



PUSHPAGIRI RESEARCH CENTRE UPDATES

COLLABORATIVE MEETING BETWEEN SANTHIGIRI SCIENTIFIC AND INDUSTRIAL RESEARCH INSTITUTE (SSIRI) AND PUSHPAGIRI RESEARCH CENTRE

A collaborative meeting between the Santhigiri Scientific and Industrial Research Institute (SSIRI), Trivandrum, and the Pushpagiri Research Centre (PRC) was held on 14th November 2025 at 11:00 AM to explore potential areas of joint research and future partnership opportunities.

Representatives from SSIRI and Cellupro included:

- Dr. R. Sindhu, Research Director & Chief Scientist, SSIRI
- Dr. Reshmy R., Managing Director, Cellupro
- Dr. Remyaprabha Jnana Thapaswani, Santhigiri Ayurveda Medical College, Palakkad

Faculty members from Pushpagiri Research Centre also participated in the discussions, contributing insights from their respective research domains.

The meeting involved a detailed exchange of institutional strengths, ongoing research activities, and areas of potential collaboration. Discussions focused on identifying mutually beneficial research opportunities integrating modern scientific methodologies with traditional healthcare systems and natural product-based formulations.

Key areas explored included:

- Collaborative research in natural product development, Siddha-based formulations, and biomedical sciences.
- Possibilities for joint publications, technology development, and translational research with clinical relevance.
- Establishing mechanisms for continued communication, proposal development, and future institutional-level agreements.

Both institutions expressed a positive interest in moving forward with the collaboration. The discussion concluded with an agreement to develop a structured proposal outlining the scope, objectives, and operational framework for future joint research initiatives through MoU.



PRC FACULTY ATTEND TRAINING ON 3D BIOPRINTING AT MG UNIVERSITY

Dr. Nebu George Thomas and Dr. A.N. Ampadi from Pushpagiri Research Centre attended a specialized training program on 3D Bioprinting held at Mahatma Gandhi University, Kottayam.

The training offered hands-on exposure to advanced bioprinting technologies, biomaterial preparation, and emerging applications in tissue engineering and regenerative medicine. Following the session, they interacted with Dr. Sreekala, Director of the MG University Nanoscience and Nanotechnology Centre. The participation of PRC faculty reflects the Centre's commitment to staying at the forefront of cutting-edge biomedical research and expanding its capabilities in next-generation laboratory technologies.



HONORARY TITLE OF ADJUNCT LECTURER CONFERRED TO DR. SUNU ALICE CHERIAN

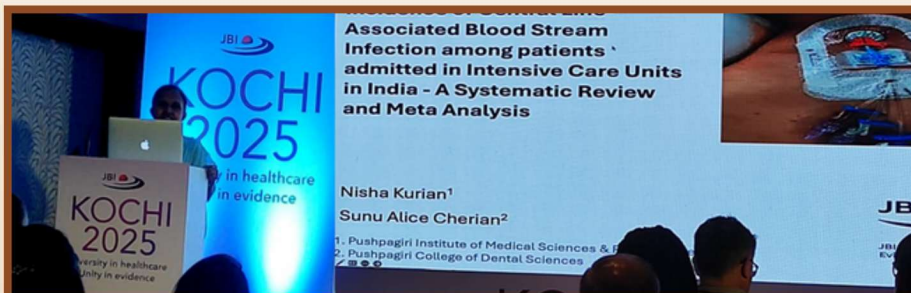
Dr. Sunu Alice Cherian has been awarded the honorary title of Adjunct Lecturer in the School of Public Health, Faculty of Health and Medical Sciences, University of Adelaide.

This prestigious recognition was conferred in acknowledgment of her significant contributions to the Pushpagiri Centre for Evidence-Based Practice (PCEBP) – a JBI Centre of Excellence affiliated with the University of Adelaide. Her continued efforts in advancing evidence-based healthcare, training, and scholarly activities have been instrumental in strengthening the Centre's academic and collaborative engagements.



