



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

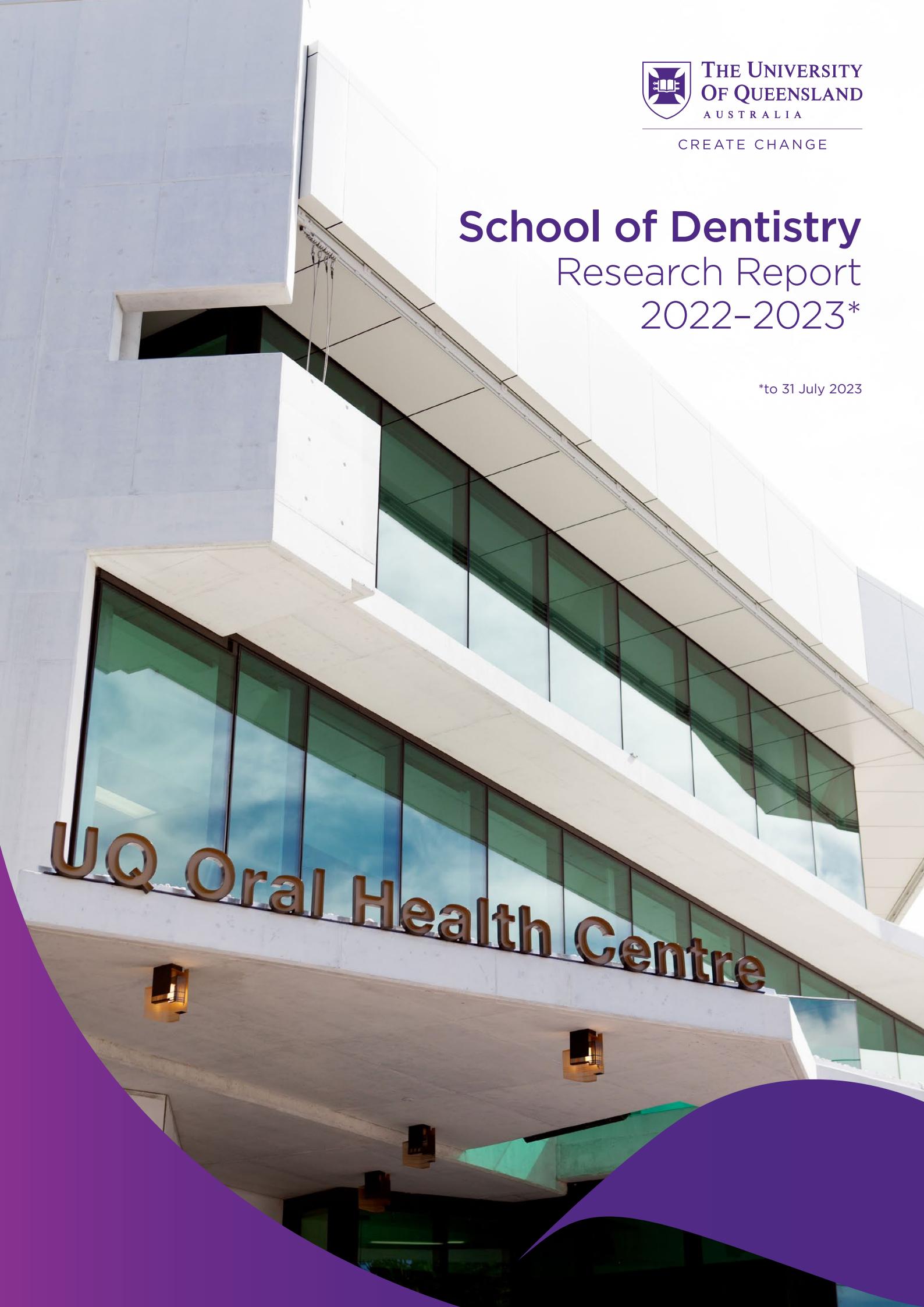
CREATE CHANGE

School of Dentistry

Research Report

2022-2023*

*to 31 July 2023



A photograph of a modern, multi-story building with a light-colored facade and large glass windows. A prominent feature is a long, illuminated sign on the side of the building that reads "UQ Oral Health Centre" in large, gold-colored letters. The building has a clean, architectural design with overhanging eaves and recessed lighting. The sky is clear and blue.

UQ Oral Health Centre



Foreword



Head of School

2023 continues to be a successful year for research output and engagement across a wide range of fields from our traditional strengths in dental public health, education and clinical practice, to exciting emerging capabilities in materials science, nanotechnology and bio-fabrication.

The school has a strong focus on translational research, emphasizing the importance of research impact on patient outcomes, as well as healthcare policy and practice.

Thanks to the hard work and commitment of our staff and students, together with the support of our local, national and international collaborators, as well as the generosity of our alumni and industry, that we are able to deliver life-changing programs that benefit the most vulnerable members of our community, support our students through their learning, and teach future dental professionals compassion and empathy.

Professor Sašo Ivanovski

Contents

Research streams	2
Research snapshot	4
Highlighted events	6
Seminar series	7
News highlights	8
Highlighted projects	9
Research groups	13
Research grants	18
Publications	20
Postgraduate research	28
Undergraduate research	30
Research Day 2023	31
Research staff	32



Director of Research

I am very pleased to see the School's growth & establishment across a variety of research fields in 2022 and 2023. The School has reinforced its position as one of the top dental schools in Australia, and one of the top 100 in the world. I am pleased to lead the next phase as we build on past successes.

The School of Dentistry is at the forefront of innovation in regenerative dentistry, craniofacial reconstruction and orofacial rehabilitation, population oral health research, as well as clinical translation.

Located within the Oral Health Centre at Herston, as part of the Oral Health

Alliance with Metro North Hospital and Health Service, our research is intrinsically linked to both the education and training of our current and future dental health professionals, and patient care.

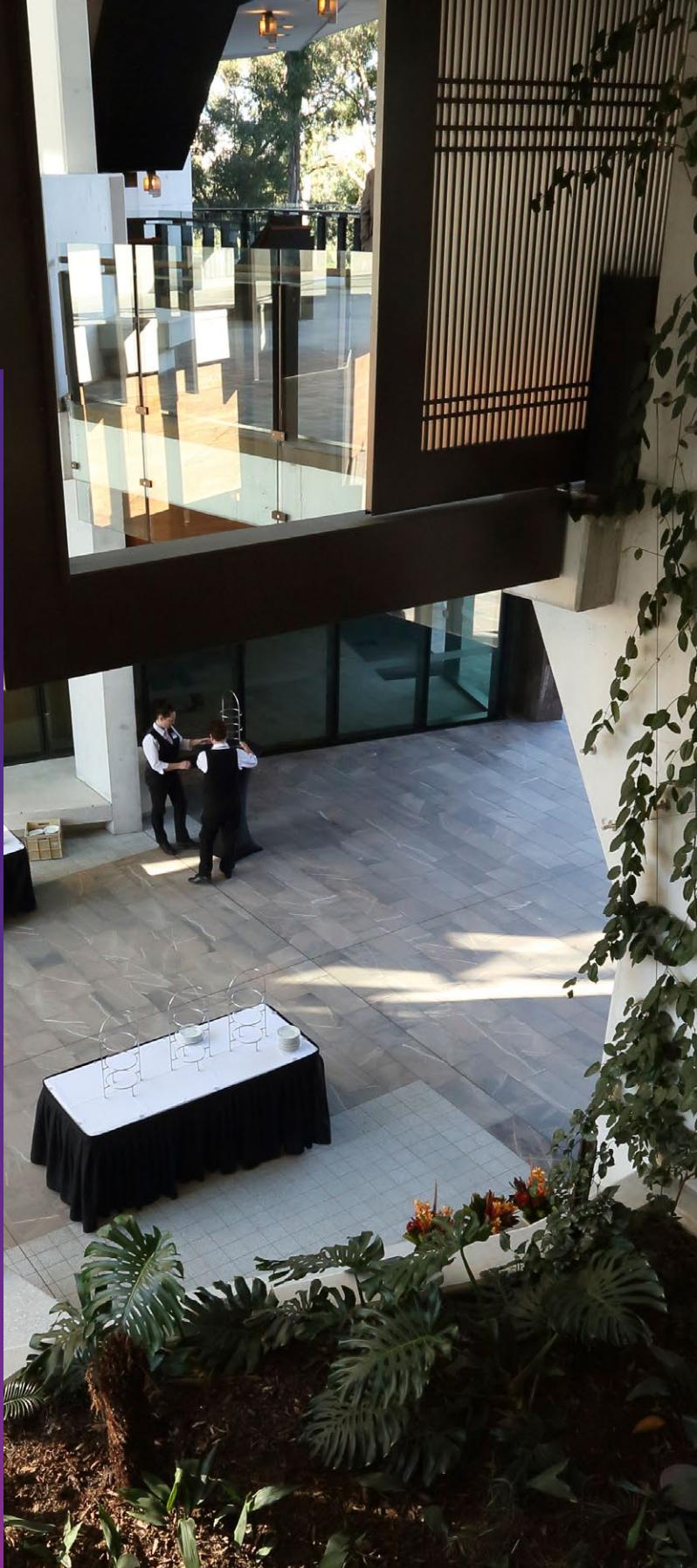
Through the complementary strengths of our expertise, knowledge and resources, we hope to create a truly world class centre of excellence, leading the way in oral health. I look forward to building on recent successes to merge scientific and clinical knowledge to improve oral health and quality of life.

Professor Loc Do

Research streams

The School of Dentistry's research is grouped under three main streams covering a wide range of areas from stem cell and tissue engineering and biological sciences through to technologies applied in clinical practice, dental public health and dental education. The School of Dentistry produces quality dental and oral health research that contributes to the advancement of scientific knowledge both locally and internationally.

The School has a demonstrated long-standing history of quality research, rated 'above world standard' in 2010 and 2012 and 'well-above world standard' in 2015 and 2018 by the Excellence in Research for Australia (ERA) rankings. We encourage translational research, emphasizing the importance of research impact on patient outcomes, as well as healthcare policy and practice.





Centre for Orofacial Regeneration, Reconstruction and Rehabilitation (COR3)

The Centre's purpose is to be a centre of excellence that advances orofacial regeneration, reconstruction and rehabilitation to improve patient outcomes through the highest quality research and education. We engage with society, industry and the profession to drive learning, innovation and discovery.



Population Oral Health at UQ (POHUQ)

The Population Oral Health research stream broadly conducts research to understand the epidemiology of health and oral ill-health and improve and enhance the oral health of communities. The stream provides scientific evidence to inform public policies and practices aiming to improve oral health of the population.



