E-SYMPOSIUM PROCEEDINGS

A bimonthly pharma refresh brought to you by Journal of Pharma Insights and Research (JOPIR) ISSN No. 3048-5428
APRIL 2025 VOL. 3, ISSUE 2 DOI: 10.5281/ZENODO.15149942

Contents

E-SYMPOSIUM PROCEEDINGS

A bimonthly pharma refresh brought to you by Journal of Pharma Insights and Research (JOPIR) ISSN No. 3048-5428

APRIL 2025 VOL. 3, ISSUE 2 DOI: 10.5281/ZENODO.15149942

IMPLEMENTATION AND INTEGRATION OF VIRTUAL CLINICAL TRIALS (VCTs) IN HEALTHCARE

Mr. Chandan Sood

PG Scholar, Shiva Institute of Pharmacy, Bilaspur, Himachal Pradesh, India

chandansood10@gmail.com

Abstract: Remote digital technologies have significantly transformed traditional clinical trial methodologies, introducing novel approaches to drug development and patient monitoring. These technologies have enabled the creation of virtual clinical trials (VCTs), which integrate telemedicine platforms and remote monitoring systems to collect patient data without requiring physical site visits. The implementation of wearable devices and mobile applications allows continuous monitoring of vital parameters, medication compliance, and symptom progression, while maintaining data accuracy and improving participant retention. Cloud computing infrastructure has enhanced data management capabilities, leading to faster processing and analysis of clinical information. The integration of artificial intelligence algorithms has improved the identification of clinical patterns and prediction of treatment outcomes, contributing to more efficient trial designs. Digital platforms facilitate the collection of patient-reported outcomes through electronic surveys and daily logs, providing comprehensive insights into treatment effectiveness and patient well-being. Despite these advantages, the widespread implementation of VCTs faces several obstacles, including data security concerns, varying levels of technological accessibility, and complex regulatory requirements. The resolution of these challenges necessitates coordination between clinical researchers, healthcare providers, regulatory authorities, and technology specialists. VCTs represent a significant advancement in clinical research methodology, offering improved accessibility and operational efficiency while maintaining scientific rigor.

Keywords: Virtual clinical trials; Remote monitoring; Digital health; Telemedicine; Clinical research.

NANOCAPSULES FOR ADVANCED DRUG DELIVERY

Miss Isani Dutta

Assistant Professor, DMBH Institute of Medical Sciences, Hooghly, West Bengal, India

isani.dutta13@gmail.com

Abstract: Nanocapsules constitute an innovative class of nanocarrier systems characterized by a unique structural design comprising a core-shell architecture, where therapeutic agents are enclosed within a polymeric membrane. These nanoscale vehicles, typically ranging from 1 to 100 nanometers, demonstrate particular efficacy in the delivery of lipophilic drugs. The fabrication of nanocapsules involves several established methodologies, including polymerization techniques, arc discharge processes, and emulsion-based approaches. Their structural characteristics are defined by specific parameters such as surface area measurements, size distribution, membrane thickness, and permeability profiles. The distinctive properties of nanocapsules enable molecular-level tissue penetration, enhanced absorption rates due to their extensive surface area, and improved cellular uptake of therapeutic agents. In oncological applications, nanocapsules demonstrate selective drug distribution to malignant cells, minimizing adverse effects on healthy tissues and reducing overall drug toxicity. Their versatility extends beyond pharmaceutical applications to various fields, including agrochemical delivery, cosmetic formulations, diagnostic applications, and nutraceutical development. The controlled release properties and targeted delivery capabilities of nanocapsules are determined by their surface characteristics and molecular dimensions, making them valuable tools in modern drug delivery systems. Recent research indicates that these properties significantly influence their therapeutic efficiency and bioavailability, suggesting promising potential for future medical applications.

Keywords: Nanocapsules; Drug delivery systems; Polymeric carriers; Controlled release; Targeted therapy.

