechnology; Pharmaceutical sciences; Drug discovery; Biopharmaceuticals

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Review on Nanotechnology Applications and Advancement in Herbal Medicine

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Abstract

This review explores the intersection of nanotechnology and herbal medicine, focusing on recent advancement and applications. Nanotechnology, with its ability to manipulate materials at the molecular levels, has opened new avenues for enhancing the efficacy, stability, and delivery of herbal compounds. This review highlights the innovative techniques employed in the nanoencapsulation of active herbal ingredients, which improves their bioavailability understanding of how nanotechnology is transforming herbal medicine and its potential for future research and clinical applications.

Keywords- Nanotechnology, herbal, bioavailability.

BRNS/RCP/25/P-121

Biogenic Synthesis of Copper Oxide Nanoparticles Using Macaranga Indica Leaf Extract and their Cytotoxic and Apoptotic Effects against Carcinoma Cell Lines.

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Abstract

Herein copper oxide nanoparticles (CuONPs) were synthesized by a green method using aqueous leaf extracts of *Macaranga Indica*. The phytochemical estimation of the leaf extract confirmed the existence of flavonoids, phenols, and alkaloids, which facilitate the materialization of CuONPs. The synthesized CuONPs were characterized using UV-visible spectrophotometry, FT-IR, XRD, SEM, and EDX analysis. XRD pattern confirmed the single-phase monoclinic structure of the CuONPs with an average crystallite size of approximately 25 nm. FESEM showed that the CuONPs had a spherical morphology with an average size ranging from 25 to 30 nm. The cytotoxicity of the CuONPs was evaluated against human lung carcinoma cells (A-549), human breast cancer cells (MCF-7), and human liver cancer cells (HepG-2). The half-maximal inhibitory concentration (IC_{50}) values were determined to be 281 µg/mL, 795 µg/mL, and 1022 µg/mL for A-549, MCF-7, and HepG-2 cell lines, respectively. These findings indicate that the CuONPs exhibit promising cytotoxic effects, particularly against A-549 and MCF-7 cell lines. Additionally, the CuO nanoparticles showed an apoptotic effect of 11.10% against A-549 cells at the IC_{50} concentration. The study concludes that the synthesized CuONPs possess antiproliferative properties against the A-549 cell line, primarily by inducing apoptosis.

Keywords: Copper oxide nanoparticles, Macaranga indica, XRD, FESEM, cytotoxic and apoptotic effects.

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Artificial Inteligence

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Abstract

Artificial Intelligence (AI) represents one of the most transformative forces in modern society, shaping industries, enhancing productivity, and redefining human-machine interaction. By mimicking cognitive functions such as learning, reasoning, and problem-solving, AI has made significant strides in various sectors, from healthcare to finance, entertainment, and manufacturing. Machine learning (ML), a core subfield of AI, empowers systems to learn from data and improve over time without explicit programming, thus providing more personalized and efficient outcomes. Deep learning, a subset of ML, further advances AI by using artificial neural networks to process vast amounts of unstructured data, including images, text, and audio, enabling automation and complex decision-making processes. Despite its promises, the rapid growth of AI raises ethical and societal concerns, such as job displacement, data privacy, and algorithmic bias. There is growing debate on how to balance the benefits of AI with the potential risks it introduces. Moreover, AI's reliance on large datasets and computational power raises questions about sustainability and the environmental impact of its development. As AI continues to evolve, it holds the potential to address global challenges, including climate change, healthcare disparities, and educational inequities. However, it also demands rigorous regulation, transparent practices, and international collaboration to ensure that its advancements are aligned with human values and societal needs. Future developments in AI will likely include greater autonomy, enhanced human-AI collaboration, and further integration into everyday life, making it a cornerstone of technological innovation.