Clinical Research Unit

The purpose of these Units is to promote and facilitate clinical research activities in the School of Dentistry, The University of Queensland, and Oral Health Centre, Queensland Health Metro-North Hospital and Health Service. This is achieved through:

- Interdisciplinary cooperation and collaboration to promote evidence based dental clinical research
- Translation of 'cutting edge' pre-clinical research for clinical application (e.g. diagnostic methodology, dental devices/materials)



Research snapshot



Research funding

\$1,441,068

2022

\$1,669,219

*to 1 July 2023



Research related staff

78

2023



Publications*

197

2022



44.7%

with international
co-authors
2022

62

*to 1 July 2023

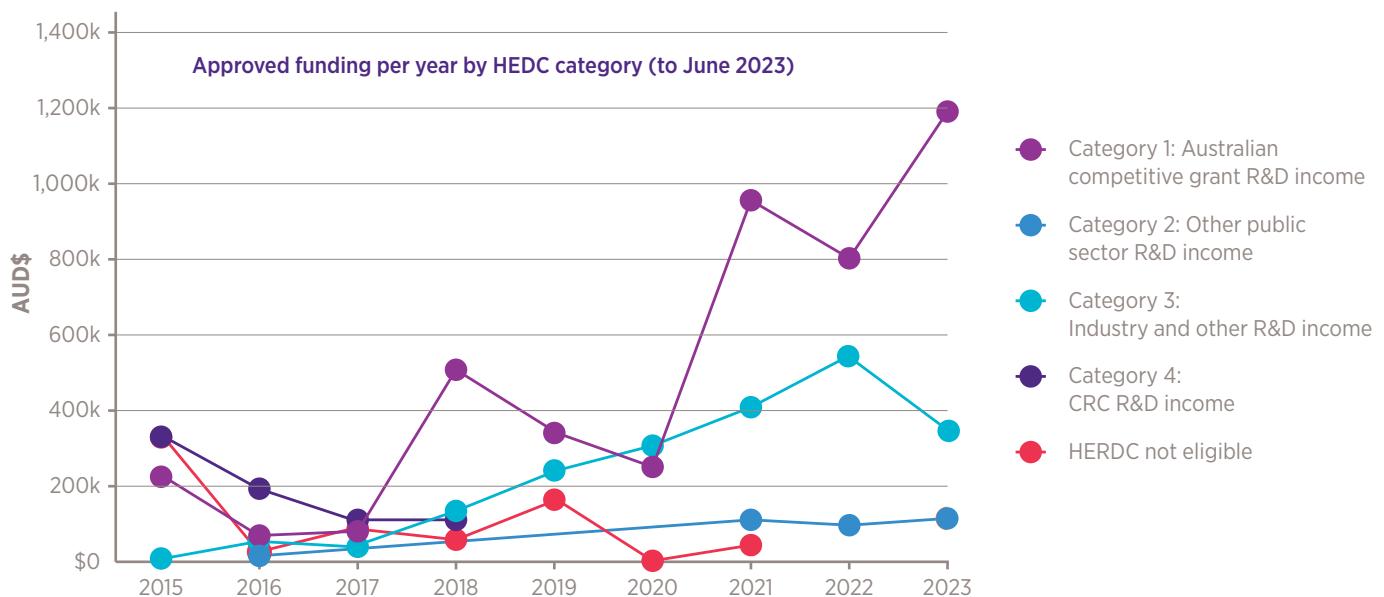


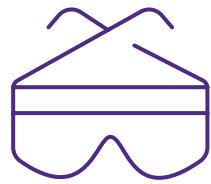
638

citations
2022

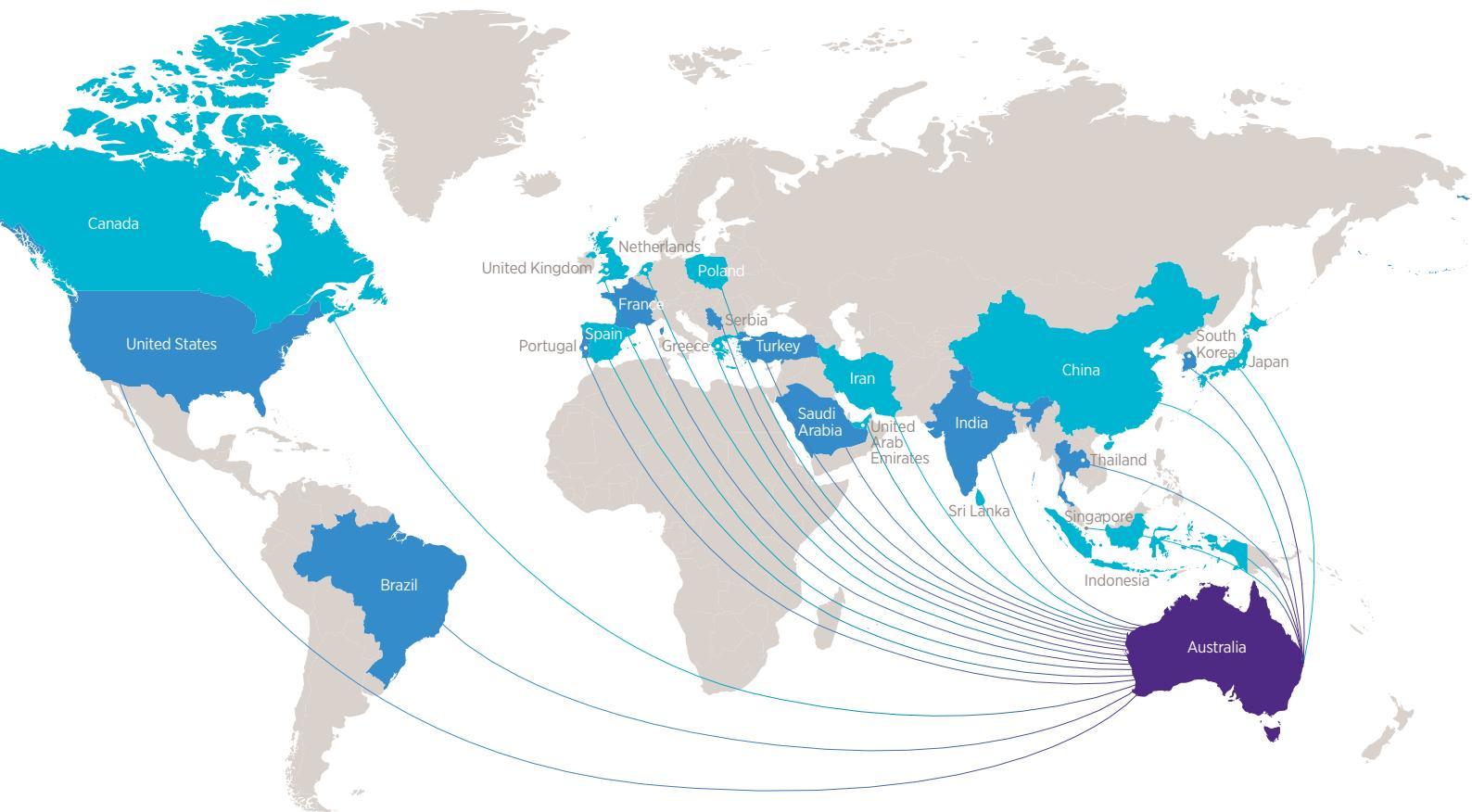
* Includes publications with the School of Dentistry listed as an affiliation, and publications where current staff were listed as an author not necessarily while they were a staff member at the School.

Grant income

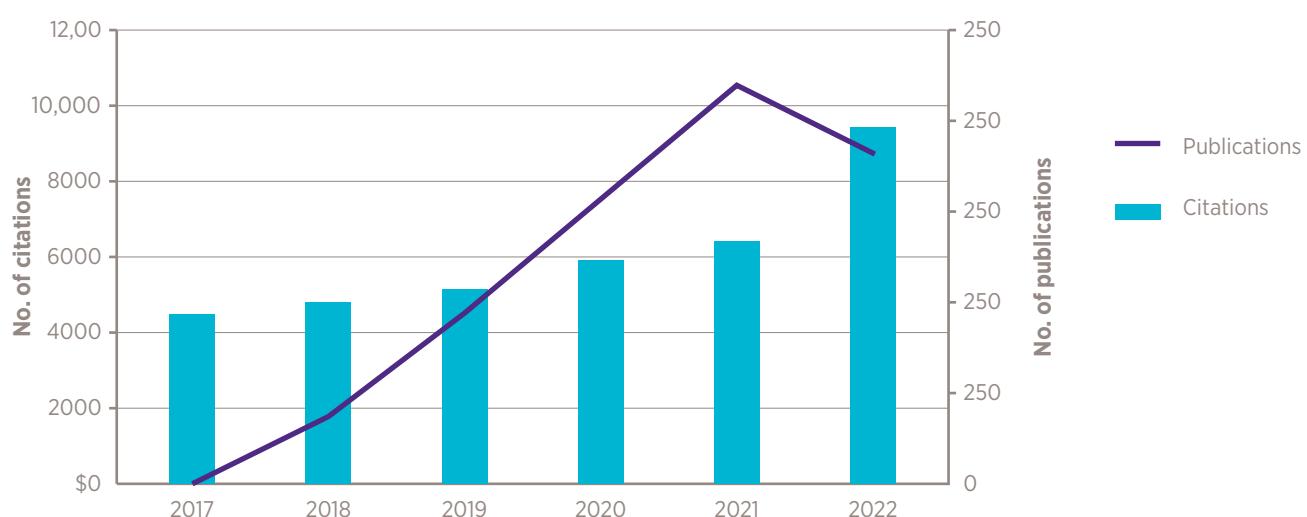




Publications and citations



Publication collaboration network



Highlighted events



UQ COR3 Regenerative Dentistry Symposium: Polymer Science and 3D Printing for Dentistry

June 2023

Dr Pingping Han facilitated future collaborations between research in the dentistry and polymer science fields. This symposium was supported by the Australia-Japan Foundation with a diverse range of international speakers.

Annual School of Dentistry – Research Day

July 2023

Showcasing innovative research from students and early career researchers. Topics ranged from regenerative dentistry and clinical translation, to public health and dental education. Over 20 presenters on the day shared their research as well as a number of journal publications.

Keynote Speakers: Professor James Ward, Director of the UQ Poche Centre for Indigenous Health; Professor Nadine Foster, Director of UQ Clinical Trials Unit and Director of STARS Research and Education Alliance.

UQ and Tohoku University: Bilateral Dentistry Research Symposium

July 2023

Dr Jaya Seneviratne facilitated this online international symposium which marks the beginning of collaborative relationships between the University of Queensland and Tohoku University, Japan.

School of Dentistry Centre of Excellence Multidisciplinary Showcase: Raising the Standards of Oral Care

July 2023

An engaging day of clinically-based presentations provided clinicians with knowledge in how to raise the standards of oral care in daily practice. Presentations included multidisciplinary aspects of Periodontics, Prosthodontics, Orthodontics, Oral Medicine, Special Needs Dentistry and Oral Maxillofacial Surgery.



Seminar series

Nanomaterials based on metal and metal oxide for theranostics of diseases

January 2023

Dr Hang Ta is a Heart Foundation Future Leader Fellow and Associate Professor at the School of Environment and Science and Queensland Micro- and Nanotechnology Centre, Griffith University.

Introducing uQOLA (UQ oral microbiomics for learning and application)

February 2023

Dr Jaya Seneviratne is an internationally recognized academic and a researcher in the field of Dentistry and is currently a Senior Lecturer in Periodontology affiliated to the School of Dentistry, University of Queensland, Australia, where he serves as Director of Higher Degree Research.

A multiscale study of bacterial biofilms. From isolated components to multicellular organisms.

March 2023

Dr Liraz Chai is Associate Professor at the School of Chemistry in the Hebrew University of Jerusalem, Israel.

Personalised medicine for osteoarthritis

April 2023

Professor David Hunter, Florance and Cope Chair of Rheumatology, Professor of Medicine, and NHMRC Leadership Investigator Fellow at the Sydney Musculoskeletal Health, Kolling Institute, University of Sydney, and Rheumatology Department Royal North Shore Hospital.

Evaluating the child dental benefits schedule

May 2023

Dr Nicole Stormon is a lecturer at The University of Queensland and AHPRA registered Oral Health Therapist. She is also the Principal Research Fellow for Queensland Health Metro North Community and Oral Health and President of ADOHTA.