74TH JBI C MEETING & JBI COLLOQUIUM

The JBI Collaboration Meeting and Colloquium was held in Kochi from November 15–21, 2025, bringing together approximately 200+ delegates from around the world. Mrs. Nisha Kurian (Director), Dr. Sunu Alice Cherian (Deputy Director), and Sr Mary Jyothi OSS (Training Coordinator) attended it. Mrs. Nisha Kurian and Dr. Sunu Alice Cherian delivered oral and poster presentations.



The dissemination conference for the JBI Grant-in-Aid project, by Adelaide University, Australia "JBI Strategies: Bridging Evidence and Practice," was successfully conducted on November 15, 2025. The event brought together healthcare professionals from the medical, dental and nursing disciplines to celebrate the completion of a comprehensive evidence implementation initiative.

The highlight of the conference was the presence of two JBI Implementation Science faculty members from the Faculty of Health and Medical Sciences, University of Adelaide, Australia: Ms Alexa McArthur and Dr Lucylynn Lizarondo. They delivered classes on Evidence Implementation, JBI education, tools and resources and shared evidence-based approaches to improving healthcare practice. They also presented JBI Evidence Implementation Training Program certificates to the project team members.

Dr. Elizabeth Joseph, Principal of Believers Church Medical College was the chief guest, Rev. Dr. Mathew Mazhavancheril, Chairman of Pushpagiri Research Council delivered the welcome speech and Rev Dr Biju Varghese Payyampallil presented mementos to dignitaries during the inauguration of the conference. Also, Dr Elsheba Mathew, the founder director of PCEBP was honoured.

Dr. Sunu Alice Cherian, Lead of the project presented the comprehensive findings, which encompassed three major research components: 1. Primary Study- "Incidence of Central Line-Associated Blood Stream Infection in Patients Admitted to Critical Care Units at Three Centres in Kerala: A Cross-Sectional Study". 2. Systematic Review - "Incidence of Central Line-Associated Blood Stream Infection among Patients Admitted in Intensive Care Units in India: A Systematic Review and Meta-Analysis". 3. Implementation Study "Central Venous Access Device Management in Critical Care Units: A Multicentric Implementation Project in Low-Resource Settings". The project team members also shared their experience. Dr Anupam S Thomas, Senior Resident, Critical Care Unit of PIMS& RC presented the findings of another implementation project done in the CCU on delirium management. The conference ended with closing remarks and vote of thanks by Nisha Kurian, director, PCEBP



Project team with Chief Guest, CEO, Director and JBI faculty- Adelaide University

BEST ORAL PRESENTATION AWARD AT INTERNATIONAL DRUG DISCOVERY SUMMIT

Ms. Elizabeth Annie George, Ph.D. scholar under the supervision of Dr. Aniket Naha, Scientist, PRC, has been awarded the Best Oral Presentation Award at the International Conference cum Workshop on the Global Summit on Innovative Drug Design, Discovery, and Translational Research, held from October 29–31, 2025 at Pondicherry University.

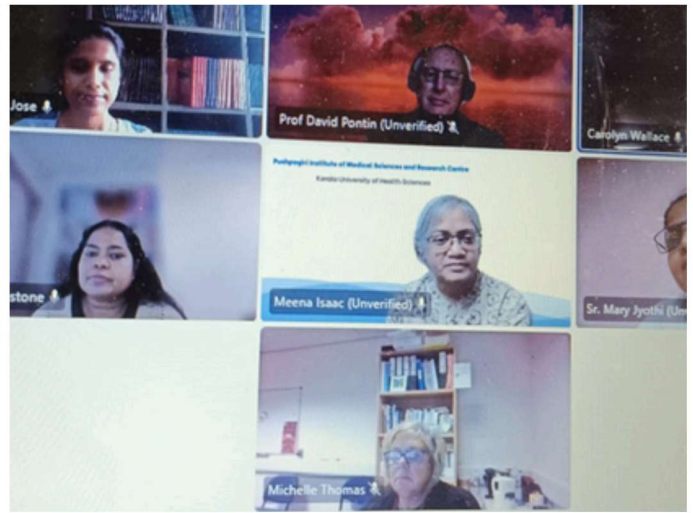
She presented her innovative research titled: "Novel HFIAP-1 Mutant Antimicrobial Peptide as a Potential β -Lactamase Inhibitor Against Extended-Spectrum β -Lactamase developing peptide-based inhibitors to combat antimicrobial resistance, addressing a major global health challenge.