E-SYMPOSIUM PROCEEDINGS

A bimonthly pharma refresh brought to you by Journal of Pharma Insights and Research (JOPIR) ISSN No. 3048-5428

APRIL 2025 VOL. 3, ISSUE 2 DOI: 10.5281/ZENODO.15149942

INNOVATIONS AND FUTURE PROSPECTS OF 3D PRINTING IN PHARMACEUTICAL SCIENCES

Mr.Shakul Hameed N*[1], Dr. Rakshana V[2]

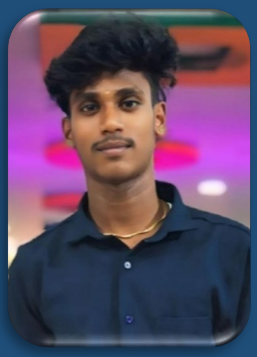
[1]UG Scholar, Faculty of Pharmacy, Bharath Institute of Higher Education and Research, Chennai, Tamil Nadu, India
[2]Assistant Professor, Faculty of Pharmacy, Bharath Institute of Higher Education and Research, Chennai, Tamil Nadu, India

shakulhameed41@gmail.com

Abstract: Three-dimensional (3D) printing technology has emerged as a groundbreaking manufacturing approach in pharmaceutical sciences, enabling precise development of drug formulations with enhanced therapeutic outcomes. This advanced technology facilitates on-demand production of medications with customized dosages, drug combinations, and release profiles, surpassing the limitations of conventional manufacturing methods. The application of 3D printing has led to significant developments in complex drug delivery systems, including multi-layered tablets, orodispersible formulations, and implantable devices, resulting in improved bioavailability. The technology's capacity to create pharmaceuticals with specific geometries and microstructures has proven particularly valuable for patient populations requiring precise dosing, such as pediatric and geriatric groups. The development of polypills through 3D printing represents a notable advancement in improving medication adherence among patients with multiple chronic conditions. From a manufacturing perspective, 3D printing technology offers substantial benefits, including reduced material waste, accelerated drug development processes, and the potential for localized production in healthcare facilities. Current challenges in widespread implementation include production scaling, regulatory compliance, and quality control measures. The integration of biodegradable materials, nanotechnology, and artificial intelligence with 3D printing technology continues to advance drug development methodologies. These innovations indicate significant potential for transforming personalized medicine approaches and improving global access to pharmaceutical products.

Keywords: Three-dimensional printing; Personalized medicine; Drug delivery systems; Pharmaceutical manufacturing; Polypills.

DEVELOPMENT AND INTEGRATION OF DIGITAL MANAGEMENT SYSTEMS FOR MODERN PHARMACEUTICAL OPERATIONS



Mr. Pavithran N*[1], Rejitha C[2]

[1]UG Scholar, Faculty of Pharmacy, Bharath Institute of Higher Education and Research, Chennai, Tamil Nadu, India
[2]Assistant Professor, Faculty of Pharmacy, Bharath Institute of Higher Education and Research, Chennai, Tamil Nadu, India

l.n.pavithran@gmail.com

Abstract: The transition from manual to digital pharmacy management systems represents a significant advancement in pharmaceutical operations, incorporating information and communication technology (ICT) to enhance operational efficiency and data management. This digital transformation aims to improve inventory control, financial tracking, and stakeholder communication while maintaining regulatory compliance and data security. The system architecture employs the waterfall methodology within the System Development Life Cycle (SDLC), utilizing a comprehensive technology stack including PHP, HTML, CSS, and MySQL database management. The implementation focuses on creating a secure, user-friendly interface that enables real-time inventory tracking, automated billing processes, and efficient supplier management. The system's core functionalities include automated documentation generation, comprehensive reporting capabilities, and streamlined communication channels between pharmacies and customers. Database authentication protocols and user validation mechanisms ensure data integrity and secure access control. The platform demonstrates versatility in both web-based and local implementations, providing essential features such as invoice generation, inventory management, and supplier tracking. This digital transformation in pharmacy operations represents a significant step toward modernizing pharmaceutical retail management, offering improved accuracy, efficiency, and service delivery in contemporary pharmacy practice.

