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PALLAVARAM, THALAMBUR, PERIYAPALAYAM, THIRUVANMIYUR - CHENNAI

APP ABSTRACT- APP 2026-002

Unlocking the Power of Nano-medicine, Revolutionizing Opioid Therapy: A review

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Abstract

Objective: Opioids represent one of the oldest classes of drugs in medicine and remain central to pain management. The aim of this literature review is to summarize the latest research on opioid nano formulations and their ability to increase analgesic efficacy while minimizing associated risks. Preclinical studies have already demonstrated that both liposomal and dendrimer-based opioid formulations allow for extended release and, consequently, more prolonged and stable analgesia.

Methodology: This narrative review was conducted to evaluate the role of NPs in opioid-based analgesia and in mitigating the harms associated with opioid use. Key methodologies include formulation of nanocarriers, surface functionalization for targeted delivery, and stimuli responsive release systems.

Results: Nano medicine improves opioid therapy by optimizing pharmacokinetics and drug delivery system, which is helpful in maintaining analgesia and reducing the adverse effect. Nanoformulations such as liposomes and dendrimer based opioid formulations allow sustained, controlled drug release and have higher rate of bioavailability.

Conclusion: Nano medicine-based delivery systems represent promising tools for providing effective analgesia for patients. Interdisciplinary collaboration among materials scientists, pharmacologists, anesthesiologists, and regulatory authorities is essential for the establishment of standardized evaluation pipelines for opioid nanoformulations. Only through such coordinated efforts will nanomedicine evolve into a clinically reliable and widely accessible tool for both effective and safe pain management. Keywords Nanoparticle, liposomes, dendrimers, nanoemulsions, opioids.

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APP ABSTRACT- APP 2026-002

Advancing ER-positive breast cancer risk reduction from traditional SERMs to heterocyclic scaffolds and dual SERM-SERD combinations”

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Abstract

Background: Breast cancer is most prevelant non skin cancer in women and ER-positive breast cancer , is considered second leading cause of cancer related mortality .Driven by estrogen signalling , is the most prevelant subtype worldwide.This narrative review explores riskfactors ,assessment tools,and summarizes the effectiveness and side effects of chemopreventive agents used for breast cancer risk reduction. Selective estrogen receptor modulators (SERM)remain essential therauptics ,antagonizing estrogen activity in breast tissue while retaining agonist effect in bones and CVS.

Methodology: While traditional reviews have focused on triphenylethylene and benzothiophene scaffolds, heterocyclic SERMS-including indole, bezimidazole, coumarin, benzopyran . Raloxifene has better safety profiles compared to tamoxifene. AI,like anastrazole and exemestane,reduce invasive breast cancer at the same time tamoxifen mimics estrogen there ,it can cause the uterine lining to thicken, slightly increasing the risk of uterine cancer.

Results: Tamoxifene, a selective estrogen receptor modulator(SERM)demonstrated efficacy in reducing breast cancer risk in postmenopausal and premenopausal women . Major limitations include incomplete receptor subtype selectivity,metabolic instability,partial agonism in nontarget tissues this work uniquely integrates structural,mechanistic ,and therauptic insights including dual SERM-SERDscaffolds combination with aromatase inhibitors and computationally guided subtype -selective design to overcome resistance,improve potency,and optimize clinical outcomes in ER-POSITIVE breast cancer therapy.

Conclusion: Chemopreventive agents present oppurtunities in reduction of breast cancer further research is needed to compare the effectiveness of SERMs and AI, especially in high risk populations with pathogenic germiline mutation Keywords -chemopreventive agents, SERM, ERpositive breast cancer, dual SERM-SERD scaffolds uterine, cancer risk, comptutational design,tamoxifen,raloxifene, aromatase inhibitors

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APP ABSTRACT- APP 2026-002

Impact of Antimicrobial Stewardship Program on Reducing Antibiotic Drug-Related Problems in Hospitalized Patients

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Abstract

Objective: Antibiotic-related drug-related problems (DRPs) occur frequently in hospitalized patients, which lead to antimicrobial resistance, adverse drug reactions, longer hospital stays and higher healthcare expenses. Antimicrobial stewardship programs have been implemented globally to ensure the proper use of antibiotics. This study aimed to evaluate the effectiveness of antimicrobial Stewardship Program in reducing the antibiotic drug-related problems in hospitalized patients.

