RESEARCH CENTRE NEWS

Pushpagiri Research Centre Strengthens Global Collaborations with Visit to Cardiff Metropolitan University*

Cardiff, UK – 29th November 2024

In a significant step toward fostering international research collaborations, *Rev. Fr. Mathew Mazhavancheril, Research Director of Pushpagiri Research Centre (PRC), Pushpagiri Group of Institutions, Tiruvalla, Kerala, India, led a delegation to **Cardiff Metropolitan University – Llandaff Campus*. The visit aimed to explore avenues for academic exchange, collaborative research, and institutional partnerships between the two prestigious institutions.

The discussions commenced with a meeting with *Prof. Daniel Heggs, Associate Dean for Partnerships, who elaborated on Cardiff Metropolitan University's vision for global academic collaborations. He shared insights into a **student exchange program* being developed for 2025, which aims to strengthen institutional ties and facilitate knowledge exchange between faculty and students of both institutions.

A crucial highlight of the visit was the meeting with *Prof. Chris Wallis (Food Science and Nutrition), an expert in multidisciplinary research bridging **Chemistry, Biology, and Polymer Science. The discussions centered on **potential research collaborations, particularly focusing on **hydrogels and plant extracts*— areas of mutual interest that align with PRC's ongoing research in biomaterials and tissue regeneration.

The delegation also participated in a special session with the *Microbiology and Infection Research Group, where leading scientists presented their research. **Rev. Fr. Mathew Mazhavancheril* introduced PRC's diverse research portfolio, emphasizing its contributions to biomedical sciences, animal model studies, and translational medicine. *Dr. Sarah Hooper* showcased her work on a *chronic wound infection model, expressing a keen interest in PRC's extensive research on **animal studies* and potential collaborative opportunities. *Dr. Mike Beeton* presented his research on *Mycoplasma infections, while **Dr. Paul Livingstone* discussed his cutting-edge work on *antimicrobial peptides and Myxobacteria. Notably, **Dr. Livingstone is already collaborating with PRC* and is actively working on grant proposals with *Dr. Yogesh Dalvi* to further strengthen this partnership.

The visit also included a *tour of Cardiff Metropolitan University's research laboratories, providing insights into advanced research methodologies and infrastructure. This first-hand exposure to **state-of-the-art facilities and ongoing research projects* laid a strong foundation for future joint research initiatives and knowledge exchange programs.

A Step Towards Strengthening PRC's Global Research Footprint

This strategic visit underscores PRC's *commitment to advancing global collaborations in biomedical sciences. By fostering partnerships with **renowned international institutions, PRC is expanding its research horizons, contributing to scientific advancements, and reinforcing its position as a **leader in interdisciplinary and translational research*. This engagement with Cardiff Metropolitan University marks another milestone in PRC's mission to drive innovation and excellence in healthcare research.

Presentation about PRC by Rev. Fr. Mathew Mazhavancheril at Cardiff Metropolitan University, UK

With Team Leader, Prof. Carolyn Wallace from the University of South Wales. We are soon joining hands with them for a project on Family Resilience along with AIIMS, Rishikesh. Dr Ajeet Singh Bhadoria and Dr Vartika Saxena from AIIMS Rishikesh along with Anitha Livingstone of USW are also seen.

FRAIT – India Meeting

An online meeting of FRAIT- collaboration with Wales University , UK was conducted on 9.1.2025. FRAIT project underscores the need for a culturally relevant assessment tool for families with young children (under 6 years). It also emphasises the importance of early childhood development and the impact of cultural context on family dynamics .During the meeting the FRAIT team from UK and India exchanged introductions and discussed the possible functional framework. Rev. Dr. Mathew Mazhavancheril , Director PRC suggested that MOU will need to be signed to which they agreed. They briefly introduced the study, its purpose and methodology. They also asked about financial requirements and it was decided to finalize it by the next meeting. They asked of the Indian side to provide a map of the area of our location which was provided that day itself. They discussed the expectations that we can have from this study. Online Meetings have been arranged on every Thursdays to update the Progress of the Project. Dr. Betsy A Jose, Dr. Meena Isaac and Dr. Rosin George Varghese (Assistant Professors, Community Medicine, PRC Faculty) attended the Meeting along with Carolyn Wallace – PI – University of South Wales,Anitha Livingstone – Co-Investigator and cultural lead - University of South Wales,Michelle Thomas - Co-Investigator - University of South Wales,David Pontin - Co-Investigator - University of South Wales