Keywords: Pharmacy management; Digital healthcare; Database management; Healthcare informatics; Automated operations.

E-SYMPOSIUM PROCEEDINGS

A bimonthly pharma refresh brought to you by Journal of Pharma Insights and Research (JOPIR) ISSN No. 3048-5428

APRIL 2025 VOL. 3, ISSUE 2 DOI: 10.5281/ZENODO.15149942

INTEGRATION OF NANOMATERIALS IN THREE DIMENSIONAL AND FOUR DIMENSIONAL BIOPRINTING FOR ADVANCED TISSUE ENGINEERING

Miss Vasanthi A V*, Miss Medha Gayatri Bhatiprollu

UG Scholar, Sarojini Naidu Vanita Pharmacy Maha Vidyalaya, Hyderabad, Telangana, India

vasanthi20230104@gmail.com

Abstract: Three-dimensional (3D) bioprinting technology has emerged as a revolutionary approach in tissue engineering and regenerative medicine, enabling the production of patient-specific tissue scaffolds and therapeutic constructs. The incorporation of nanomaterials into bioprinting processes has significantly enhanced the physical, chemical, and biological properties of printed scaffolds. These nanomaterials exhibit unique characteristics, including quantum effects and optimized surface area-to-volume ratios, which contribute to improved scaffold functionality and enhanced tissue mimicry. The integration of nanomaterials in bioprinting processes has resulted in scaffolds with superior structural integrity, leading to more effective tissue regeneration outcomes. The emergence of four-dimensional (4D) bioprinting introduces an additional temporal dimension, creating dynamic scaffolds that respond to environmental stimuli. This advancement enables applications in bioactuation, biorobotics, and biosensing systems. The synergistic combination of biomaterials, cellular components, and stimuli-responsive materials in 4D bioprinting facilitates the development of tissue constructs with programmable temporal modifications, providing more accurate representations of biological systems. The convergence of nanotechnology with advanced bioprinting techniques presents significant opportunities for developing sophisticated tissue engineering platforms and regenerative medicine applications.

Keywords: Bioprinting; Nanomaterials; Tissue engineering; Scaffold design; Regenerative medicine.

NOVEL TREATMENT STRATEGIES IN SCHIZOPHRENIA MANAGEMENT

Miss Gosiya

UG Scholar, Yogendra Nath Saxena College of Pharmacy & Research Centre, Hasanpur, Uttar Pradesh, India

gosiyaynscop@gmail.com

Abstract: Schizophrenia manifests as a severe neuropsychiatric condition characterized by cognitive deficits, hallucinations, and behavioral abnormalities. Current pharmacological interventions primarily target dopaminergic pathways, yet demonstrate limited efficacy and significant adverse effects. Recent research has identified promising therapeutic targets, including glutamatergic system modulation through N-methyl-D-aspartate (NMDA) receptor antagonists, anti-inflammatory agents, and microbiome-targeted interventions. Advanced neuroimaging techniques combined with artificial intelligence applications have enhanced early diagnosis capabilities and treatment optimization strategies. Novel therapeutic approaches include stem cell-based interventions and gene editing technologies, which address underlying neurobiological alterations. Digital therapeutic platforms incorporating cognitive remediation protocols and virtual reality-based rehabilitation show potential in improving cognitive and social functioning. These emerging treatment modalities face challenges including therapeutic resistance and requirements for extensive clinical validation. The integration of precision medicine approaches with advanced diagnostic tools presents opportunities for personalized treatment strategies. Continued advancement in schizophrenia treatment necessitates robust clinical validation and interdisciplinary collaboration to optimize therapeutic outcomes.