Keywords: Artificial Intelligence, Machine Learning, Deep Learning, Automation, Ethics, Data Privacy, Sustainability, Human-AI Collaboration

BRNS/RCP/25/P-123

Molecular Docking and QSAR Studies on Coumarin Derivatives as DPPIV Inhibitors and Anti-Diabetic Agents: Towards Novel Approaches in Drug Discovery

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Abstract

Diabetes mellitus remains a major global health challenge, and the inhibition of dipeptidyl-peptidase IV (DPP-IV) offers a validated therapeutic strategy for improving glycemic control. In this study, a series of coumarin derivatives were investigated as novel DPP-IV inhibitors using an integrated computational approach. A virtual library of 3-, 4- and 7-substituted coumarins was constructed and docked into the active site of DPP-IV (PDB 2QT3) employing AutoDock Vina. The top-scoring compounds exhibited binding energies comparable to the reference inhibitor sitagliptin ($\Delta G \approx -9$ kcal mol^{-1}) and formed key hydrogen bonds with the catalytic Ser630 and π-π interactions with Tyr631. A robust quantitative structure-activity relationship (QSAR) model ($R^2 = 0.84$, $Q^2 = 0.79$) was developed from experimental DPP-IV IC_{50} values, highlighting that electron-withdrawing substituents at the 4-position and a flexible alkyl-triazole linker significantly enhance inhibitory potency. Molecular dynamics simulations confirmed the stability of the ligand-protein complexes over 100 ns. The most promising candidate, 7-methoxy-coumarin-triazole-isatin (compound 6c1), displayed an IC_{50} of 0.9 µM against DPP-IV and favorable ADMET properties. These findings demonstrate the utility of docking-driven design coupled with QSAR for prioritizing coumarin scaffolds as effective DPP-IV inhibitors, paving the way for further optimization and development of novel anti-diabetic agents.

Keywords: coumarin, dynamics, simulations, optimization

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Development and Characterization of Microemulsion System Containing Itraconazole

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Abstract

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

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

BRNS/RCP/25/P-125

Oxidative Stress and Antioxidant Pharmacology in Type 2 Diabetes

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Abstract

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

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

BRNS/RCP/25/P-126

Exploring the Therapeutic Potential of Blumea lacera: An Updated Review

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Abstract

Blumea lacera (Burm. f.) D.C. is a common rabi weed found throughout the plains of India. This article aims to consolidate the therapeutic information available about this species. In Ayurveda, Blumea is described as hot, pungent, bitter, and antipyretic. According to Bhaavaprakaasha, the herb is effective in treating fever, bronchial disorders, blood impurities, thirst, and burning sensations. In homoeopathy, it is prescribed for conditions such as enuresis, neuralgia, headache, cough caused by cold, and bleeding piles. Traditionally, the plant is valued for its astringent, deobstruent, and stimulant properties, and is used to manage hemorrhages, mumps, pneumonia, hepatitis, skin irritation, bronchitis, and oral inflammation. In Chhattisgarh, India, Blumea lacera is locally known as kukurmutta, kukronda, or kukkurchedi, while in other regions it is referred to as janglimuli. The local communities employ this plant for treating piles, joint pain, fever, respiratory ailments, migraine, cancerous wounds, carbuncles, and various lung diseases. Despite its remarkable ethnomedicinal significance and presence of diverse bioactive compounds, scientific studies on B. lacera remain limited. Given its extensive traditional applications and pharmacological potential, this review seeks to emphasize its phytochemical diversity, ethnomedicinal importance, and therapeutic prospects.

Keywords: Blumea lacera , Ayurveda, Homeopathic, Traditional, Pharmacological

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Emerging Therapeutic Strategies and Molecular Mechanistic Insight in the Management of Dermatophytosis

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Abstract

Dermatophytosis is a widespread superficial fungal infection affecting keratinised tissues such as skin, hair, and nails, and continues to pose significant clinical challenges due to its chronicity, recurrence, and rising antifungal resistance. Conventional therapies, while widely used, often suffer from limited efficacy, poor skin penetration, prolonged treatment courses, and incomplete eradication, emphasising the urgent need for more effective management strategies. Recent molecular investigations have unravelled critical aspects of dermatophyte biology and host–pathogen interactions. Virulence factors, including keratinases, proteases, lipases, adhesins, and biofilm formation, facilitate tissue invasion and immune evasion. Additionally, molecular pathways such as MAPK signalling, stress-response networks, and efflux pump-mediated resistance contribute to persistent infection and therapeutic failures. These mechanistic insights have opened new avenues for targeted intervention. Emerging therapeutic approaches are increasingly focused on precision and efficacy. Novel antifungal agents with enhanced pharmacokinetic profiles, virulence pathway inhibitors, natural bioactive compounds, and immunomodulatory therapies show promising antifungal activity. Furthermore, advanced drug-delivery systems, including nanotechnology-based platforms, improve dermal penetration and sustained drug release, potentially reducing recurrence and enhancing patient compliance. Complementary modalities, such as photodynamic therapy, offer non-conventional approaches for refractory cases. Integrating mechanistic understanding with innovative therapies represents a paradigm shift from conventional fungistatic treatment toward targeted, mechanism-driven management. Continued translational research combining molecular mycology, pharmacology, and advanced drug-delivery strategies is critical to overcoming current therapeutic limitations and improving clinical outcomes, ultimately reducing the global burden of dermatophytosis.