Extracellular vesicles as theragnostic in periodontics

June 2023

Dr Pingping Han currently holds the position of Group Lead for Epigenetic Nanodiagnostics and Therapeutics at the Centre for Orofacial Regeneration, Reconstruction, and Rehabilitation (COR3) [#]within the School of Dentistry at The University of Queensland.

Awards

Professor Loc Do

The International Association for Dental Research (IADR) Distinguished Scientist H. Trendley Dean Memorial Award, Chengdu 2022.

Joint Award: The IADR Aubrey Sheiham Award for Distinguished Research in Dental Public Health, Bogota 2023.

Dr Diep Ha

The IADR ANZ Investigator Award in Community Dentistry, Melbourne 2022.

Joint Award: The IADR Aubrey Sheiham Award for Distinguished Research in Dental Public Health, Bogota 2023.

Dr Sobia Zafar

Young Tall Poppy Scientific Award

Dr Chun Xu

Young Tall Poppy Scientific Award

Dr George Bogen

American Association of Endodontics – President's Award Winner 2023



News highlights



DIY dentistry trends

Emeritus Professor Laurie Walsh and Associate Professor Arosha Weerakoon spoke to The House of Wellness about the dangers of some DIY dentistry trends promoted on TikTok.



House of Wellness

Imposter Syndrome

Dr Arosha Weerakoon shared tips with Colgate on how to overcome Imposter Syndrome in the industry.



Colgate



Water fluoridation

Professor Loc Do spoke to Brisbane Times about research which has found water fluoridation has no impact on children's brain development.

Brisbane Times

Gum disease

Dr Pingping Han spoke to SBS News about the importance of brushing and flossing to prevent gum disease.

SBS News



Clinician scientists

Dr Arosha Weerakoon wrote for Colgate sharing five ways to benefit as a clinician scientist.



Colgate

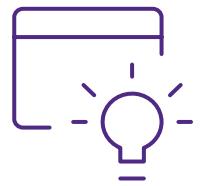
Oral health study

Professor Loc Do and Population Oral Health at UQ (POHUQ) in collaboration with Queensland Health and Queensland Education study the dental health of young Queenslanders and gathered valuable information on childhood rates of dental decay and disease, and behaviours and attitudes to oral health.



UQ News

Highlighted projects



Gallium-doped Therapeutic Titanium Dental Implants

Project investigators

Anjana Jayasree, María Natividad Gómez-Cerezo, Elise Verron, Sašo Ivanovski, Karan Gulati

Funding

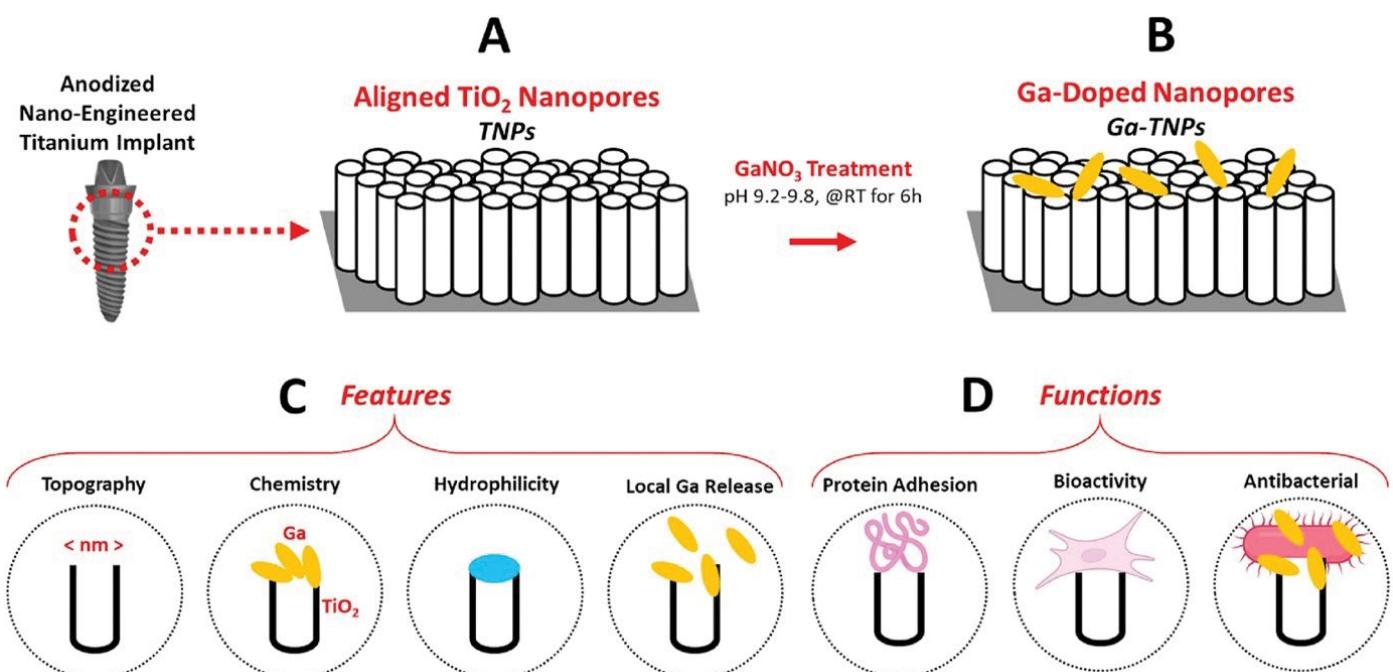
- NHMRC Early Career Fellowship
- International Team for Implantology (ITI) Research Grants 2022–23 (Basel, Switzerland)
- Australian Dental Research Foundation (ADR) Research Grants 2021–22

Project highlights

- Poor soft-tissue integration and bacterial infection are the leading cause of dental implant failure.
- Micro-rough Ti implants are anodized to fabricate TiO_2 nanopores that are modified with Ga-doping.
- Surface topographical and chemical characterisations and local release of Ga are evaluated for the modified nano-engineered implants.
- Functions of primary human gingival fibroblasts reveal enhanced soft-tissue integration abilities of the modified implant.
- Human oral salivary biofilm testing confirms significant bactericidal functions of the Ga-nanoporous implant.

Suggested reading

A. Jayasree, M.N. Gómez-Cerezo, Verron, S. Ivanovski and K. Gulati*. Gallium-doped Dual Micro-Nano Titanium Dental Implants Towards Soft-Tissue Integration and Bactericidal Functions. *Materials Today Advances* 2022, 16, 100297 [IF 10.0]. doi.org/10.1016/j.mtadv.2022.100297



Effect of early life exposure to fluoridated water and child psychological and intellectual development (Tooth for Health study)

Project investigators

Loc Do, Diep Ha

Project team

Thu Le, Rochella Janamian

Funding

Australian National Health and Medical Research Council (NHMRC) Project Grants # APP1161581 2019-22.

Chief investigators

Loc Do and Diep Ha, in collaboration with dental researchers, psychologists and statistician from University of Adelaide and University of Bristol.



Description

The overarching aim of this multidisciplinary project is to examine the relationships between early life exposure to fluoridated water and measures of child psychological and intellectual development of a national representative sample of Australian children. The current evidence suggests that levels of exposure to fluoride from water fluoridation observed in developed countries like Australia are safe for child health and development. However, the existing evidence is unclear.

There has been no large-scale population-based study that is able to examine effect of such low levels of exposure to fluoride on overall child development. The arguments about possible negative effects of fluoride on child psychological and intellectual development have made it crucial to evaluate the risk-benefit balance of this important public health program.

This study applies a prospective cohort study design for data collection to combine population-based data sources, namely the National Child Oral Health Survey 2012–2014 and postcode-level fluoride database, cognitive function, intellectual ability and social and emotional wellbeing.

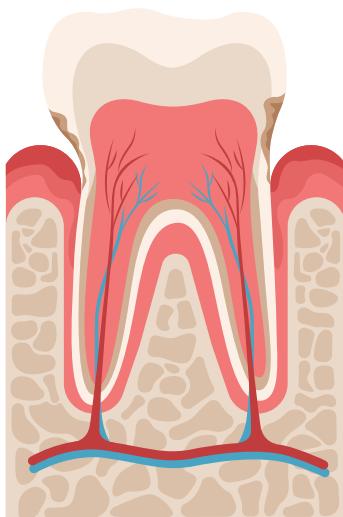
Impact and translation

Tooth for Health Study has contributed publications in high impact dental, and public health journals. Its findings have contributed to policies and practices aiming at understanding the risk and benefit balance of early life use of fluoride in preventing dental caries.

The most recent publication addresses the relationship between exposure to fluoridated water during the first five years of life and child behavioural development and executive functioning, using a sophisticated longitudinal trajectory method. Published in the top dental research journal, Journal of Dental Research (JDR), the paper has attracted worldwide attention. It has been reported by 94 international news outlets. Its Altmetric score is 734, highest among publications in JDR. It has been cited as a key publication in the Annual Report of the International Association for Dental Research (IADR).

Do LG, Spencer AJ, Sawyer A, Jones A, Leary S, Roberts R, Ha DH. Early Childhood Exposures to Fluorides and Child Behavioral Development and Executive Function: A Population-Based Longitudinal Study. *J Dent Res.* 2023;102(1):28-36. doi: 10.1177/00220345221119431.

Profiling expression levels of histone deacetylase enzymes (HDACs) in human saliva in periodontal health, gingivitis and periodontitis



Project investigators

Andrew Liaw, Chun Liu, Mark Bartold, Sašo Ivanovski, Pingping Han

Funding

Australian Dental Research Foundation (ADRF; grant number: 0036-2021) and The Australian Periodontology Research Foundation (APRF).

Description

The objective of the study was to profile the expression level of histone deacetylase enzymes (HDACs) in human saliva in periodontal health, gingivitis and periodontitis. This pilot study has demonstrated the differential expression of HDACs in human saliva for the first time and identified HDAC4, 8 and 9 as potential biomarkers in periodontal diagnosis.

Impact and translation

The research contributes to the scientific understanding of the molecular mechanisms underlying periodontal disease. It adds to the existing knowledge of how epigenetic factors, specifically histone deacetylase, might be involved in the development, progression, or severity of periodontal disease.



Contemporary evidence for water fluoridation program – a before-and-after population-based study (Queensland Child Oral Health Study)

Project investigators

Loc Do, Pauline Ford, Ratilal Laloo,
Diep Ha, Michael Foley.

Project team

Thu Le, Chris Sexton, Rochella Janamian,
Ratika Kumar.

Funding

Australian National Health and Medical Research Council (NHMRC) Ideas Grants
APP1181029 2021-26.

Chief investigators

Loc Do, Pauline Ford, Ratilal Laloo, Diep Ha,
Michael Foley, in collaboration with dental researchers from Queensland Health,
University of Adelaide, University of Otago,
and University of Cork.

Description

Concerns about the quality and timeliness of the available evidence on effectiveness and safety of water fluoridation, has been a perennial issue when health authorities need to make a recommendation on their support or otherwise for this measure. Effectiveness and suitability of water fluoridation in the contemporary context are frequently challenged, making it difficult to guide policy decision and to inform public debate. The concerns, which have recently intensified, call for contemporary high-level scientific evidence to be collected in order to better inform policy at all levels about this major public health program. However, the current paradigm presents many obstacles in the use of observational data in generating quality evidence of causal relationship between fluoridation and oral health outcomes, required to answer the call. We conduct a large population-based epidemiological study applying the accepted benchmark before-and-after non-randomised study design. Being built on the platform of the before phase, the Queensland Child Oral Health Study 2010–12 of 5,407 children (conducted at the start of water fluoridation in Qld), the after phase of this study collects comparable data on dental caries and fluorosis, health-related quality of life and socioeconomic inequalities in oral health among a representative sample of Queensland children.