Methodology: Researchers conducted a systematic review through the analysis of 75 peer-reviewed studies to evaluate the impact of Antimicrobial Stewardship Programs (ASPs) on reducing antibiotic-related drug-related problems (DRPs) in hospitalized patients. The study collected data on antibiotic-related drug-related problems, antimicrobial utilization, prescribing compliance, stewardship interventions, physician acceptance, readmission rates, hospital stay duration, resistance patterns, and costs to compare the results before and after ASP implementation.

Results: Before the implementation of ASP, the research found that 60 to 85% of hospitalized patients experienced at least one antibiotic-related DRP, mainly inappropriate drug selection, dosing errors, unnecessary therapy, prolonged duration, and drug–drug interactions. After Antimicrobial Stewardship Program implementation, antibiotic consumption decreased by 15–28%, with reduced use of broad-spectrum antimicrobial agents. Key interventions included dose/frequency modification, renal dose adjustment, alternative targeted therapy, discontinuation of unnecessary antibiotics, de-escalation, therapeutic drug monitoring, IV-to-oral switch, and guideline-based prophylaxis optimization. Physician acceptance of pharmacist recommendations exceeded 85% in most studies, suboptimal antibiotic therapy dropped by 62%, 30-day readmission rates decreased from 51.16% to 21.95%, and patients spent less time in hospitals. Pharmacist-led interventions reduced antibiotic therapy problems by up to 62%, while antibiotic costs decreased by 55.5%.

Conclusion: The evidence demonstrates that ASPs effectively decrease antibiotic-related DRPs in hospitalized patients. Structured stewardship interventions lead to better clinical results, reduce antibiotic resistance and healthcare expenses, and enhance overall patient safety. The implementation of antimicrobial stewardship programs together with clinical pharmacist involvement to achieve DRP reduction.

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APP ABSTRACT- APP 2026-002

Mesenchymal Stem Cell–Derived Exosomes as Nanocarriers: Biogenesis, Isolation, and Mangiferin Encapsulation for Targeted Drug Delivery"

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ABSTRACT

Introduction: Exosomes are small extracellular vesicles (30-150 nm) naturally secreted by cells and play an essential role in intercellular communication. They originate through a regulated intracellular process known as exosome biogenesis, where early endosomes mature into multivesicular bodies (MVBs) containing intraluminal vesicles that are later released as exosomes upon fusion with the plasma membrane. Due to their nanoscale size, biocompatibility, and ability to transport proteins and bioactive molecules, exosomes have emerged as promising drug delivery systems. Mesenchymal stem cells derived from umbilical cord blood are an efficient source for exosome production because of their high proliferative capacity and regenerative properties. Mangiferin, a bioactive phytochemical obtained from Mangifera indica, possesses significant antioxidant, anti inflammatory, and anticancer activities, making it a potential therapeutic candidate.

Methods: Umbilical cord blood was utilized for the isolation and culture of mesenchymal stem cells under sterile in vitro conditions. After achieving sufficient cell proliferation, exosomes were isolated from the conditioned culture medium using standard exosome isolation techniques. The isolated exosomes were then purified and prepared for drug loading. Mangiferin was subsequently incorporated into the exosomal vesicles to evaluate their potential as nanocarriers for targeted therapeutic delivery.

Results: The isolated mesenchymal stem cell-derived exosomes possess suitable characteristics for its use as biological nanocarriers. Loading of mangiferin into the exosomal vesicles was successfully achieved, indicating the feasibility of utilizing these vesicles for phytochemical delivery.

Conclusion: The study highlights the potential of mesenchymal stem cell-derived exosomes as effective drug delivery vehicles. Loading mangiferin into exosomes may enhance targeted therapeutic delivery and improve the pharmacological potential of natural compounds in future disease treatment strategies.