Keywords: Schizophrenia; NMDA receptor; Neuroinflammation; Digital therapeutics; Precision medicine.

E-SYMPOSIUM PROCEEDINGS

A bimonthly pharma refresh brought to you by Journal of Pharma Insights and Research (JOPIR) ISSN No. 3048-5428

APRIL 2025 VOL. 3, ISSUE 2 DOI: 10.5281/ZENODO.15149942

COMPARATIVE EVALUATION OF ANTI-INFLAMMATORY AND COGNITIVE ENHANCEMENT ACTIVITY OF CALCIUM CHANNEL BLOCKERS

Mrs Lakshmi P A D G [*1], Dr. Veeresh Babu P[2]

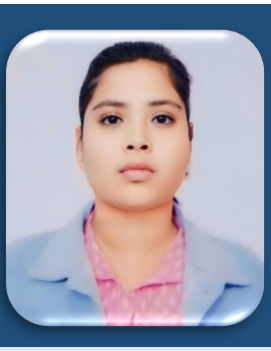
[1] *Assistant Professor, Gokaraju Rangaraju College of Pharmacy, Hyderabad, Telangana, India*
[2] *Associate Professor, Gokaraju Rangaraju College of Pharmacy, Hyderabad, Telangana, India*

ahalyapati8087@grcp.ac.in

Abstract: Calcium ion influx plays a critical role in prostaglandin synthesis and inflammatory cascade activation. Disruption of calcium homeostasis contributes significantly to neurodegeneration pathophysiology. This study investigated the antioxidant, anti-inflammatory, and cognitive enhancement properties of three calcium channel antagonists - verapamil, diltiazem, and amlodipine - in experimental models. The compounds demonstrated significant free radical scavenging activity in superoxide and hydroxyl radical assays. Pre-treatment with these agents resulted in marked reduction of acute carrageenan-induced and chronic formaldehyde-induced inflammation. The compounds also showed protective effects against memory impairment in diazepam-induced acute amnesia and aluminum chloride-induced chronic amnesia models. No significant alterations in acetylcholinesterase levels were observed, suggesting acetylcholine-independent mechanisms. Among the tested compounds, amlodipine exhibited superior anti-inflammatory and cognitive enhancement effects, potentially due to enhanced blood-brain barrier penetration. These findings suggest potential therapeutic applications of calcium channel antagonists in managing neurodegenerative conditions, particularly Alzheimer's disease.

Keywords: Calcium channel antagonists; Antioxidant activity; Neuroinflammation; Cognitive function; Neuroprotection.

NEUROPROTECTIVE AND COGNITIVE ENHANCEMENT POTENTIAL OF *GINKGO BILOBA* EXTRACT IN ALZHEIMER'S DISEASE



Miss Mousam

UG Scholar, Delhi College of Pharmacy-DIRD, Holambi Khurd, Delhi, India

chaudharymausam551@gmail.com

Abstract: Alzheimer's disease (AD) represents a progressive neurodegenerative disorder characterized by neuritic plaques and neurofibrillary tangles resulting from amyloid-beta peptide accumulation in brain tissue. Current global prevalence estimates indicate 50 million AD cases, projected to reach 152 million by 2025. Standard pharmacological interventions, including acetylcholinesterase inhibitors (donepezil, galantamine, tacrine), present limitations due to cost and adverse effects. *Ginkgo biloba* extract EGb761, standardized to contain 6% terpene lactones (including ginkgolides A, B, C, and bilobalide) and 24% flavone glycosides (quercetin, kaempferol, isorhamnetin), demonstrates significant therapeutic potential. The extract exhibits multiple mechanisms of action, including antioxidant activity, inhibition of amyloid-beta aggregation, modulation of neurotransmitter systems, and enhancement of neuroplasticity. Preclinical studies indicate improvements in cognitive function and memory performance. The active compounds in EGb761 demonstrate neuroprotective properties through regulation of acetylcholine transmission and reduction of oxidative stress and neuroinflammation, suggesting potential therapeutic applications in AD management.