Impact and translation

The study will investigate over time changes in the outcomes among children receiving water fluoridation, relative to a negative and a positive control. An innovative causal approach will be applied to design, analysis and interpretation. Its findings will contribute contemporary high-level evidence of the causal relationship between water fluoridation and oral health to inform coherent policies to support or adjust water fluoridation as a public health program. It will be the first to empirically challenge the persistent reluctance in applying causal inferential thinking to inform population oral health programs.





Research groups



Immunoengineering for regenerative dentistry

Group leader

Dr Yinghong Zhou

Group member

Dr Yuqing Mu, Ms Tian Xu, Mr Cong Wang

Funding

- UQ-Colgate Student Research Grant
- Australian Periodontology Research Foundation Research Grant
- International Team for Implantology Foundation Project Grant
- Osteology Foundation Advanced Researcher Grant
- UQ Knowledge Exchange & Translation Fund
- Q HaBS and EAIT ECR Collaboration Seed Funding Grant

Description

Our research integrates stem cell technology, osteoimmunology, biomedical engineering, and biomaterial science to achieve physical and functional restoration of dental and oral tissues.

Areas of interest include :

- Cells or cell derivatives to repair or regenerate dental tissues;
- Immunomodulation therapy harnessing immune response by biologically active molecules and biomaterials;
- In vitro modelling to mimic cellular crosstalk in periodontitis

Key publications

1. S Wang, P Wang, R Thompson, K Ostrikov, Y Xiao, Y Zhou*. Plasma-activated medium triggers immunomodulation and autophagic activity for periodontal regeneration. *Bioengineering & Translational Medicine*, 2023. 8(4):e10528.
2. T Xu, K Xie, C Wang, S Ivanovski, Y Zhou*. Immunomodulatory nanotherapeutic approaches for periodontal tissue regeneration. *Nanoscale*, 2023. 15(13):5992-6008.
3. F Wei, Y Mu, RP Tan, SG Wise, MM Bilek, Y Zhou*, Y Xiao. Osteo-immunomodulatory role of interleukin-4-immobilized plasma immersion ion implantation membranes for bone regeneration. *ACS Applied Materials & Interfaces*, 2023. 15(2): 2590-2601.
4. C Tang, J Deng, R Xu, J Li, C Yin, Y Yang, Y Zhou*, F Deng. Micro/nano-modified titanium surfaces accelerate osseointegration via Rab7-dependent mitophagy. *Biomaterials Science*, 2023. 11: 666-677.

uQOLA (UQ oral microbiomics for learning and application)

Vision

The vision of uQOLA Research Group is to develop host-microbiome modulation therapy through unravelling the molecular mechanisms underpinning oral diseases and oral-systemic link.

Group leader

Dr Jaya Seneviratne is an internationally recognized academic and researcher in the field of dentistry. He is currently a Senior Lecturer in Periodontology affiliated with the School of Dentistry at the University of Queensland, Australia, where he serves as the Director of Higher Degree Research. Dr Seneviratne's track record includes over 100 publications in reputable international journals, 12 book chapters, and an edited book titled "Microbial Biofilms: OMICS Biology, Antimicrobials, and Clinical Implications," published by Taylor & Francis CRC Press in 2017. He has also secured over AU\$6 million in competitive grants for his research and development work.

Dr Seneviratne is an editorial board member of the Journal of Dental Research and Critical Reviews in Microbiology. He serves as the Chairman of the Session Committee for the 2023/2024 IADR meetings. As an outstanding educator, he supervises both undergraduate and postgraduate students in their research, with many of his research mentees having received prestigious IADR Awards. His key research interests include oral bacterial and fungal biofilms, oral microbiome and mycobiome, and oral-systemic links.

Group members

Nadeeka Udawatte, PhD student; Sadaf Khan, visiting PhD student; Amjad Almuqrin (PhD, student); Yuzhang Li PhD student; Junya Zeng, UQ Master's students

Research focus

The oral cavity is inhabited by a multitude of microbial residents, both on teeth and oral mucosa. This symbiotic relationship between the host and microbiota is essential for maintaining oral health. However, microbial dysbiosis and a dysregulated immune-inflammatory response may lead to various oral diseases. Additionally, oral dysbiosis may also have implications in systemic diseases, such as diabetes, cardiovascular disease, and adverse pregnancy complications.

With recent technological advancements in OMICS biology and next-generation sequencing, previously unseen aspects of oral biofilm infections, new pathogenic species, and salivary biomarkers have been uncovered. At uQOLA, we aim to develop novel diagnostic platforms and therapeutic approaches to modulate the host-microbiota interaction to ensure optimal oral and systemic health.



Population Oral Health at UQ (POHUQ)

Group leader

Loc Do

Group members

- Staff: Loc Do, Diep Ha, Nicole Walker, Ratika Kumar, Laura Ferris, Michael Foley, Chris Sexton, Thu Le, Rochella Janamian, Alison Brodie.
- Students: An Dao, Nilesh Torwane, Lyndal Pritchard, Angelique Zamora.

Description

Oral health is an integral part of general health, affecting individuals, the health system and society. Oral diseases are some of the most prevalent chronic conditions and are preventable if evidence-based policies and practices are informed with quality and up-to-date data.

Population Oral Health research is a major branch of dental research, producing the essential information used by the scientific community, policymakers and dental service providers, the profession, the industry, and the public to improve the oral health of communities at national, regional and global levels.

Population Oral Health at UQ (POHUQ) is a leader in oral epidemiological and population oral health research, targeting the improvement of population oral health and reduction in inequalities in oral health. POHUQ aims to provide quality research data to inform policies and practices in improving population oral health. POHUQ is supported by four NHMRC Grants and a 5-year UQ VC Strategic Funding Support.

Impact and translation

- Do LG, Spencer AJ, Sawyer A, Jones A, Leary S, Roberts R, Ha DH. Early Childhood Exposures to Fluorides and Child Behavioral Development and Executive Function: A Population-Based Longitudinal Study. *J Dent Res.* 2023;102(1):28-36. doi: 10.1177/00220345221119431.

- Do LG, Cury J, James P, Mossey PA, Zohoori FV, Fox C, and Charles-Ayinde MKS. Position Statement on Community Water Fluoridation. International Association for Dental Research 2022. iadr.org/science-policy/position-statement-community-water-fluoridation
- Ha D, Arora A, Harford J, Luzzi L, Chrisopoulos S, Do LG. 2022. Population impact of sugar-sweetened beverages on dental caries and overweight/obesity in Australian children. *JDR Clin Trans Res.* 23800844221091701. (One of IADR 2022 Research Breakthrough papers).

Funding

- UQ VC Strategic Funding
- NHMRC Project Grants
- NHMRC Ideas Grant
- MRFF Dementia Ageing and Aged Care Mission Grant
- The Borrow Foundation, UK

Achievements

- Loc Do: Recipient of the IADR Distinguished Scientist H. Trendley Dean Memorial Award, Chengdu 2022
- Diep Ha: Recipient of the IADR ANZ Investigator Award in Preventive and Community Dentistry, Melbourne 2022
- Loc Do and Diep Ha: joint recipients of the IADR Aubrey Sheiham Award for Distinguished Research in Dental Public Health, Bogota 2023

Collaborations

- University of Adelaide
- Curtin University
- Flinders University
- University of Western Sydney
- University of Melbourne
- University of Otago, New Zealand
- University of Bristol, UK
- University of Cork, Ireland

Ongoing projects

1. Determinants of inequality in child oral health at school age – A prospective cohort study (The SMILE study)
Project investigators: Loc Do, Diep Ha.
Project team: Thu Le, Rochella Janamian.
Funding: NHMRC Project Grants
APP1046219 2013-17 and APP144595 2018-22

2. Effect of early life exposure to fluoridated water and child psychological and intellectual development (Tooth for Health Study)
Project investigators: Loc Do, Diep Ha.
Project team: Thu Le, Rochella Janamian.
Funding: NHMRC Project Grants
APP1161581 2019-22.

3. Contemporary evidence of the effectiveness and safety of water fluoridation (the Queensland Child Oral Health Study)
Project investigators: Loc Do, Pauline Ford, Ratilal Laloo, Diep Ha, Michael Foley.
Project team: Thu Le, Rochella Janamian.
Funding: NHMRC Ideas Grants
APP1181029 2021-25.

Scan QR code for media activity.



4. Oral Health in Aged Care: Addressing Oral Health Inequity and Unmet Dental Care Needs in Vulnerable Populations

Project investigators: Loc Do, Matthew Nangle, Claudia Lopez-Silva, Nicole Walker, Diep Ha, Sašo Ivanovski, Nicole Stormon, Christopher Sexton, Laurence Walsh.
Project team: Laura Ferris, Alison Brodie.
Funding: NHMRC 2022 MRFF Dementia Ageing and Aged Care Mission Grant # 2024439.

Epigenetic nanodiagnostics and therapeutics

Group leader

Dr Pingping Han

Group members

Ms Chun Liu (PhD), Ms Negar Yazdani (PhD),
Dr Soojin Lim (MPhil), Ms Kexin Jiao (MPhil)

Description

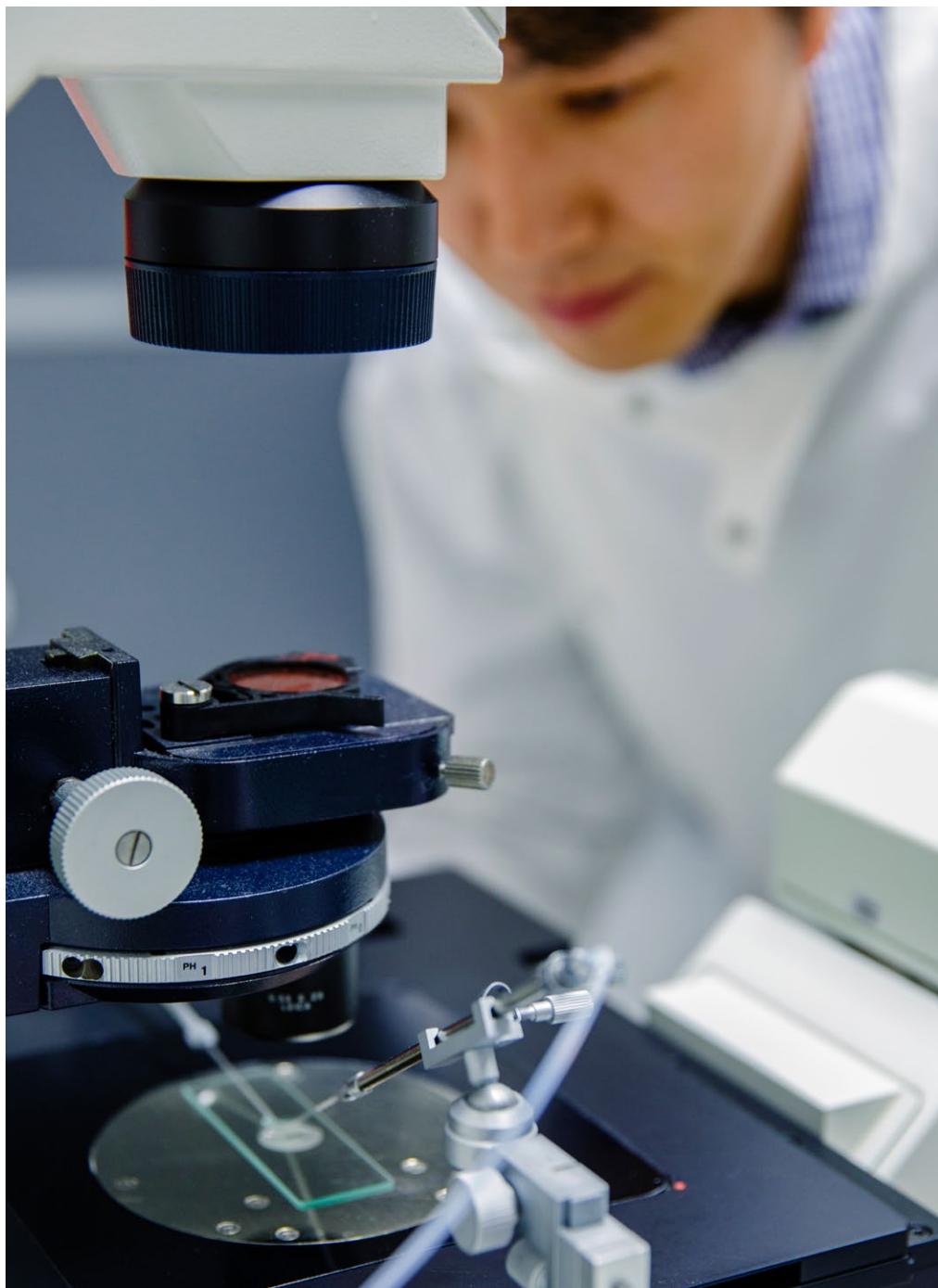
Extracellular vesicles (EVs) are lipid-based membrane vesicles, released by all cells, both healthy and diseased. They are emerging as a liquid biopsy for diagnostics and 'cell-free' therapeutics for various diseases, due to their molecular cargos' facilitation of cell-cell communication. There are two themes for EVs' application in periodontal disease management: a) salivary epigenetic nano-diagnostics using EVs; and b) EVs as 'cell-free' therapeutics for periodontal regeneration. Furthermore, our group is also working on cellular nano-mechanics on different modified titanium surfaces, by investigating how cells sense the surface via mechanotransduction pathway.