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Next-Generation Strategies in Evidence-Based Drug Discovery

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Abstract

The pharmaceutical sector continues to face severe problems. Nowadays day Evidence-based medicine is playing a vital role in medication discovery and improving health care systems. Evidence-based medicine refers to the systematic, transparent, cautious, and reasonable application of the best available contemporary research when making decisions about a patient's care. In order to give each patient, the finest medication possible, there is a drive to employ more superior clinical research. Evidence-based medicine has lately started to shift as a result of breakthroughs in ‘’wearable technology’’ data science, and machine learning. A fascinating new era of "deep" medicine has resulted from this. Clinical translations in the major domains of medicine are slipping behind, despite remarkable developments in underlying research and technology. The COVID-19 pandemic exposed structural weaknesses in the clinical trial system, but it also brought about some positive changes, such new trial designs and a shift to a more patient-centred and user-friendly evidence-generation system. Additionally, it is a self-directed, lifelong learning process where patients must acquire clinically relevant knowledge in order to meet their needs for diagnosis, prognosis, therapy, and other clinical and healthcare difficulties.

Keywords: - Evidence-based medicine (EBM), Clinical trial system, Artificial intelligence (AI), Decision making Drug development.

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Targeted Therapy Approaches In Her-2 Positive Breast Cancer

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Abstract

HER2-positive breast cancer is a clinically aggressive subtype characterised by overexpression of the Human Epidermal Growth Factor Receptor-2 (HER2) protein, which promotes uncontrolled cell proliferation, metastasis, and poor prognosis. The development of targeted therapy has significantly transformed the management and outcomes of this subtype. This abstract provides an overview of the major targeted therapeutic approaches currently used in HER2-positive breast cancer. Monoclonal antibodies such as trastuzumab and pertuzumab directly bind to extracellular domains of the HER2 receptor, inhibiting receptor activation and enhancing immune-mediated destruction of tumour cells. Antibody–drug conjugates (ADCs), including trastuzumab emtansine (T-DM1), combine targeted delivery with potent cytotoxic agents, enabling selective killing of HER2-expressing tumour cells while minimising systemic toxicity. Additionally, tyrosine kinase inhibitors (TKIs) such as lapatinib and neratinib target the intracellular kinase domain of HER2, blocking downstream signalling pathways that regulate tumour growth and survival. These therapies have demonstrated substantial clinical benefits, including improved progression-free survival, reduced recurrence rates, and enhanced overall survival, particularly when used in combination strategies. However, challenges remain, including resistance development, treatment-related toxicity, and high economic burden. Recent research continues to explore novel HER2 inhibitors, combination regimens, and biomarker-guided therapy to further optimise patient outcomes.

Keyword: HER2 inhibitors, trastuzumab, signaling, Antibody–drug conjugates

BRNS/RCP/25/P-130

In Silico Approaches of Bioactive Components in Cordyceps Militaris: A Path toward Natural Drug Discovery