Keywords: Alzheimer's disease; *Ginkgo biloba*; EGb761; Neuroprotection; Cognitive enhancement.

E-SYMPOSIUM PROCEEDINGS

A bimonthly pharma refresh brought to you by Journal of Pharma Insights and Research (JOPIR) ISSN No. 3048-5428

APRIL 2025 VOL. 3, ISSUE 2 DOI: 10.5281/ZENODO.15149942

RECENT ADVANCES IN THIAZOLE CHEMISTRY AND ITS APPLICATIONS IN DRUG DEVELOPMENT

Mr. Shivansh Kumar Singh

UG Scholar, Delhi College of Pharmacy-DIRD, Holambi Khurd, Delhi, India

shivansh010104@gmail.com

Abstract: Thiazole (C_3H_3NS), a heterocyclic compound with molecular weight 85.13 g/mol, represents a significant scaffold in medicinal chemistry. The compound's distinctive structure, featuring sulfur at position 1 and nitrogen at position 3, creates a delocalized π-electron system conferring aromatic properties. Thiazole derivatives demonstrate diverse pharmacological activities, including antibacterial, antifungal, antiviral, anticancer, and anti-inflammatory effects. The thiazole ring serves as a key structural component in numerous therapeutic agents, including cefotaxime (antibacterial), meloxicam (anti-inflammatory), ritonavir (antiviral), pramipexole (CNS modulator), and nitazoxanide (antiparasitic). Natural occurrence of thiazole moieties in bioactive compounds such as thiamine (vitamin B1), firefly luciferin, and erythrazole B underscores their biological significance. Chemical reactivity of thiazole encompasses donor-acceptor interactions, nucleophilic substitution, arylation, photochemical transformations, cycloaddition, and oxidation reactions. Synthetic approaches including Gabriel and Hantzsch methodologies facilitate the preparation of thiazole derivatives for pharmaceutical applications.

Keywords: Thiazole derivatives; Heterocyclic compounds; Drug development; Pharmaceutical chemistry; Structure-activity relationships.

SYSTEMIC MANIFESTATIONS AND CLINICAL MANAGEMENT IN ADVANCED CHRONIC LIVER DISEASE

Miss. Meghana Gandepalli

UG Scholar, Vijaya Institute of Pharmaceutical Sciences for Women, Vijayawada, Andhra Pradesh, India

gandepallimeghana6099@gmail.com

Abstract: Chronic liver disease (CLD) presents complex pathophysiological mechanisms affecting multiple organ systems. A representative case of a 74-year-old male with hepatorenal syndrome type 1 and severe anemia demonstrates the multisystem impact of advanced liver disease. Clinical presentation included dyspnea, bilateral pedal edema, abdominal distension, and physical findings of pallor, digital clubbing, and hepatomegaly. Diagnostic imaging revealed cirrhosis, portal hypertension, ascites, and renal cortical cysts. Cardiopulmonary evaluation demonstrated pulmonary trunk enlargement, atrial fibrillation, and QT interval prolongation. Laboratory studies confirmed severe anemia, leukopenia, and reduced erythrocyte count, while endoscopic examination revealed early esophageal varices. The pathophysiological cascade involved cirrhotic cardiomyopathy with concurrent diastolic dysfunction and cardiac conduction abnormalities. Hematological complications resulted from chronic blood loss, splenic sequestration, and impaired erythropoiesis, compounded by hepatorenal syndrome-induced inflammatory responses. Optimal patient outcomes require integrated therapeutic approaches coordinating hepatology, cardiology, nephrology, and hematology interventions.

Keywords: Advanced liver disease; Hepatorenal syndrome; Cirrhotic cardiomyopathy; Multiorgan dysfunction; Integrated patient care.