ACKNOWLEDGEMENT OF COUNTRY

The Melbourne Dental School (MDS) acknowledges the Ancestors, Elders, and families of the Boonwurrung, Woiwurrung (Wurundjeri) and Wathaurung (Wadawurrung) on our Melbourne campuses, and the Gadigal and Guring-gai people of the Eora Nation on our Sydney campus. These groups are the custodians of university land and have been for many centuries. As we share our own knowledge practices within the University may we pay respect to the deep knowledge embedded within the Aboriginal community and their ownership of Country.
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The University of Melbourne’s enduring purpose is to benefit society through the transformative impact of education and research. (Advancing Melbourne 2030)

1884
A group of dentists formed the Odontological Society of Victoria. Mr John Iliffe (1847-1914), member and later President was the driving force in Victoria and the establishment of a hospital and college in Melbourne.

1890
The Melbourne Dental Hospital opened its doors.

1897
Followed by the opening of the Australian College of Dentistry devoted solely to the education of dentists.

1904
In 1904, a Faculty of Dental Science was established, and the College was affiliated with the University of Melbourne. In 1963 the Faculty and the hospital moved from 193 Spring Street to 711 Elizabeth Street, Melbourne.

1989
In 1989, the Faculty of Dentistry merged with the Faculty of Medicine (established 1876) to create a new Faculty of Medicine and Dentistry comprising a School of Medicine and a School of Dental Science respectively to reflect additional responsibilities.

1991
The Faculty expanded responsibilities to become the present Faculty of Medicine, Dentistry and Health Sciences.
It gives me great pleasure to welcome you to the inaugural Melbourne Dental School Annual Research Report. I have had the privilege of being a researcher at The Melbourne Dental School for over 30 years and during that time I have seen us grow into one of the finest dental research schools in the world. We have an excellent tradition of innovation and impactful research that has changed the way we view and treat oral disease and made a real difference to the oral health of people around the globe.

This report details the tremendous breadth and depth of our research and its impact, highlights our amazing early career researchers and award-winning students, and demonstrates the transdisciplinary and highly collaborative nature of our research. Many of our researchers are leaders or emerging leaders in their fields and indeed some of our researchers have literally created their own fields. Many of our PhD students have also gone on to become leaders in their fields, not only in Australia but throughout our region and around the globe.

I am justifiably proud of the research that is being conducted at the Melbourne Dental School and I hope you will take the time to read our inaugural Annual Research Report and learn more of the work that we are doing in Melbourne and how you can interact with us.

Yours sincerely

Professor Stuart Dashper
October 2021
MESSAGE FROM THE HEAD OF SCHOOL

I am delighted to introduce the Annual Research Report for the Melbourne Dental School, our first since my appointment as Head of School in 2020. As a researcher myself, I am delighted to be leading a School with a strong tradition of research endeavour and a School which is home to basic and clinical scientists who have been recognised as leaders in their field. Since my appointment I have implemented a process of change to structure our research activity across 3 broad Divisions, Basic and Clinical Oral Sciences; Cariology, Population Health & Oral Health; and Oral/Dental Education & Innovation, reflecting the research that is undertaken in the School.

Much has been achieved by academic staff, early career researchers and students in the School since my arrival. This report provides an opportunity to highlight the breadth and depth of research we conduct and provide information regarding activity from the School’s research groups. The emphasis of our research is on addressing key questions relevant to oral health and the burden of disease, but with a focus on fundamental sciences (including anatomy, microbiology, cell/molecular biology, systems biology, biomaterials, chemistry), behavioural sciences (population health, public health, health policy, informatics), clinical sciences (implantology, oral medicine) and educational pedagogy.

Melbourne Dental School engages in world leading translational research which strives to make significant advances to patient care and novel therapeutic approaches. We work with multiple collaborators and partners to undertake truly interdisciplinary studies and I hope you enjoy reading the report and learning more about the research activity of the School.

Yours sincerely

Professor Alastair Sloan
October 2021

“This report provides an opportunity to highlight the breadth and depth of research we conduct and provide information regarding activity from the School’s research groups.”
Established in 1904, The Melbourne Dental School is one of Australia’s leading oral health research centres. With over 60 researchers and research higher degree students, the School aims to be world leaders in the discovery and development of the next generation of preventives, therapeutics, vaccines, and diagnostics for oral diseases.

The School boasts state-of-the-art facilities in our three clinical and research laboratory buildings. Our research primarily targets prevention and cures for infectious, inflammatory, and immune diseases, with a focus on translational research that has a positive impact on global human health. The Melbourne Dental School is situated in The University of Melbourne’s Parkville Campus in the Melbourne Biomedical Research Precinct, Australia’s, and one of the world’s, leading biomedical precincts. Comprising over 40 hospitals, research, teaching and biotechnology institutes and organisations collocated just to the north of Melbourne’s CBD, the Melbourne Biomedical Research Precinct provides the Melbourne Dental School with unprecedented access to the very latest research technologies and some of the best biomedical researchers in the world.

We engage and collaborate with other research institutes, industry, and governments from across the globe, giving us significant research capacity to address significant health issues and research questions. The School’s vibrant research environment and extensive collaborations provide exceptional postgraduate research higher degree opportunities. We have an exceptional track record of translating research to the clinic and to policy.

MELBOURNE DENTAL SCHOOL
RESEARCH AT A GLANCE

650+
Staff and students

3 Major
RESEARCH THEMES
Infection, Inflammation & Immunity
Repair and Regeneration
Place, Community & Education

Publications
100+ per year
>43% involving an international collaboration
10,400+ CITATIONS (Over 10 Years)
Field Weighted Citation Impact of 1.64 (Over 5 Years)
40% of publications in top 10% international journals

Research Income for 2020
Research grant funding $5 million
Industry & other support $2 million

Partnering
Engagement with industry partners for basic research, translation, and commercialisation

Collaborations
Melbourne 14+
Australia 30+
Global 80+
Research at the Melbourne Dental School fits into three broad themes with each theme supporting interrelated and interconnected research groups.