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Abstract

A popular entomopathogenic fungus, has attracted attention for its broad spectrum of bioactive compounds with remarkable therapeutic potential. valued entomopathogenic fungus, has attracted attention for its broad spectrum of bioactive compounds with remarkable therapeutic potential. Natural molecules such as cordycepin, adenosine and polysaccharides exhibit antiviral, immunomodulatory and anticancer activities. adenosine, and polysaccharides exhibit antiviral, immunomodulatory, and anticancer activities. Recent advances in artificial intelligence and computational biology have transformed the screening of these bioactives through insilico drug discovery techniques. such bioactives through in silico drug discovery techniques. In this study, an integrated computational approach was adopted to evaluate the pharmacological prospects of C principal. major C. militaris against selected disease-related targets. constituents against selected disease related targets. Molecular docking was performed to predict binding affinities and active site interactions, while ADMET profiling assessed drug resemblance and safety parameters. cheminformatics tools were employed to identify potential multi target pathways associated with immune regulation and oxidative stress. The results revealed that cordycepin showed strong affinity toward kinase and protease targets involved in tumor progression and viral replication. high affinity toward kinase and protease targets involved in tumor progression and viral replication. Machine learning-based prediction models further confirmed its favorable pharmacokinetic profile and low risk of toxicity. militaris, bridging the gap between traditional ethnopharmacology and modern drug development.

Keywords: Cordyceps militaris, cordycepin, in silico modeling, molecular docking, drug discovery, ADMET.

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Application of Biotechnology in Health

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Abstract:

Biotechnology covers a broad spectrum of scientific applications that are applied in many sectors including health and agriculture. It involves the usage of living organisms, or its parts in order to deliver innovative methods of production and create new products e.g. new vaccine production (through disease diagnosis) to avoid disease-attack; genetically modified plants (to develop resistance against various pests); bacteria having the ability to cleaning up oil spills etc. All these features are related to biotechnology that is totally applicable to human health care. In other words, biotechnology related to human healthcare has a tremendous impact on the necessity of patients and their families as it not only revolves around medicines and diagnostics that are produced employing a biotechnological process, but also involve gene and cell therapies, recombinant DNA products, tissue engineered products and controlling environment pollution. Today, the majorities of innovative medicines either produced using biotechnology or through diagnostic products, are made readily available to the society by applying modern biotechnology in their development and or expansion processes. Moreover, the global landscape of biotechnology in healthcare is characterized by collaborative research initiatives and cross-disciplinary partnerships. The interconnectedness of biotechnology with artificial intelligence and data analytics is explored, highlighting the synergistic potential in unlocking intricate patterns within vast datasets to inform more precise and effective healthcare strategies. As biotechnology accelerates the development of novel therapeutics, including gene and cell therapies, the review addresses ethical considerations, regulatory frameworks, and accessibility challenges.

Keywords: Biotechnology, diagnostic, disease, human health

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Artificial Intelligence in Pharmaceutical Technology

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Abstract

Artificial intelligence (AI) has emerged as a powerful tool that harnesses anthropomorphic knowledge and provides expedited solutions to complex challenges. Remarkable advancements in AI technology and machine learning present a transformative opportunity in the drug discovery, formulation, and testing of pharmaceutical dosage forms. By utilizing AI algorithms that analyse extensive biological data, including genomics and proteomics, researchers can identify disease-associated targets and predict their interactions with potential drug candidates. This enables a more efficient and targeted approach to drug discovery, thereby increasing the likelihood of successful drug approvals. AI can contribute to reducing development costs by optimizing research and development processes. Machine learning algorithms assist in experimental design and can predict the pharmacokinetics and toxicity of drug candidates. This capability enables the prioritization and optimization of lead compounds, reducing the need for extensive and costly animal testing. Personalized medicine approaches can be facilitated through AI algorithms that analyse real-world patient data, leading to more effective treatment outcomes and improved patient adherence. This comprehensive review explores the wide-ranging applications of AI in drug discovery, drug delivery dosage form designs, process optimization, testing, and pharmacokinetics/pharmacodynamics (PK/PD) studies

Keywords: Artificial intelligence (AI), machine learning, drug discovery, formulation, dosage form testing, pharmacokinetics, Pharmacovigilance.

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Drug Delivery System

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Abstract

Drug delivery systems are designed to transport therapeutic agents effectively to achieve optimal treatment outcomes. They improve drug absorption, distribution, and targeted action while reducing side effects. Conventional systems include oral, buccal, rectal, injectable, and transdermal routes. Advanced systems, known as Novel Drug Delivery Systems (NDDS), offer controlled, sustained, and site-specific delivery using nanoparticles, liposomes, microspheres, and implants. These innovations enhance bioavailability, stability, and patient compliance. Future drug delivery focuses on personalized medicine, smart carriers, and nanotechnology to achieve precise and efficient therapy. Improved delivery technologies continue to evolve, supporting better clinical effectiveness and patient care.