Key publications (2023)

1. Liaw, Andrew, Liu, Chun, Bartold, Mark, Ivanovski, Sašo and Han, Pingping (2023). Salivary histone deacetylase in periodontal disease: a cross-sectional pilot study. *Journal of Periodontal Research*, 58 (2), 1-11. doi: 10.1111/jre.13104 (IF 3.5)
2. Han, Pingping, Johnson, Nigel, Abdal-Hay, Abdalla, Moran, Corey S., Salomon, Carlos and Ivanovski, Sašo (2023). Effects of periodontal cells-derived extracellular vesicles on mesenchymal stromal cell function. *Journal of Periodontal Research*. doi: 10.1111/jre.13171 (IF 3.5)
3. Han, Pingping, Jiao, Kexin, Moran, Corey S., Liaw, Andrew, Zhou, Yinghong, Salomon, Carlos and Ivanovski, Sašo (2023). TNF- α and OSX mRNA of salivary small extracellular vesicles in periodontitis: a pilot study. *Tissue Engineering. Part C. Methods*, 29 (7), 298-306. doi:10.1089/ten.tec.2023.0051 (IF 3.0)
4. Han, Pingping, Guo, Tianqi, Jayasree, Anjana, Gomez, Guillermo A., Gulati, Karan and Ivanovski, Sašo (2023). Tunable nano-engineered anisotropic surface for enhanced mechanotransduction and soft-tissue integration. *Nano Research*, 16 (5), 7293-7303. doi: 10.1007/s12274-023-5379-y (IF 9.9)
5. Han, Pingping and Ivanovski, Sašo (2023). 3D bioprinted extracellular vesicles for tissue engineering – a perspective. *Biofabrication*, 15 (1) 013001, 1-13. doi: 10.1088/1758-5090/ac9809 (IF 9.0)

Impact

- Our saliva diagnosis research has implications for dental and medical professionals. A significant correlation between salivary markers levels and periodontal disease, it could lead to a paradigm shift in diagnostic approaches.
- This therapeutic potential of exosomes paper contributes to our understanding of intercellular communication within the oral environment, specifically focusing on the interaction between periodontal cells and MSCs through extracellular vesicles. By elucidating the effects of these EVs on MSC function, the study could provide insights into previously unexplored mechanisms of cellular crosstalk.



Clinical research – Endodontology

Group leaders

Ove Peters

Group member (Staff)

Christine Peters, Trish Wright,
Unni Krishnan, Sepanta Hosseinpour

Students

Farzaneh Afkhami (PhD), Philip Chien
(MPhil), Yasmen Alfaaisal (MPhil), Richard
Huynh (MPhil), Helen McHugh (DClinDent),
Georgina Marshall (DClinDent),
Wai-Sze (Cece) Chan (DClinDent), Kush Ohri
(DClinDent), Jasmine Holgate (DClinDent),
Konna Chakravarty (DClinDent)



Description

Clinical research in endodontics is currently directed towards vital pulp treatment (VPT), an underused modality. The expectation is that more complex molar root canal treatment may in many cases be replaced by VPT. It is clear that private practitioners are apprehensive when patients in pain need to be seen. Clinical endodontics is still challenged by false perceptions, in part related to less than ideal clinical quality. Clinical research in our group is supported by extensive laboratory-based research into tooth fracture mechanics as well root canal instrumentation and irrigation.

In our clinical study we are looking to improve the diagnostic pathway that can generate good outcomes with painful molars. Similarly, other studies by group members are estimating the number of patients that may benefit from VPT and looking into stress factors among various types of practitioners.

Funding for the Endodontic Research Group comes from sources that include MetroNorth HHS and internal funding.

Impact and translation

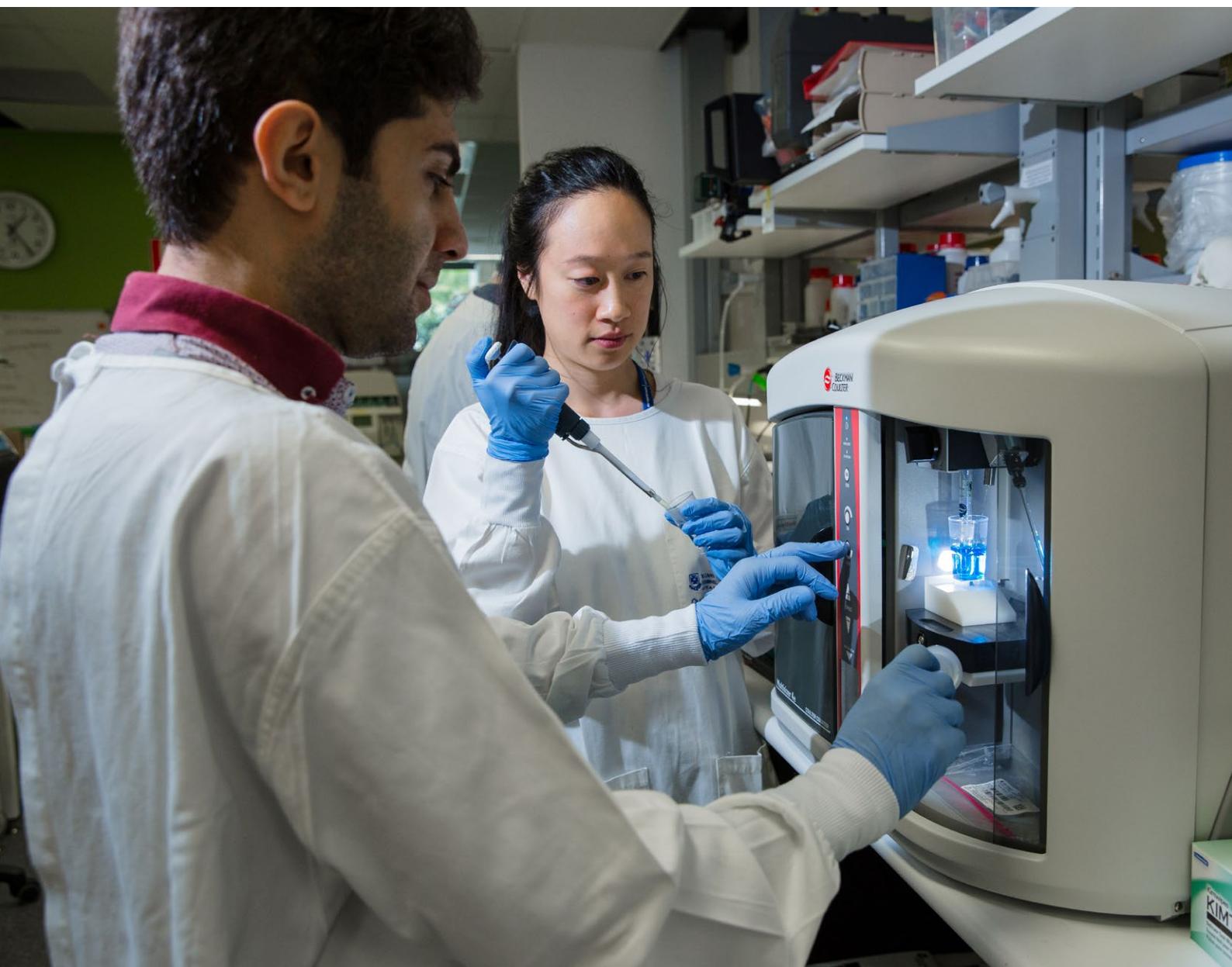
Our group is specifically active in guideline development both in Australia and internationally.

The development of European Society of Endodontontology S3-level guidelines for the treatment of pulpal and apical disease. Duncan HF et al (Peters OA). *Int Endod J.* 2021 May; 54(5):643-645.

AAE Position Statement on Vital Pulp Therapy.

Hirshberg C et al (Peters OA) *J Endod.* 2021 Sep;47(9):1340-1344

Revised guidelines for the endodontic education of dentistry students in Australia and New Zealand. Sadr A et al (Peters OA) *Aust Endod J.* 2021 Aug;47(2):327-331.





Anodised therapies for osseointegration, regeneration and stimulation (GATORs)

Leader

Dr Karan Gulati

Group members

Anjana Jayasree, Divya Chopra

Description

Our research focuses on nano-engineering of dental implants to enable local drug release and enhanced bioactivity, targeting dental implant failure, especially associated with ongoing conditions (osteoporosis, diabetes, aged patients and smokers). Electrochemical anodization imparts controlled nanotopography to conventional dental implants to augment osseointegration and achieve immunomodulation and antibacterial functions via tailored local therapies. The technology translates well into all metal implants (Ti, Zr, alloys, etc.) and orthopaedic implants. Dr Gulati's GATORs group aligns well with the vision of the COR3 group: novel dental solutions towards regeneration, reconstruction and rehabilitation. The technologies and strategies employed in the GATORs group are cost-effective and scalable, ensuring clinical translation.