As part of the ongoing Family Resilience Assessment and Intervention Tool (FRAIT) collaboration between the University of South Wales (USW) and Pushpagiri Research Centre (PRC), two online review meetings were conducted on 4th November 2025 and 27th November 2025 to assess progress and plan upcoming phases of the study.

During the first meeting on 4 November, the team discussed the emerging findings from the Group Concept Mapping (GCM) study, which was carried out with the participation of Anganwadi workers from Pathanamthitta district. The session provided an overview of the key themes identified so far and reflected on how these insights contribute to understanding family resilience within the local context.

The follow-up meeting on 27th November focused on planning the next steps of the project, including the development of the assessment tool and the preparation of associated training materials. Both meetings helped consolidate the study's progress and ensured alignment between the collaborating teams as the project moves into its upcoming phases.



IAEC MEETING SCHEDULED ON 13TH DECEMBER 2025

The Institutional Animal Ethics Committee (IAEC) of Pushpagiri Institute of Medical Sciences & Research Centre will convene its next meeting on Saturday, 13th December 2025, from 9:30 AM onwards at the Conference Hall, Pushpagiri Research Centre. The meeting will review new and ongoing research proposals involving laboratory animals from various departments and collaborating institutions.

PATENT GRANTED FOR INNOVATION

A patent has been granted for the invention titled “Anti-Microbial Effect of Catechin Doped Bioactive Glass Nanoparticle” (Patent No. 572988, filed on 12 June 2024).

Patentees: Dr. Sheena S. Raj, Dr. Emil George, Dr. Nebu George Thomas (Scientist, PRC), and Dr. A. Devadathan.

The patented work introduces bioactive glass nanoparticles enhanced with catechin, offering significant antimicrobial potential. Pushpagiri Research Centre congratulates the inventors on this notable achievement.





Oral health disparities among children with special healthcare needs: a comparative cross-sectional study

R. A. Rajeevan¹ · K. Aparna² · M. G. Elenjickal³ · T. G. Valliaveetil¹ · E. Joseph² · J. John² · R. G. Varghese⁴ · R. Kunnaiah⁵ · S. Naik⁶ · S. Vellappally⁷ · A. A. Abdulah Al kheraif⁶ · A. K. John¹ · N. G. Thomas^{8,10} · W. Saleh Al Harbi⁶ · G. Schmalz⁹ · A. Chopra^{8,9}

Received: 9 September 2025 / Accepted: 5 November 2025
© The Author(s) 2025

Abstract

Purpose Children with special healthcare needs (SHCN) often experience poorer oral health due to limitations in self-care, behavioral challenges, medical conditions, and reduced access to specialized dental services. This study aimed to assess and compare oral health behaviors, risk factors, and caries experience between children with SHCN and healthy controls, and to identify predictors of poor oral health outcomes.

Method In this cross-sectional study, 300 children (150 SHCN, 150 controls) underwent clinical examinations. Caries experience was assessed using the decayed, missing, and filled teeth (dmf/DMFT) indices, while oral hygiene status was evaluated with the Plaque Index and Gingival Index. Occlusal characteristics, dental trauma, and oral habits were also recorded. Behavioral assessment was performed using the Frankl Behavior Rating Scale (FBRS).