Keyword: NDDS, Drug, patient care, bioavailability

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Nuclear Medicine: An Era of Healing Armored with AI

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Abstract

A fundamental principle of medicine is trustworthiness. The components of trust need to be reviewed in light of the development of artificial intelligence (AI) in the medical field. Nuclear medicine is a medical specialty that uses injected radioactive molecules to assess bodily functions and to diagnose and treat disease. The two most used imaging modalities in nuclear medicine are Positron Emission Tomography (PET) scans and Single Photon Emission Computed Tomography (SPECT). AI can be used to prepopulate radiology reports, assist in real-time report generation, help standardize reporting, and perform structured synoptic reporting.

Keyword: SPECT, PET, AI, Nuclear medicine

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Sustained & Targeted Drug Delivery Device In The Treatment Of Dental Diseases

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Abstract

This study presents the development and comprehensive evaluation of a novel biodegradable electrospun nanofiber membrane composed of poly(ε-caprolactone) (PCL) incorporated with Attukal Kizhangu Linn. (AK), aimed at enhancing localized treatment for chronic periodontitis. Electrospinning method was employed to fabricate uniform nanofibers, and optimization of formulation and process variables was achieved using a Box–Behnken statistical design, with focus on entrapment efficiency (EE) and fiber diameter, followed by *in vitro*, *in vivo* characterization to clinical assessment. The optimized formulation exhibited a high EE of 88.36 ± 1.5% and a uniform fiber diameter of 142.6 ± 7.6 nm. Characterization via FTIR, DSC, and PXRD confirmed molecular dispersion of the drug within the polymeric matrix with no chemical interactions. SEM images revealed smooth, homogeneously distributed fibers devoid of structural defects. In vitro drug release studies showed a biphasic, sustained release profile extending up to 20 days. In vivo studies confirmed prolonged release and excellent biocompatibility, with minimal inflammatory cell infiltration over 28 days. Furthermore, clinical evaluation demonstrated that AK-loaded nan fibers, when used adjunctively with scaling and root planning (SRP), significantly improved periodontal outcomes compared to SRP alone, with marked reductions in probing depth, plaque index, and gingival index over 30 days. This novel AK-PCL Nano fiber membrane offers a promising sustained-release drug delivery platform for localized periodontal therapy. Its ability to enhance clinical outcomes, minimize systemic exposure, and reduce dosing frequency represents a significant advancement in the treatment of periodontal disease with improved patient compliance and safety.

Keywords: Electrospinning, AK-PCL, entrapment efficiency, AK

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In-Silico Drug Design Screening, Molecular Docking & Admet Analysis For Multi-Targeting Therapeutic Activity To Treat Whooping Cough (*Pertussis*) And Its Typical Symptoms By Adapting Green Chemistry With Biological Evaluation

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Abstract

A cough is basically referred to a protective reflex event to prevent respiratory tract from aspirating in response to different stimuli. It usually occurs to remove allergens, irritants and mucus from the lung airways, which are essentially foreign substances like smoke, dust, pollen grains, dust mites, mold, insects, or animal further current goals and objectives are to conduct fundamental performance on basic dock studies within selection of ligands were divided into two series as LXGA1 to LXGA20 for A Series and LXGB1 to LXGB20 for B Series with standard drug Dextromethorphan (DXM) to comparison as retrived from PubChem website. Docking based analysis executed with the use of via using Molegro Virtual Docker (MVD-2013, 6.0.1). As, target chosen for chronic cough disease as whooping coughs along with other issues for studies as lung and throat cell proliferation, lung and throat irritation, immunity, analgesic and pyretic activities obtained from PDB official website. From all choice of ligands, these was analysed from our research findings screened out that mainly some through ADMET study and these ligands were shown best potentially active compound's components that will establishing novel future drugs to treat whooping cough conditions and synthesized that makes involving green chemistry approach and further testing through spectral analysis.

