RESEARCH CENTRE NEWS

CONGRATULATIONS!!

DR.NEBU GEORGE THOMAS– (Tissue Engineering and Regenerative Medicine lab, Pushpagiri research centre) On your Collaborative patent with central institute of fisheries technology and Catholicate college Pathanamthitta for development of nano fibrous tissue engineering scaffolds

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(57) Abstract :
ABSTRACT NANOFIBERS AND A PROCESS FOR THEIR PREPARATION The present disclosure relates to nanofibers comprising a core and a shell. The nanofibers of the present disclosure comprising the core-shell structure provides a robust and stable framework, enhancing structural integrity, crucial for bone regeneration, ensures effective mechanical support, and promoting the development of a scaffold conducive to tissue growth. Further, the present disclosure provides a simple and economical process for the preparation of nanofibers.

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By Sukumaran Anil ; Nebu George Thomas ; Vishnupriya K. Sweety ; Nibu Varghese

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Nanocellulose has emerged as a promising biomaterial for tissue engineering applications, particularly in the regeneration of bone and cartilage. This chapter explores the unique properties of and synthesis methods for nanocellulose and its potential in development of hybrid systems for

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ORIGINAL ARTICLE

Fluoride Concentrations in Different Brands of Toothpaste Marketed in Saudi Arabia

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Article

Biomolecular Interaction of Carnosine and Anti-TB Drug: Preparation of Functional Biopeptide-Based Nanocomposites and Characterization through In Vitro and In Silico Investigations

Usharani Nagarajan, Aniket Naha, Gayathri Ashok, Angayarkanni Balasubramanian, Sudha Ramaiah, Swarna V Kanth, Azger Dusthackeer, Anand Anbarasu,* and Saravanan Natarajan*

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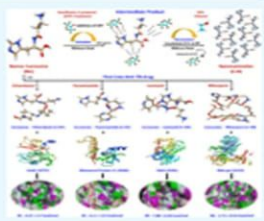
ABSTRACT: Host-directed therapies (HDTs) resolve excessive inflammation during tuberculosis (TB) disease, which leads to irreversible lung tissue damage. The peptide-based nanostructures possess intrinsic anti-inflammatory and antioxidant properties among HDTs. Native carnosine, a natural dipeptide with superior self-organization and functionalities, was chosen for nanoformulation. In the present work, multiscale self-assembly approaches of carnosine were developed using a solvent-mediated process (hexafluoro-2-propanol) and further linked with first-line anti-TB drugs. The organofluorine compound in a solvent is attributed to the self-assembling process with heteroatom acceptors in carnosine. In the carnosine-anti-TB drug nanocomposite, the functional moieties represent the involvement of hydrogen bonding and the electrostatic force of attraction. The minimum inhibitory concentration of carnosine-anti-TB drug composites represents an antimycobacterial effect on par with standard drugs. The silicon findings complemented the in vitro results through quantum chemical simulations, elucidating the respective binding pockets between putative *Mtb* drug targets and carnosine-anti-TB composites. These findings confirmed that the carnosine and anti-TB drug nanocomposites prepared through a solvent-mediated process act as a rational design for functional nanodelivery systems for sustainable TB therapeutics.



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1. INTRODUCTION

Tuberculosis (TB) is the second leading infectious disease from a single infectious agent, after COVID-19.[1] According to WHO report 2022, the TB death rate fell until 2019, followed by an increase in 2020 and 2021, as evidenced in four of the six WHO regions.[2] This creates a pressing situation to boost the recovery rate of TB patients owing to its prolonged duration of therapy, high pill burden, poor patient compliance, and stringent management regimens in the treatment of TB.[3] In TB chemotherapy, the introduction of nanotechnology has gained a broader scope in diagnosis, treatment, and delivery mechanisms. Compared to parenteral or oral deliveries, nanodelivery of drugs through pulmonary mode reaches directly to alveolar macrophage, which is the primary site for TB infection and localization of *Mycobacterium tuberculosis* (*Mtb*).[4] In the recent past, the choice of peptides has been repurposed for the delivery of conventional drugs for treatment regimens. The molecular self-organization of these peptides is significant in generating functionalized materials with biomimetic properties.[4] Still, challenges exist in the development process, such as the production cost, the availability of raw material, and enhanced biodegradability in the case of peptide research. Considering this, carnosine, a natural dipeptide with intrinsic anti-inflammatory and antioxidant properties, was chosen for the study. As a naturally occurring endogenous dipeptide, carnosine has proven to perform well-demonstrated multiaxial functions such as balancing the reactive oxygen species, pro-inflammatory regulation, and modulating immunometabolic behavior of cells. Moreover, researchers have extended protective activities in various cell types such as heterogeneous cells, microglial, endothelial cells, stem cells, etc. In particular, they were found to be more effective in the case of macrophages and microglia.[5]

Carnosine possesses distinct functional properties such as neutralizing harmful free radicals in the host (antioxidant balance), reducing inflammation in various tissues (pro-resolving pathways), capable of protecting the brain cells by evading the brain blood barrier (neuroprotective benefits), reversing the formation of antiglycation activity, and also ameliorating the endurance of muscle properties and decreasing the fatigue during stress conditions.[6] The combinatorial effect of carnosine in the supplementation and therapeutic use makes it more versatile and benign than other therapeutic peptides. These biofunctions of carnosine highlight

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FACTORS INFLUENCING RELAPSE AMONG ALCOHOL DEPENDENT PATIENTS- A MIXED METHOD STUDY

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Medical Faculty Competence in Multiple Choice Question Design and Analysis- Mixed Methods Study

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Abstract

Background *Multiple Choice Questions (MCQs) are an objective tool to assess medical students' knowledge. However, the effectiveness of MCQs in evaluating Bloom's higher order cognitive skills such as application and analysis, depends on their quality. This study addresses shortcomings of MCQs used in medical assessments, like inadequate content validity, limited assessment of non-knowledge-based domains, or the impact of construct-irrelevant variance on MCQ answerability. It highlights the need for improving MCQ quality and the importance of item analysis, especially with the upcoming National Exit Test (NEXT).*

Materials & methods *A mixed-methods approach was used to assess the knowledge, awareness, and skills of medical faculty in designing effective MCQs. A validated questionnaire was administered to evaluate their*