Grants/awards

- Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowship 2022
- IADR GC Centennial Research Award 2022 by International Association for Dental Research (IADR)
- International Team for Implantology (ITI) Research Grants 2022–23 (Basel, Switzerland)
- Australian Dental Research Foundation (ADRF) Research Grants 2021–22
- UQ Dentistry: HDR Supervision (Runner Up), Best Paper, IADR Travel Grant 2021–23

Collaborations

- Kyoto University, Japan
- University of Nantes, France
- University of Manchester, UK
- TUM, Munich, Germany
- University of Paris, France
- Peking University, China
- Indian Institute of Technology, Delhi, India

Key publications

- Book 'Surface Modification of Titanium Dental Implants' in Springer Nature Switzerland AG. 2023. ed. by K. Gulati. doi.org/10.1007/978-3-031-21565-0

- K. Gulati*, D. Chopra, N.A. Kocak-Oztug and E. Verron. Fit and Forget: The Future of Dental Implant Therapy Via Nanotechnology. Advanced Drug Delivery Reviews 2023, 199, 114900. [IF 16.1]. doi.org/10.1016/j.addr.2023.114900
- D. Chopra, A. Jayasree, T. Guo, K. Gulati* and S. Ivanovski*. Random, Aligned and Grassy: Bioactivity and Biofilm Analysis of Zirconia Nanostructures as Dental Implant Modification. Composites Part B: Engineering 2023, 259, 110725. [IF 13.1]. doi.org/10.1016/j.compositesb.2023.110725
- D. Chopra, T. Guo, S. Ivanovski* and K. Gulati*. Single-Step Nano-Engineering of Multiple Micro-Rough Metals via Anodization. Nano Research 2023, 16(1): 1320–1329 [IF 9.9]. doi.org/10.1007/s12274-022-4847-8
- A. Jayasree, M.N. Gómez-Cerezo, E. Verron, S. Ivanovski and K. Gulati*. Gallium-doped Dual Micro-Nano Titanium Dental Implants Towards Soft-Tissue Integration and Bactericidal Functions. Materials Today Advances 2022, 16, 100297 [IF 10.0]. doi.org/10.1016/j.mtadv.2022.100297
- T. Guo, S. Ivanovski and K. Gulati*. Optimizing Titanium Implant Nano-Engineering via Anodization. Materials & Design 2022, 223, 111110 [IF 8.4]. doi.org/10.1016/j.matdes.2022.111110

Research grants

2022-2023*

*to 1 July 2023

Project title	Granting scheme	Total amount	Investigator name
3D bioprinted oral tissue models	Colgate Palmolive Company	\$679,864.00	IVANOVSKI, Sašo
3D-printed customised Bio- Oss/Polydioxanone scaffold or vertical bone regeneration	Osteology Foundation Young/ Advanced Researcher Grant	\$145,484.23	IVANOVSKI, Sašo VAQUETTE, Cedryck
A fibre guiding scaffold functionalised with Emdogain® for periodontal regeneration	Australian Dental Research Fund Inc	\$9,130.00	STAPLES, Reuben VAQUETTE, Cedryck
A Non-Profit Software System for Facilitating Dental 3D surface Comparison in Routine Forensic Identification and Disaster Victim Identification Incidents	Queensland Health Forensic and Scientific Services	\$6,600.00	PETERS, Ove A PETERS, Christine I ALQAHTANI, Sakher
Contemporary evidence for water fluoridation program – a before-and-after population-based study	NHMRC IDEASGrants	\$1,678,455.95	DO, Loc SPENCER, John FORD, Pauline BROWN, Mark WHELTON, Helen BROADBENT, Jonathan ROBERTS-THOMSON, Kaye LALOO, Ratilal FOLEY, Michael
Determinants of inequality in child oral health at school age – A prospective cohort study	NHMRC Project Grant	\$533,547.00	DO, Loc GOLLEY, Rebecca HA, Diep LEARY, Sam MANTON, David SCOTT, Jane THOMSON, William SPENCER, John
Determining the accuracy of interproximal enamel reduction performed in aligner treatment using a three-dimensional model system	Align Technology Research Grants	\$35,079.30	FREER, Elissa M KERR, Brett WEIR, Anthony P SHAILENDRAN, Arun V
Dimensionally stable vertical bone augmentation using release bone morphogenetic protein 2 loaded 3D-printed Gelatine Methacrylate/mesoporous bioglass	Australian Dental Research Fund Inc	\$14,146.00	VAQUETTE, Cedryck GOMEZ CEREZO, Maria N
Dual Micro-Nano Dental Abutments towards Enhanced Soft-Tissue Integration and Triggered Antibacterial Functions	International Team for Implantology Foundation	\$70,300.00	GULATI, Karan IVANOVSKI, Sašo
Evaluation of the impact of repeated sterilisation on the accuracy of digital scan bodies for implant impressions	Australian Dental Research Fund Inc	\$2,303.40	ARORA, Himanshu CHEN, Xiao HO, JiaYi LEE, Guan
Evolving trends in the surgical management of maxillofacial trauma	Australian & New Zealand Association of Oral & MaxillofacialSurgeons	\$6,462.00	JOHNSON, Nigel
Human osteoblast cell-derived small extracellular vesicles for in vivo periodontal wound healing in a rat model	Australian Dental Research Fund Inc	\$16,469.20	HAN, Pingping JIAO, Kexin RAVEENDRAN, Nimal IVANOVSKI, Sašo
Immunoengineered Nanocomposite Surface Coatings towards Soft Tissue Regeneration	International Team for Implantology Foundation	\$71,910.90	ZHOU, Yinghong HOU, Jingwei IVANOVSKI, Sašo HAN, Pingping
Mineralisation patterns of dental pulps: A multimodular ex vivo Analysis	Australian Dental Research Fund Inc	\$3,740.00	PETERS, Ove A MARSHALL, Georgina PETERS, Christine I



Project title	Granting scheme	Total amount	Investigator name
Motion sensor and haptic technologies in evaluating and training postural habits for optimum ergonomic clinical practice	Australian Dental Research Fund Inc	\$8,234.60	ZAFAR, Sobia DANYLAK, Stefan WALSH, Laurence J
Nano-engineered bacteriobot for the treatment of biofilms infection on dental implants	Australian Dental Research Fund Inc	\$16,251.40	XU, Chun WANG, Yi QIAO, Ruirui
Oral Health in Aged Care: Addressing Oral Health Inequity and Unmet Dental Care Needs of Vulnerable Population	NHMRC MRFFDementia, Ageing and Aged Care Mission	\$1,425,890.90	DO, Loc NANGLE, Matthew R LUDLOW, Kristiana C GEORGIOU, Andrew WALKER, Nicole A HENRY, Julie D LOPEZ SILVA, Claudia P HA, Diep STORMON, Nicole L IVANOVSKI, Sašo WALSH, Laurence J TUFFAHA, Haitham SEXTON, Christopher T SCHUCH, Helena
Osseo- and soft-tissue integration using treated periodontal implants in a sheep (BioMedTech Horizons funding through Anisop Holdings)	Anisop Holdings Pty Ltd	\$79,999.70	IVANOVSKI, Sašo MORAN, Corey S
Periodontal cells-derived small extracellular vesicles on in vivo periodontal regeneration	Osteology Foundation Young/ Advanced Researcher Grant	\$90,184.00	HAN, Pingping SALOMON GALLO, Carlos F IVANOVSKI, Sašo
Regenerative treatment of peri-implantitis using bone constructs with osteogenic, immunomodulatory and antimicrobial properties	International Team for Implantology Foundation	\$164,358.44	IVANOVSKI, Sašo VAQUETTE, Cedryck HEITZ-MAYFIELD, Lisa BARTOLD, Mark BERGLUNDH, Tord
Resorbable metals, tissue biofabrication and dentistry – Joint Fellowship appointment	Metro North Hospital and HealthService	\$651,000.00	IVANOVSKI, Sašo
Small extracellular vesicles-loaded titanium nanopores for gingival peri-implant soft tissue barrier	International Team for Implantology Foundation	\$70,382.40	HAN, Pingping GULATI, Karan IVANOVSKI, Sašo
Testing of a cannabinoid, botanical-based formulation for oral pain relief applications	Innovation Connections	\$108,490.30	XU, Chun
The effects of novel photosensitising nanocomposite gel on oral biofilm contaminated SLA titanium surface	International Team for Implantology Foundation	\$72,298.39	LEE, Sang B ZHOU, Yinghong LI, Li
The impact of oral piercings: An investigation into the rate of metal dissolution and metal ion release under acidic challenge	Australian Dental Research Fund Inc	\$7,060.90	ZAFAR, Sobia MASOOD, Manal WALSH, Laurence J
Understanding resorption patterns in vertically augmented bone	International Team for Implantology Foundation	\$69,813.34	VAQUETTE, Cedryck IVANOVSKI, Sašo HAN, Pingping BATSTONE, Martin
Designing a roadmap to empower community health workforce in integrating oral health and general health in rural Vietnamese population	UQ Global Partnership Grant	\$10,000	Diep Ha Laurence Walsh Loc Do Claudia Lopez Silva

Publications

2022

Book chapter

Gulati, K.* (2022) Supramolecular surface modifications of titanium implants. In(Eds.), Supramolecular chemistry in corrosion and biofouling protection (pp.393-409). Boca Raton, FL, United States: CRC Press.

Journal articles

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Abaid, S., Zafar, S.* Kruger, E. and Tennant, M. (2022) The applicability of the Tanaka and Johnston analysis in a contemporary Western Australian population. Australasian Orthodontic Journal, 38(1): 153-161.

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Abdal-hay, A.* Sheikh, F., Gómez-Cerezo, N.* Alneairi, A., Luqman, M., Pant, H., et al. (2022) A review of protein adsorption and bioactivity characteristics of poly-caprolactone scaffolds in regenerative medicine. European Polymer Journal, 162.

Abdal-hay, A.* Staples, R.* Alhazaa, A., Fournier, B., Al-Gawati, M., Lee, R.* et al. (2022) Fabrication of micropores on titanium implants using femtosecond laser technology: Perpendicular attachment of connective tissues as a pilot study. Optics and Laser Technology, 148: 1-8.

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2023*

*to 1 July 2023

Book chapters

Chopra, D. and Gulati, K.* (2023) Mechanical stability of anodized nano-engineered titanium dental implants. In (Eds.), Surface modification of titanium dental implants (pp. 199-218). Cham, Switzerland: Springer International Publishing.

Guo, T.*, Ivanovski, S.* and Gulati, K.* (2023) From micro to nano: surface modification for enhanced bioactivity of titanium dental implants. In (Eds.), Surface modification of titanium dental implants (pp. 117-151). Cham, Switzerland: Springer International Publishing.

Guo, T.*, Scimeca, J., Ivanovski, S.*, Verron, E. and Gulati, K.* (2023) Cytotoxicity, corrosion and electrochemical stability of titanium dental implants. In (Eds.), Surface modification of titanium dental implants (pp. 219-253). Cham, Switzerland: Springer International Publishing.

Jayasree, A.*, Ivanovski, S.* and Gulati, K.* (2023) Local therapy from nano-engineered titanium dental implants. In (Eds.), Surface modification of titanium dental implants (pp. 153-198). Cham, Switzerland: Springer International Publishing.

Kocak-Oztug, N.* and Raval, E. (2023) Titanium dental implants in compromised conditions: need for enhanced bioactivity and therapy. In (Eds.), Surface modification of titanium dental implants (pp. 23-59). Cham, Switzerland: Springer International Publishing.

Vaquette, C.*, Ivanovski, S.* and Batstone, M. (2023) Current approaches in vertical bone augmentation and large bone deficiencies in the orofacial region. In (Eds.), Regenerative medicine: emerging techniques to translation approaches (pp. 287-303). Singapore: Springer Nature Singapore.

Journal articles

Abdal-hay, A.*, Bartnikowski, M.* Blaudez, F.* Vaquette, C.*, Hutmacher, D. and Ivanovski, S.* (2023) Unique uniformity of calcium phosphate nanoparticle distribution in polymer substrates for additive manufacturing. Composites Part A: Applied Science and Manufacturing, 173.