Keywords: Chronic Coughing Disease, Whooping Cough, Molecular Docking, Choice of Ligands.

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The Neuroprotective Potentiality of Flavonoids on Alzheimer's Disease

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Abstract

Alzheimer's disease (AD), due to its spread, has become a global health priority, and is characterized by senile dementia and progressive disability. The main cause of AD and other neurodegenerations (Huntington, Parkinson, Amyotrophic Lateral Sclerosis) are aggregated protein accumulation and oxidative damage. Recent research on secondary metabolites of plants such as polyphenols demonstrated that they may slow the progression of AD. The flavonoids' mechanism of action in AD involved the inhibition of acetylcholinesterase, butyryl cholinesterase, Tau protein aggregation, β-secretase, oxidative stress, inflammation, and apoptosis through modulation of signaling pathways which are implicated in cognitive and neuroprotective functions, such as ERK, PI3-kinase/Akt, NFKB, MAPKs, and endogenous antioxidant enzymatic systems. This review focuses on flavonoids and their role in AD, in terms of therapeutic potentiality for human health, antioxidant potential, and specific AD molecular targets.

Keywords: flavonoids; neuroprotection; quercetin; myricetin; epicatechin-gallate; naringenin

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Preparation and Evaluation of Niacinamide Liposomes In Aloe Vera Gel With Salicylic Acid As A Co-Active Anti Acne Agent

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Abstract

Acne vulgaris is a common chronic inflammatory skin disorder that requires formulations capable of delivering active agents effectively to the pilosebaceous unit while minimizing irritation. The present study focuses on the preparation and evaluation of niacinamide-loaded liposomes incorporated into aloe vera gel, with salicylic acid included as a co-active anti-acne agent. Liposomes were prepared using the thin-film hydration method to enhance the stability and skin penetration of niacinamide. The optimized liposomal dispersion was incorporated into aloe vera gel, selected for its soothing, moisturizing, and wound-healing properties that support skin barrier repair. Salicylic acid, a well-established keratolytic and comedolytic agent, was added to enhance exfoliation and reduce inflammation. The developed formulation was evaluated for particle size, zeta potential, entrapment efficiency, pH, spreadability, viscosity, drug content, and in-vitro drug release. Stability studies and ex-vivo permeation studies were also performed to assess the performance of the liposomal gel. Results indicated that the liposomal system improved niacinamide entrapment and provided controlled release, while aloe vera gel offered suitable rheological and skin-compatible characteristics. The combination with salicylic acid demonstrated synergistic anti-acne potential, suggesting that the formulation may serve as an effective and well-tolerated topical therapy for acne management.

Keywords: Niacinamide, Liposomes, Aloe vera gel, Salicylic acid, Anti-acne formulation, Controlled release, Entrapment efficiency

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Formulation and Evaluation of Cyproterone Acetate Loaded Liposomal Gel for Topical Treatment of Hirsutism

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Abstract

Hirsutism is a clinically significant dermatological condition marked by the presence of excessive terminal hair in women, primarily attributed to hyperandrogenism or enhanced follicular androgen sensitivity. Cyproterone acetate, a potent steroidal antiandrogen, is widely used for its therapeutic efficacy; however, oral administration is frequently associated with systemic adverse effects, including endocrine disturbances and hepatotoxicity. Topical delivery may provide a safer and more targeted therapeutic alternative. This study aimed to develop and evaluate a cyproterone acetate-loaded liposomal gel to improve dermal localization, enhance penetration, and minimize systemic absorption for the effective management of hirsutism. Liposomal vesicles were formulated using the thin-film hydration technique with phosphatidylcholine and cholesterol in optimized molar ratios to achieve high entrapment efficiency and suitable vesicle size. The optimized liposomal dispersion was incorporated into a carbopol-based gel to obtain desirable rheological properties and prolonged retention on the skin. The formulation underwent comprehensive evaluation, including pH, viscosity, spreadability, drug content, vesicle size distribution, polydispersity index, entrapment efficiency, and in vitro drug-release studies. The developed liposomal gel demonstrates strong potential as a targeted and safer topical therapeutic option for hirsutism.