FRAIT group of University of South Wales

1) Rev. Fr Thomas Varghese (Assistant professor, Dept. of Zoology)Dr. Suboj Babykutty (Associate Professor, Dept. of Zoology, MIC)Rev. Fr Thomas Kayyalakkal (Bursar)Dr. Meera George(Principal, MIC)Rev. Dr. Mathew Mazhavancheril,Director and Head Pushpagiri Research Centre, Thiruvalla Dr. Nebu George Thomas,Professor and Scientist Pushpagiri Research Centre Thiruvalla,Dr. Aniket Naha,Scientist Pushpagiri Research CentreThiruvalla

MoU SIGN WITH MAR IVANIOS COLLEGE FOR COLLABORATIVE CANCER RESEARCH

Pushpagiri Research Centre has made a major leap forward in signing a Memorandum of Understanding (MoU) with Mar Ivanios College for Cancer Research. This collaboration addresses the critical issues of genetic mapping and immune response monitoring in samples obtained from breast cancer patients, and it could mark the beginning of a new era in cancer research. It is expected that with the synergies of both institutions, this partnership will not only seek to expand the horizon of knowledge but will also have tangible wider social benefits through improving patient care and supporting the war against cancer. The new developments resulting from the joint activity of the two centres could enable the development of more tailored and optimal remedies for breast cancer patients. Dr. Jency Joy C (Associate Professor, Department of Oncology) and Dr. Reeba Mary Issac (Assistant Professor, Department of Immuno Haematology and Blood Transfusion Medicine) are also involved in this collaborative research

PUBLICATIONS

Regenerative Engineering and Translational Medicine
https://doi.org/10.1007/s40883-024-00380-y

ORIGINAL RESEARCH

Unravelling the Potential of Carboxymethyl Cellulose Hydrogels for Articular Cartilage Repair: A Rat Model Study

Sreeja Harikumar Aswathy[1] · Nebu George Thomas[2] · Yogesh Bharat Dalvi[2] · Madhan Balraman[3] · Uttamchand NarendraKumar[4] · Inderchand Manjubala[1]

Received: 8 October 2024 / Revised: 23 November 2024 / Accepted: 23 December 2024

Abstract

Purpose Articular cartilage injuries pose significant challenges for regenerative medicine, necessitating the development of innovative cell-free strategies. Hydrogels have emerged as promising biomaterials for cartilage repair, as they facilitate tissue remodelling. The present study investigates the carboxymethyl cellulose (CMC) hydrogels as a potential solution for repairing articular cartilage using a defect in an animal model.

Methods CMC hydrogels were carefully cross-linked with citric acid to enhance their mechanical properties, ensuring structural integrity during implantation. In vitro cytotoxicity and in vivo subcutaneous implantation studies were conducted to assess biocompatibility. Full-thickness chondral defects accompanied by subchondral bone injury were created in the trochlear groove of rat knees. The hydrogels were implanted into these defects, and histological evaluation was performed using haematoxylin and eosin (H&E) and safranin O staining.

Results The CMC hydrogels demonstrated excellent biocompatibility in both in vitro and in vivo studies. In vivo experiments revealed partial cartilage restoration within a month, with complete restoration observed after 3 months. Histological analysis confirmed the presence of comparable morphological features between the regenerated tissue and native cartilage, including the deposition of glycosaminoglycans.

Conclusion The findings suggest that CMC hydrogels are a promising biomaterial for repairing articular cartilage defects. Their biocompatibility, mechanical properties, and ability to facilitate tissue regeneration make them a potential therapeutic option for patients with cartilage injuries.