Abdal-hay, A.*, Ramachandra, S., Alali, A., Han, P.*, Sheikh, F., Hashem, M., et al. (2023) Vertically aligned calcium phosphate nanoplates coated onto melt electrowritten 3D poly(ϵ -caprolactone) fibrous scaffolds for inhibiting biofilm formation. Journal of Alloys and Compounds, 966.

Aktar, S., Baghaie, H.* Islam, F., Gopalan, V. and Lam, A. (2023) Current status of circulating tumor cells in head and neck squamous cell carcinoma: a review. Otolaryngology – Head and Neck Surgery, 168(5): 988-1005.

Ali, K., Alhaija, E., Raja, M., Zahra, D., Brookes, Z., McColl, E., et al. (2023) Blended learning in undergraduate dental education: a global pilot study. Medical Education Online, 28(1): 1-9.

Almuqrin, A.*, Kaur, I.* Walsh, L.* Seneviratne, C.* and Zafar, S.* (2023) Amelioration strategies for silver diamine fluoride: moving from black to white. Antibiotics, 12(2): 1-18.

Arabpour, F., Kuzekanani, M., Walsh, L.* and Mirzaei, M. (2023) Knowledge, attitudes and performance of Iranian endodontists regarding patients with kidney diseases. European Endodontic Journal, 8(1): 90-95.

Blaudez, F.*, Ivanovski, S.* Fernandez, T.* and Vaquette, C.* (2023) Effect of in vitro culture length on the bone-forming capacity of osteoblast-derived decellularized extracellular matrix melt electrowritten scaffolds. Biomacromolecules.

Chan, W., Gulati, K.* and Peters, O.* (2023) Advancing Nitinol: from heat treatment to surface functionalization for nickel-titanium (NiTi) instruments in endodontics. Bioactive Materials, 22: 91-111.

Chen, P., Chen, Z., Teoh, Y.* Peters, O.* and Peters, C.* (2023) Orifice barriers to prevent coronal microleakage after root canal treatment: systematic review and meta-analysis. Australian Dental Journal, 68(2): 78-91.

Chien, P., Wan, B., Walsh, L.* and Peters, O.* (2023) Experimental and 2-step finite element analysis of cyclic fatigue resistance of conventional and heat-treated rotary endodontic nickel-titanium instruments. Applied Sciences, 13(4).

Choi, S., Choi, J., Peters, O.* and Peters, C.* (2023) Design of an interactive system for access cavity assessment: a novel feedback tool for preclinical endodontics. European Journal of Dental Education.

Chuang, J.* Pradhan, A.* Walsh, L.* and Lopez Silva, C.* (2023) Singapore dentists' attitudes toward dental care provision for older adults with disabilities. Gerontology.

Dhanapriyanka, M.* RDFC, K. and Jayasekara, P. (2023) Effectiveness of health promotion intervention on the knowledge and selected practices related with oral cancer among a group of vulnerable youth in Sri Lanka. BMC Public Health, 23(1).

Fernandez-Medina, T.* Vaquette, C.* Gomez-Cerezo, M.* and Ivanovski, S.* (2023) Characterization of the protein corona of three chairside hemoderivatives on melt electrowritten polycaprolactone scaffolds. International Journal of Molecular Sciences, 24(7): 1-21.

GBD 2019 Australia Collaborators, Laloo, R.* Uddin, R.* Khan, A.* Anderlini, D.* Endalamaw, A.* et al. (2023) The burden and trend of diseases and their risk factors in Australia, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. The Lancet Public Health, 8(8): e585-e599.

Ghanbarzadegan, A., Ivanovski, S.* Sloan, A. and Spallek, H. (2023) Oral health research funding in relation to disease burden in Australia. Australian Dental Journal, 68(1): 42-47.

Guo, J., Peters, O.* and Hosseinpour, S.* (2023) Immunomodulatory effects of endodontic sealers: a systematic review. Dentistry Journal, 11(2).

Guo, T.* Scimeca, J., Ivanovski, S.* Verron, E. and Gulati, K.* (2023) Enhanced corrosion resistance and local therapy from nano-engineered titanium dental implants. Pharmaceutics, 15(2): 1-24.

Han, P.* and Ivanovski, S.* (2023) 3D bioprinted extracellular vesicles for tissue engineering – a perspective. Biofabrication, 15(1): 1-13.

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Han, P.* Jiao, K.* Moran, C.* Liaw, A.* Zhou, Y.* Salomon, C.* et al. (2023) TNF- α and OSX mRNA of salivary small extracellular vesicles in periodontitis: a pilot study. Tissue Engineering. Part C. Methods, 29(7): 298-306.

Han, P.* Moran, C.* Sulugodu Ramachandra, S.* Walsh, L.* and Ivanovski, S.* (2023) Antibody response to BNT162b2 mRNA vaccine in gingival crevicular fluid. Journal of Periodontology, 94(1): 77-87.

Hollingworth, S.* McGuire, T.* Van Driel, M.* Begum, N.* Ford, P.* Hawley, G.* et al. (2023) Antimicrobial stewardship: prescribing across the primary care health professions. Pharmacology Research & Perspectives, 11(3).

- Hopcraft, M., Stormon, N.*, McGrath, R. and Parker, G. (2023) Factors associated with suicidal ideation and suicide attempts by Australian dental practitioners. *Community Dentistry and Oral Epidemiology*.
- Ho, S.*, Walsh, L.* , Pradhan, A.* , Yang, J. and Lopez Silva, C.* (2023) Perspectives of oral health therapists on the barriers to oral care provision in nursing homes in Singapore: a qualitative analysis. *Special Care in Dentistry*.
- Huynh, R.* , Peters, C.* , Zafar, S.* and Peters, O.* (2023) Evaluating the stress of root canal treatment in patients and dentists compared to other dental treatments: a systematic review and meta-analysis. *European Journal of Oral Sciences*, 131 (4).
- Izadi, R., Bahrami, M., Sarikhani, Y. and Bastani, P.* (2023) Qualitative document analysis on Iranian contents and trends of population policies: Lessons learned and avenues for future. *Helijon*, 9(6): 1-15.
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- Koggallana, S.* , Jayasekara, P., Abeysinghe, P. and Laloo, R.* (2023) Health related quality of life of oral cancer patients who receive radiotherapy with or without chemotherapy in Sri Lanka. *Journal of Multidisciplinary Dental Research*, 9 (1): 1-9.
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- Liaw, A., Liu, C.* , Bartold, M.* , Ivanovski, S.* and Han, P.* (2023) Salivary histone deacetylase in periodontal disease: a cross-sectional pilot study. *Journal of Periodontal Research*, 58(2): 1-11.
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- Murray-Douglass, A.* , Peters, M.* , Johnson, N.* and Harris, R.* (2023) The impact of orbital volume on post-traumatic enophthalmos: a systematic review and meta-analysis. *The Journal of Craniofacial Surgery, Publish Ahead of Print*(5): 1420-1426.
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- Niknam, F., Sharifian, R., Bashiri, A., Mardani, M., Akbari, R., Tuffaha, H.* , et al. (2023) Tele-dentistry, its trends, scope, and future framework in oral medicine: a scoping review during January 1999 to December 2021. *Archives of Public Health*, 81(1): 1-14.
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- Rather, A., Khan, R., Wani, T., Rafiq, M., Jadhav, A., Srinivasappa, P., et al. (2023) Polyurethane and cellulose acetate micro-nanofibers containing rosemary essential oil, and decorated with silver nanoparticles for wound healing application. *International Journal of Biological Macromolecules*, 226: 690-705.
- Raveendran, N.* , Ivanovski, S.* and Vaquette, C.* (2023) The effect of culture conditions on the bone regeneration potential of osteoblast-laden 3D bioprinted constructs. *Acta Biomaterialia*, 156: 190-201.
- Russell, J.* , Volker, G., McGarvey, D., Sharpe, C., Breik, O., Borgna, S., et al. (2023) An objective analysis of composite free flap donor site morbidity in head and neck surgery: Prospective series. *Head and Neck*, 45(2): 398-408.
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- Siddiqi, A. and Zafar, S.* (2023) Scope of silver nanoparticles in periodontal and peri-implant wound healing: a systematic review of translation research. *Essentials of Dentistry*, 2(2): 55-65.
- Stormon, N.* and Sexton, C.* (2023) Parental recall bias in observational studies: child dental service use. *International Journal of Paediatric Dentistry*.
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- Teixeira, H., Laloo, R.* , Evans, J., Fuss, J., Pachana, N.* and Burton, N. (2023) Sources of occupational stress among dentistry academics. *European Journal of Dental Education*, 27(3): 527-534.
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- Xu, T.* , Xie, K., Wang, C., Ivanovski, S.* and Zhou, Y.* (2023) Immunomodulatory nanotherapeutic approaches for periodontal tissue regeneration. *Nanoscale*, 15(13): 5992-6008.
- Yao, S., Du, Z., Xiao, L., Yan, F., Ivanovski, S.* and Xiao, Y. (2023) Morphometric changes of osteocyte lacunar in diabetic pig mandibular cancellous bone. *Biomolecules*, 13(1).

Postgraduate research

Higher degree by research (HDR): PhD and MPhil – enrolled students

Farzaneh Afkhami Jeddi

PhD: Point-of-service pulp resting: molecular and optical approaches

Manar Alderi

MPhil: Clinical and aesthetic evaluation of single implants supporting cantilever restorations.

Yasmen Alfaaisal

MPhil: Vital pulp treatment: are treatment decisions related to dentist experiences and patients' socioeconomic class?

Amjad Almuqrin

PhD: Assessment of the effects of professionally applied silver diamine fluoride on early childhood caries

Omar Breik

PhD: Bioresorbable metals as an alternative to titanium for intraoperative vessel ligation

William Carlson-Jones

PhD: The evolution of the oral health workforce

Divya Chopra

PhD: Therapeutic potential of nano-engineered zirconium dental implants

Huan Dai

PhD: Functionalized nanoparticles-based dual-drug delivery system for bone regeneration

Stefan Danylak

MPhil: To investigate the use of kinematic, motion sensor and haptic technologies in evaluating ergonomic clinical practice of the dental workforce.

Thi Minh An Dao

PhD: Predictors of early childhood caries in South Australian children

Bilal El-Masoud

PhD: Improving the survival of cylindrical stud attachment retained complete overdentures

Ryan Goh

MPhil: Assessment of mandibular bone deposition over a subperiosteal implant: conversion of a subperiosteal implant into an endosteal implant

Tianqi Guo

PhD: Fabrication optimization of bioactive nano-engineered titanium dental implants

Thomas Hogerheyde

MPhil: The effects of decontamination practices and diet on preformed paediatric crowns, and their biocompatibility in the oral cavity

Shu Hua

PhD: Multifunctional nanoparticles with targeting and controlled release ability for the management of osteoarthritis

Richard Huynh

MPhil: Barriers to widespread endodontic practice amongst general dentists in Queensland, Australia

Anjana Jayasree

PhD: Nano-engineered dental implants towards tailored therapy

Nicolie Jenkins

PhD: Oral health workforce

Kexin Jiao

MPhil: The potential of periodontal cells derived extracellular vesicles with 3D bioprinting

Yvonne Lai

PhD: Evaluating oral health and its impacts in Rett syndrome- stepping-stones to achieving a better quality of life

Soo Jin Lim

MPhil: The effect of probiotics in oral biofilm

Chun Liu

PhD: The emerging role of outer membrane vesicles in periodontitis

Claudia Lopez Silva

PhD: The dental-systemic interface and respiratory infections in intensive care unit

Hasan Maki

MPhil: A novel highly porous bioresorbable 3D scaffold using pure zinc mesh for a vertical bone augmentation

Manal Masood

MPhil: Level of knowledge and awareness of dental complications with oral piercings among body piercing professionals and pierced individuals

Alison Nation

PhD: Does early access to public oral health services from 6 months of age prevent caries experience in children?