Keywords: Hirsutism, Cyproterone acetate, Liposomal gel, Topical delivery, Antiandrogen

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Endometriosis Beyond The Pelvis: Vicarious Menstruation As Extrapelvic Presentation"

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Abstract

Endometriosis beyond the pelvis" means endometrial tissue is growing in locations outside the pelvic organs, while "menstruation as extra pelvic presentation" refers to the symptom of cyclical bleeding from these distant sites, which is called vicarious menstruation. The endometrial like tissue outside the pelvis responds to the menstrual cycle by thickening, breaking down, and bleeding, causing pain and symptom in that specific area such as cyclical bleeding from the nose, eyes, or lungs. Haemolacria or blood in tears, is a rare medical phenomenon that can occur with menstruation or in association with endometriosis defined by the presence of endometrial-like tissue in extra-uterine sites, affects around 10% of fertile women; the ocular system is one of the rarest sites it can be present in. Endometriosis usually requires a biopsy for diagnosis, and the anatomic difficulty of obtaining a biopsy of the ocular system makes ocular endometriosis diagnosis more obscure. We reviewed the literature on ocular endometriosis and ocular vicarious menstruation with the aim to discuss the clinical presentation, necessary workup and various treatment modalities, while also shedding light on the connection between the eyes and endometriosis in general Additionally, the conjunctival vasculature has been found to be responsive to hormonal changes due to the presence of oestrogen and progesterone receptors, causing bleeding at the corresponding sites, even without endometriotic lesions. Clinical correlation of the haemolacria with the menstrual cycle can suffice for a diagnosis of vicarious menstruation, and thus opens the possibility of treatment to provide symptomatic treatment for the patient.

Keywords: Haemolacria, endometriotic lesions, menstruation, Endometriosis

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Design of Polymeric Nanocarriers for Colon-Specific and Prolonged Bioactive Delivery

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Abstract

Colon-targeted drug delivery has attracted growing interest due to its potential to improve the treatment of colon-specific diseases while minimizing systemic side effects. To accomplish the objectives of this study, naringenin-loaded chitosan nanoparticles (NLCN) were developed using the ionic gelation method. A 3^3 factorial experimental design was applied to optimize the formulation, evaluating critical parameters such as zeta potential, particle size, in vitro drug release, drug entrapment efficiency and surface morphology.

Particle size distribution and zeta potential were measured using a Malvern Zetasizer, while drug entrapment efficiency was determined by UV–visible spectrophotometry. Surface morphology was investigated by transmission electron microscopy (TEM), and in vitro release behavior was assessed using a modified Franz diffusion cell. The optimized formulation exhibited a mean particle size of 115.9 ± 10.1 nm, polydispersity index (PDI) of 0.291 ± 0.03, entrapment efficiency of 79.45 ± 5.58%, and a cumulative drug release of 71.01 ± 6.75% over 12 hours. TEM images confirmed nanoscale, spherical particles. A zeta potential of +26.8 mV indicated good colloidal stability.

The results demonstrate that NLCN represent a promising oral delivery system for colon-specific targeting, offering prolonged release and improved therapeutic potential for colon-related disorders.

Keywords: Colon-targeted drug delivery, Naringenin-loaded chitosan nanoparticles, Particle size distribution.

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Role of *Elletaria Cardamomum* in Controlling Triple Negative Breast Cancer

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Abstract
Elettaria cardamomum, known as spice cardamom belongs to the Zingiberaceae family. It have many benefits like antimicrobial, antioxidant, anti-inflammatory, antidiabetic and anticancer activities. In this communication, we have discussed on the anticancer effect of *E .cardamomum*. Cardamom belongs some phytochemicals which have been found effective against malignancies. Scavenging properties of cardamom helps in fighting chemotherapy induced toxicity. Diindolylmethane, linalool, borneol, limonene, cymene, pinene, are the phytochemicals that can act over lignin-1 gene, targeting a programmed cell death. Thus, this article aims to discuss about the cellular; pharmacological effects of cardamom especially in triple negative breast cancer. The mechanism of action of the respective phytochemicals are also discussed.

Keywords: *Elettaria cardamom,* Pharmacological effects, Mechanism of action.