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APP ABSTRACT- APP 2026-002

Isolation and In-Vitro Expansion of Human Umbilical Cord–Derived Mesenchymal Stem Cells for Regenerative and Therapeutic Applications. “

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Abstract

Introduction

Human umbilical cord blood and tissue are valuable sources of stem cells with significant potential in regenerative medicine and cellular therapy. Among them, mesenchymal stem cells (MSCs) derived from the umbilical cord are widely studied due to their self-renewal capacity, multipotent differentiation ability, and low immunogenicity. Natural bioactive compounds such as mangiferin have gained attention for their potential to enhance stem cell viability and therapeutic properties. The present study focuses on the isolation and in-vitro culture of human umbilical cord–derived mesenchymal stem cells as a foundational step for further experimental evaluation involving mangiferin and other therapeutic approaches.

Methods

Human umbilical cord samples were collected under sterile conditions and processed in the laboratory. The Wharton’s jelly region of the umbilical cord was dissected and subjected to enzymatic and/or explant culture techniques for the isolation of mesenchymal stem cells. The isolated cells were cultured in appropriate growth medium supplemented with fetal bovine serum and antibiotics, and incubated under controlled conditions. Cell morphology, adherence properties, and proliferation were monitored using microscopic observation. Subsequent passages were carried out to maintain and expand the MSC population for experimental studies.

Results

The isolation process yielded spindle-shaped fibroblast-like cells characteristic of mesenchymal stem cells. The cultured cells demonstrated strong plastic adherence and proliferative capacity during successive passages. Morphological observation confirmed the successful establishment of a stable MSC culture from umbilical cord tissue, providing a suitable in-vitro model for further biological and pharmacological investigations.

Conclusion

Human umbilical cord tissue serves as an effective and non-invasive source of mesenchymal stem cells. The successful isolation and culture of these cells establish a reliable platform for downstream applications such as drug testing, regenerative medicine studies, and evaluation of natural bioactive compounds like mangiferin. These findings support the potential of umbilical cord–derived MSCs as an important cellular resource for biomedical research and therapeutic development.

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APP ABSTRACT- APP 2026-002

Computational Docking Study of Mangiferin with Human Umbilical Cord and Umbilical Cord Derived Exosomal Protein Targets

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ABSTRACT

Introduction

Colorectal cancer is one of the leading causes of cancer-related mortality worldwide, highlighting the need for improved therapeutic strategies. Natural bioactive compounds have gained attention due to their diverse pharmacological activities and lower toxicity. Mangiferin, a xanthone glycoside from Mangifera indica, is known for its antioxidant, anti inflammatory, and anticancer properties. In regenerative medicine, human umbilical cord–derived mesenchymal stem cells and their extracellular vesicles (exosomes) play an important role in cell communication and therapeutic applications. These vesicles contain proteins and signaling molecules that can influence cellular processes. Therefore, the present study aims to evaluate the molecular interaction between mangiferin and selected human umbilical cord and umbilical cord-derived exosomal protein targets using in-silico molecular docking analysis.

Methods The three-dimensional structure of mangiferin was obtained from chemical databases and prepared as the ligand for docking analysis. Protein structures related to human umbilical cord tissues and umbilical cord-derived exosomes were retrieved from protein databases. Molecular docking studies were carried out using AutoDock-based computational tools to determine binding affinity and interaction patterns between mangiferin and the selected protein targets. The docked complexes were further analyzed using molecular visualization software to identify binding energy values, hydrogen bond interactions, and amino acid residues involved in ligand–protein binding.

Results Docking results indicated that mangiferin exhibited stable binding interactions with several human umbilical cord and exosome-associated protein targets. The ligand demonstrated favorable binding energies and formed multiple hydrogen bonds and hydrophobic interactions within the active sites of the proteins, suggesting strong molecular affinity and stable ligand–protein complexes.

Conclusion This in-silico docking study indicates that mangiferin interacts with human umbilical cord and exosomal protein targets, suggesting potential relevance in regenerative, exosome-based therapeutic approaches and supporting further studies on its possible role in cancer research