Marisca Pereira

PhD: Melt electrowritten (MEW) fibrous scaffold for oral soft tissue augmentation

Lyndal Pritchard

PhD: Improving the oral health for older Australians

Christopher Sexton

PhD: Population oral health interventions and water fluoridation for the prevention of dental caries

Nilesh Torwane

PhD: Impact of water fluoridation as a marker for social inequalities, possible perceived safety, benefit and risks with relation to parental support in Queensland, Australia

Nadeeka Udawatte

PhD: Oral microbiome profiles in gestational diabetes mellitus (GDM) and impact of probiotics intervention

Arosha Weerakoon

PhD: Dentine, adhesive interfaces & physiological ageing

Juan Wen

PhD: Promoting periodontal regeneration through 3D printed nano-engineered membrane delivering lithium and VEGF

Enmao Xiang

PhD: Zn based biodegradable metals for biomedical application

Negar Yazdani

PhD: Gold plasmonic nanohole array for salivary exosome profiles





HDR completions 2022

Philip Chien

MPhil: Cyclic fatigue resistance of nickel-titanium rotary endodontic instruments: an experimental and finite element analysis study

Reuben Staples

PhD: The controlled manufacturing of fibre-guiding scaffolds for promoting functional periodontal ligament attachment

Aya Alali

MPhil: The effects of bioinspired titanium nanostructure on gingival fibroblasts and oral biofilm

Srinivas Sulugodu Ramachandra

PhD: Effect of azithromycin on oral biofilms and as an adjunct to the non-surgical treatment of periodontitis

Ashwin Nanda

MPhil: An ultra-low voltage electrochemical approach for biofilm removal from titanium

Nithin Manchery

PhD: Oral Health and Cognitive Function in Vulnerable Populations

HDR completions 2023

Amelia Carr

PhD: Development of a 3D printed bone-ligament-bone construct for scapholunate interosseous ligament reconstruction

Michael Foley

PhD: Contextual and compositional factors associated with clinical and subjective oral health in Australian children

Sepanta Hosseinpourdougolsar

PhD: Mesoporous silica nanoparticle-based non-viral gene delivery systems for bone regeneration

Arosha Weerakoon

PhD: Dentine, adhesive interfaces & physiological ageing

Vignesh Selvapritchivraj

PhD: Injectable hydrogels for orodental reconstruction

Tianqi Guo

PhD: Fabrication optimization of bioactive nano-engineered titanium dental implants

Doctor of Clinical Dentistry, graduated 2022

Remy Golding

Tapiwa Gwengo

Jonathan Lam

Joseph O'Connor

Caitlin Stephens

Gabrielle Bou-Samra

Thomas Briggs

Andrew Liaw

Reeynaa Ohm

Doctor of Clinical Dentistry students, 2023

Konna Chakravarty

Endodontics

Sepanta Hosseinpourdougolsar

Endodontics

Benjamin Gad

Oral Medicine

Jared Marks

Orthodontics

Joyce Wu Ai Wong

Orthodontics

Sae Mi Bok

Periodontics

An-Lun (Alun) Cheng

Periodontics

Jenny Wang

Periodontics

Rashid Al Shereiqi

Prosthodontics

George Jiang

Prosthodontics

Oleg Pushkarev

Prosthodontics

Sadaf Rizwan

DMFR

Georgina Marshall

Endodontics

Helen McHugh

Endodontics

Kathryn Briggs

Orthodontics

Keith Chan

Orthodontics

Annabel Hoe

Orthodontics

Laura Truong

Orthodontics

Denise Hsueh

Periodontics

Daniel McKenzie

Periodontics

Wui Kit (Jackie) Yiu

Periodontics

Thanh (Justin) Le

Prosthodontics

Soo Hee Lim

Prosthodontics

Casey Walsh

Prosthodontics

John Biun

DMFR

Wai-Sze (Cece) Chan

Endodontics

Jasmine Holgate

Endodontics

Kushagra Ohri

Endodontics

Lanit Anand

Orthodontics

James English

Orthodontics

Matthew Moore

Orthodontics

Max Wei

Orthodontics

Su Sheng Quach

Periodontics

Alan Zhu

Periodontics

Himanshu Arora

Prosthodontics

Yong Hoon (Jimmy) Gim

Prosthodontics

Gloria Hsu

Prosthodontics

Cheuk Kee (Candy) Fun

Special Needs

Lydia See

Special Needs

Undergraduate research

Year 5 Bachelor of Dental Science (BDSc) – Student Research Projects, 2023

Kevin Xu, Jiaying Chen, Norman Hu

Changes and Trends of Dental School Injuries under Covid-19 Guidelines and Practices
Dr Sobia Zafar

Julianne Lee, Yiqao Wang, Christy Chu

Using virtual patients to assess students' knowledge regarding molar incisor hypomineralisation. Dr Sobia Zafar

Kristy Souksay, Ying Ting (Grace) Lin & Evelyn Ho

An audit of ePortfolios for UQ Endodontics: factors relevant for radiographic quality. Dr Christine Peters and Prof Ove Peters

Timothy Achterberg, Julia Phan & Earl Kwok

Alignment of preclinical teaching of trauma management with clinical reality. Dr Christine Peters, Dr Sobia Zafar, Professor Ove Peters

Jia Yi Ho, Guan Hong Lee, Xiao Wen Chen

Evaluation of the impact of repeated sterilisation on the accuracy of digital scanbodies for implant impressions. Dr Himanshu Arora

Junho Park, Tyfanie Guyenne, Xuan Hui Khiu

Patient compliance with the Perio patient bank and recalls. Dr Ryan Lee, Professor Sašo Ivanovski

Luan Lin Jovita Cheong, Ler Vonn, Anastasia Min The

Assessing the knowledge of dental students regarding dental trauma management in primary and young permanent teeth in children. Dr Sobia Zafar

Gabrielle Starr, Megan Morris, Jamila Rodbert

Comorbidities among patients presenting for dental extractions at UQ rural clinics: A retrospective study. Dr Jessica Zachar, Dr Sowmya Shetty

Yueming Gao, Weiqi (Janice) Zhang, Ian Wong

The effects of a nanoparticles based tooth desensitizer towards Streptococcus mutans biofilm. Dr Chun Xu

Rui Ching Lee, Vanessa Chow, Yuan Zhi Khor

Toothbrushing habit change in early childhood and early childhood caries/oral hygiene. Dr Diep Ha, Dr Nicole Stormon

Paul Oh, Gayle Tan & Ji Young Ban

Nanomaterials for tooth sensitive management by rapid and stable dentin tubules occlusion. Dr Chun Xu

Raewyn Huang, Matthew Fang & Wei Chen

Regenerative endodontic therapy with platelet-rich products: A review of the literature. Dr Sepanta Hosseinpour, Professor Ove Peters

Eric March, Kent Xiong, Lochlan Monckton

Knowledge and Attitudes regarding the role of artificial intelligence (AI) in dentistry: A survey. Dr Christine Peters, Professor Ove Peters

Theo Gan, Bill Guido, Joshua Devarajh

Students' perceptions of pre-clinical endodontic training with artificial teeth compared to extracted human teeth. Dr Sepanta Hosseinpour, Professor Ove Peters

Zachary Tan, Ebrahim Khanbhai, Pranav Yellore

Teaching engine-driven root canal instrumentations: Schools' utilisation and predoctoral students' preferences. Professor Ove Peters, Dr Wade Hsu

James Hamilton, Thomas Kahler, Russell Neglia-Wong

The effectiveness of subperiosteal implants for oral rehabilitation – A systematic Review. Dr Nigel Johnson

Mirabel Lee, Yuet Yau Dan, Shane Chen

Association between self efficacy and oral hygiene among 5 year old children. Dr Diep Ha and Dr Nicole Stormon

Chang Po Chun, Scarlett Chua, Beatrice See

Investigate to the reasons why restoration are being redone after 6 months of placement in the undergraduate Dental environment. Dr Wade Hsu

Xin Wen, Minsung Hong, Thomas Wong

Sortase A (SrtA) inhibitors as a potential novel therapeutic strategy against pathogenic oral biofilms.

Dr Jaya Seneviratne

Chee Heng Chan, Shirley Lim Jie Yi, Ying Alyssia Koh

Clinical and aesthetic evaluation of adjacent dental implants in the anterior maxilla. Dr Himanshu Arora

George Xu, Kieren Tso, Richard Zhang

Problem-based learning in dental education: a review of the literature. Dr Sepanta Hosseinpour

Darren Shirky, Hiba Majid & Michelle Chin

The management and recurrence of Desmoplastic Fibroma – A systematic review. Dr Nigel Johnson, Dr Jessica Zachar

Zirui Gong, Cathleen Li, Lily Zeng, Dr Unni Kunjukrishna Pillai

Kamyar Hakimi-Nejad & Senna Mannarino Dental trauma in children and determinants. Dr Diep Ha, Christopher Sexton



Research Day 2023

Student presentations

Christopher Sexton

Unequal access to water fluoridation in Queensland: time for reform to Government policy

Divya Chopra

Anodized nano-engineered zirconia dental implants: fabrication and bioactivity analysis

Anjana Jayasree

Elution of gingival fibroblast microvesicles from nanotubular implants influences inflammatory response of keratinocytes

Cheuk (Candy) Kee Fung

Use of real-time teledentistry to assess oral health in residential aged care facilities: a feasibility study

Kush Ohri

Torsional fatigue behaviour of rotary endodontic files.

Liam Cassidy, Sung Ho Lee, Ji Wan-William Ki

Preclinical VPT simulation using 3D-printed tooth models

Natalie Jia Yi Ho, Guan Hong Lee,

Xiao Wen Chen

Impact of construction material and repeated usage of implant scanbodies on the accuracy of digital impressions

Stefan Danylak

Comparison of visual and OHS software rating systems during dental training using motion and haptic sensors technologies

Lydia See

A split mouth comparative study of two silver fluoride protocols for arresting carious lesions and changes in discoloration in adults with special needs

Manal Masood

Missing the point: how aware of oral complications are body piercing professionals and pierced individuals?

Richard Huynh

Barriers to widespread endodontic practice amongst dental practitioners in Queensland, Australia

Anastasia The Min, Cheong Luan Lin Jovita, Ler Vonn

Assessing the knowledge and attitudes of dental students regarding dental trauma management in primary and young permanent teeth in children

Amjad Almuqrin

Synthesis of novel silver and selenium antimicrobial nanocomposites

Yvonne Lai

Identifying oral health related quality of life domains in Australian individuals with Rett Syndrome

Xu Kevin, Chen Jiaying, Hu Norman

Retrospective analysis of incidence and trends of dental school injuries before, during, and after Covid-19

Nilesh Torwane

Analysis of sentiments around water fluoridation using an investigative lens. What policies can fight 21st century info-war?

An Dao

Causal inference in longitudinal observational studies in oral health - a scoping review

Research staff



2022

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Dr Peivand Bastani
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Ms Michelle Do
Ms Thu Ha
Dr Diep Ha
Dr Manori Halgamuwe
Hewawasam
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A/Prof. Ryan SB Lee
Dr Claudia Lopez Silva

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Dr Desmond Ong
Dr Christine Peters
Prof. Ove Peters
Ms Lyndal Pritchard
Dr Sadaf Rizwan
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2023

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