Results Children with SHCN demonstrated higher resistance to toothbrushing (42.7% vs. 6.7%, $p=0.001$), more frequent swallowing of toothpaste (32.0% vs. 0%, $p=0.001$), and a greater prevalence of habits such as mouth breathing (30.7% vs. 8.7%, $p=0.001$). Interestingly, the control group showed significantly higher mean dmft scores (5.07 ± 3.56) compared to SHCN children (2.64 ± 4.22 , $p=0.001$). Regression analysis identified group ($B=2.44$, $p<0.001$) and age ($B=-0.125$, $p=0.002$) as significant predictors, explaining 12.2% of the variance. SHCN children exhibited distinct behavioral risk factors, while younger age was associated with higher caries experience.

Conclusion Children with SHCN exhibited significantly poorer oral health behaviors, including resistance to brushing, swallowing toothpaste, and abnormal oral habits, compared to controls. Interestingly, despite these behavioral disadvantages, caries experience was higher in the control group, underscoring the multifactorial and complex nature of caries development. Group type and age emerged as significant predictors of dmft.

1. Rajeevan RA, Aparna K, Elenjickal MG, Valliaveetil TG, Joseph E, John J, et al. Oral health disparities among children with special healthcare needs: a comparative cross-sectional study. *Eur Arch Paediatr Dent*. 2025 Nov 14.

ORIGINAL ARTICLE

5-Aminoimidazole-4-carboxamide-1- β -D-ribofuranoside ameliorates lipotoxicity through enhanced reticulophagy in HepG2 cells

Ajay Krishnan U^{1,2} | Anuradha Carani Venkataraman¹ | Vidhya Ramachandran¹

¹Department of Biochemistry and Biotechnology, Faculty of Science, Annamalai University, Annamalai Nagar, Tamil Nadu, India | ²Pushpagiri Research Centre, Pushpagiri Institute of Medical Sciences and Research Centre, Thiruvalla, Kerala, India

Correspondence: Ajay Krishnan U (ajaykrishnanu@gmail.com)

Received: 31 January 2025 | Accepted: 30 October 2025

Keywords: AICAR | apoptosis | autophagy | lipotoxicity | NAFLD | palmitate | reticulophagy

ABSTRACT

Non-alcoholic fatty liver disease (NAFLD) is a chronic liver disease arising from the accumulation of lipids in the liver. Autophagy is an organized form of intracellular degradation process that eliminates damaged organelles and proteins. Reticulophagy (ER-phagy) is a selective type of autophagy in which a portion of the endoplasmic reticulum (ER) is sequestered and degraded within an autophagosome. ER-phagy is triggered by excessive ER-associated degradation levels resulting from an increased load of misfolded proteins. FAM134B has been identified as a mammalian ER-phagy receptor. Dysregulation of autophagy plays a crucial role in the progression of NAFLD. 5'-Adenosine monophosphate-activated protein kinase (AMPK), an energy sensor molecule, is downregulated in NAFLD and other metabolic diseases. Given the potential relationship between AMPK activation and autophagy induction, we investigated whether AMPK activation could ameliorate steatosis by inducing autophagy. In this study, palmitate (PA) was used to induce steatosis in HepG2 cells, and AMPK activation was studied using 5-aminimidazole-4-carboxamide-1- β -D-ribofuranoside (AICAR). PA treatment of HepG2 cells decreased cell viability and mitochondrial membrane potential (MMP) and increased the generation of reactive oxygen species (ROS), thereby leading to the accumulation of lipids. The mRNA expression of autophagy proteins Beclin 1 and LC3B was downregulated following PA treatment. The protein expression of p-AMPK, Beclin 1, and FAM134 was downregulated, while the expression of p62 was upregulated upon PA treatment in HepG2 cells. AICAR treatment of PA-induced HepG2 cells reversed the changes induced by PA. The protective effects of AICAR in PA-induced cytotoxicity may offer new insights for improving the treatment options for NAFLD.

2. Krishnan U A, Venkataraman AC, Ramachandran V. 5-Aminoimidazole-4-carboxamide-1- β -D-ribofuranoside ameliorates lipotoxicity through enhanced reticulophagy in HepG2 cells. *Biotechnol Appl Biochem*. 2025 Nov 21;