Lay Summary Cartilage injuries can be difficult to regenerate by itself. This study has developed a new material called cross-linked carboxymethyl cellulose (CMC) hydrogel that shows promise for repairing damaged cartilage. The hydrogels were found to be biocompatible and effective in promoting tissue growth. The CMC hydrogels were successfully used to regenerate cartilage in rats. This research suggests that CMC hydrogels may be a promising therapeutic option for patients with cartilage injuries.

Future Perspective While the results of this study are encouraging, further research is needed to confirm the long-term efficacy of CMC hydrogels in large animal model. Future studies may also explore ways to improve the hydrogel's properties.

Keywords Animal model · Articular cartilage defect · Biochemical analysis · Carboxymethyl cellulose · Hydrogels · Proof-of-concept study

✉ Inderchand Manjubala
i.manjubala@vit.ac.in

[1] Department of Bio-Sciences, School of Bio Sciences and Technology, Vellore Institute of Technology, Vellore 632014, India

[2] Pushpagiri Research Center, Pushpagiri Institute of Medical Sciences & Research Center, Thiruvalla, Kerala 689101, India

[3] Centre for Academic and Research Excellence (CARE), CSIR-Central Leather Research Institute, Chennai 600020, India

[4] Department of Manufacturing Engineering, School of Mechanical Engineering, Vellore Institute of Technology, Vellore 632014, India

Published online: 17 January 2025

Springer

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i.manjubala@vit.ac.in

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[3] Centre for Academic and Research Excellence (CARE), CSIR-Central Leather Research Institute, Chennai 600020, India

[4] Department of Manufacturing Engineering, School of Mechanical Engineering, Vellore Institute of Technology, Vellore 632014, India

Published online: 17 January 2025

Springer

BOOK CHAPTER

Microgreens: A Novel Source of Functional Nutraceuticals

Chapter | First Online: 18 January 2025
pp 87–101 Cite this chapter

Recent Trends and Applications of Leguminous Microgreens as Functional F

Sasidharan Krupa, Yogesh Bharat Dalvi, Veeramani Aranganathan & Ruby Varghese

Abstract

Diet and lifestyle are the two most pervasive constituents that influence escalating noncommunicable

Microgreens: A Novel Source of Functional Nutraceuticals

Sasidharan Krupa, Yogesh Bharat Dalvi, Veeramani Aranganathan, and Ruby Varghese

Abbreviation

NCD Non Communicable Diseases

1 Introduction

Over the past 10 years, there has been a global increase in people's desire to consume fresh, healthful, and functional foods like microgreens and sprouted seeds, particularly during and after the COVID-19 epidemic. Beyond basic nutrition, a wide variety of foods or their ingredients can be classified as functional foods or natural health benefit products due to their diversity of bioactive components that successfully promote health and prevent diseases (Butkutė et al. 2018). Legume seeds and their sprouted products, which include high levels of protein, carbs, minerals, and other health-promoting phytonutrients, are known for their multifaceted qualities. Consumer interest in microgreens has increased, particularly among high-end restaurant chefs who utilize a variety of microgreens as garnishes to improve salads, soups, sandwiches, and other culinary enhancements (Kyriacou et al. 2016; Lone and Pandey 2024). Vegans who are cautious about consuming foods use microgreens as a source of raw foods. They are young, immature plants that are

S. Krupa · V. Aranganathan · R. Varghese (✉)
Department of Chemistry and Biochemistry, School of Sciences, Jain Deemed to be University, Bengaluru, Karnataka, India

Y. B. Dalvi
Pushpagiri Research Centre, Pushpagiri Institute of Medical Sciences and Research Centre, Thiruvalla, Kerala, India

P. Mathur, A. Gupta (eds.), *Recent Trends and Applications of Leguminous Microgreens as Functional Foods*, https://doi.org/10.1007/978-3-031-75678-8_5

Promotion

Dr.Aniket Naha

Department of Research Centre

Promoted to Sr.Scientific Research Officer from 1st January 2025.

Dr. Yogesh B Dalvi

Department of Research Centre

Promoted to Lab Supervisor from 1st January 2025.

Dr.Soumya R S

Department of Research Centre

Promoted to Sr.Scientific Research Officer from 1st January 2025.