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PERIODONTAL DISEASE THERAPEUTICS AND VACCINES

The Periodontal Disease Therapeutics & Vaccines research group is studying the host-microbes interaction in severe periodontitis (Stage III and IV) in an approach to identify key microbial virulence factors associated with disease progression. The group use animal models of periodontitis inoculated with human pathogens and also investigate patients with late-stage periodontitis being treated on a maintenance program. The aim is to develop an immunotherapeutic vaccine against the major common microbial virulence factors associated with disease progression to neutralise their action and to switch the destructive immune response to a healing response associated with homeostasis and health.

CLINICAL DEVELOPMENT OF A PORPHYROMONAS GINGIVALIS VACCINE.

Periodontitis is a chronic inflammatory disease of the supporting tissues of the teeth associated with a dysbiotic subgingival plaque which results in destruction of those tissues and loss of tooth attachment. Periodontitis has been linked with an increased risk of cardiovascular diseases, certain cancers, pre-term birth, rheumatoid arthritis and dementia. The global prevalence of severe periodontitis has been estimated to be around 12% affecting 743 million people.

P. gingivalis is a keystone pathogen in subgingival plaque which causes dysbiosis and the development of periodontitis. Studies in non-human primates and humans suggest that therapeutic vaccination targeting P. gingivalis is a novel and successful treatment option. From extensive research in a vaccine targeting the major virulence factors of P. gingivalis has been developed and shown to protect therapeutically against the progression of disease.

This project involves the clinical development of the P. gingivalis vaccine with a Phase I dose escalating safety and immunogenicity study and a Phase II study to provide proof-of-concept evidence for the use of the vaccine as an adjunctive therapy for the prevention of progression of periodontitis.


Periodontitis has been linked with an increased risk of cardiovascular diseases, certain cancers, pre-term birth, rheumatoid arthritis and dementia.
ANTIMICROBIALS, CANCER THERAPEUTICS AND VACCINE (ACTV) RESEARCH

The ACTV research group is focused on designing and synthesizing peptide-based nanomaterials that have antibacterial or anti-cancer properties or can be used in the fabrication of vaccines targeting oral bacteria or cancer cells.

ANTIMICROBIAL MATERIALS IN COMBATTING MULTIDRUG RESISTANT BACTERIA ‘SUPERBUGS’

The ACTV research group has a multi-disciplined and inclusive approach to understanding how the design and synthesis of peptide-based materials and nanomaterials influences their ability to target microbes or cancer cells in the development of antimicrobial and anticancer peptide-based materials. We use a chemical biology approach to understand how our materials induce their biological effect and how this can be enhanced to improve efficacy. We employ a range of organic/peptide synthetic, immunological, and microbial approaches to achieve the goals of the team to produce antimicrobials.


With funding from the Australian research Council, the National Health and Medical Council and Cancer Council Victoria, we published 23 journal articles in 2020-21 as a part of a collaborative approach seeking new antimicrobials.
ORAL MICROBIOLOGY AND MICROBIOME GROUP

We employ systems biology approaches to determine the causes of chronic human diseases and conditions that involve oral microorganisms. In particular, we are applying a range of microbiomic approaches to determine the aetiology of polymicrobial diseases that result from dysbiosis, including periodontitis and early childhood caries. We are determining how oral bacteria cause systemic diseases and conditions, including Alzheimer’s disease. The long-term goal of these studies is to identify biomarkers of disease and develop novel therapies and preventive regimes. We are funded by the NMHRC, National Foundation for Medical Research and Innovation and the Medical Research Futures Fund.

BREASTMILK INFLUENCES THE DEVELOPMENT AND COMPOSITION OF THE ORAL MICROBIOME

Human microbiomes assemble in an ordered and reproducible manner yet there is limited information on the colonisation and development of the bacterial communities that constitute the oral microbiome. This is especially true regarding the effect of early childhood diet on the temporal development of the oral microbiome. The aim of this study was to determine the effect of exposure to breastmilk on the assembly of the infant oral microbiome during the first 20 months of life. There were significant differences in the temporal development of the oral microbiomes of never breastfed and breastfed infants. Bacterial diversity was significantly higher in young, never breastfed infants due largely to an increased abundance of oral Veillonella and species from the Bacteroidetes phylum compared with breastfed infants. This is likely to reflect a more varied diet in never breastfed infants. Human milk oligosaccharides, one of the major components of human breast milk, are likely to play a prebiotic role in selection of early-colonising, health-associated oral bacteria, such as the Streptococcus mitis group, and have a significant influence over the temporal development of the infant oral microbiome.


The finding that breastmilk affects the healthy development of the oral microbiome supports WHO recommendations that, when possible, infants should receive breastmilk as their main food source for the first six months of life.
PERIODONTICS

The Periodontics group focuses on periodontology and surgical implant dentistry, particularly in relation to improved clinical understanding and treatment outcomes. The team works closely with the Centre for Oral Health to understand the microbial and immunological of the pathogenesis of periodontal disease as well undertaking research based in private specialist practices. Other projects have studied the healing of extraction sockets, ridge preservation and the interdisciplinary management of diabetes.

METABOLOMIC, MICROBIOMIC AND GENOMIC ASSESSMENT OF PERIODONTAL DISEASES

The aim of this project is to document the associations between periodontal disease and changes in clinical measurements, bacteria, substances the bacteria and body produce and the patient’s genetics. The key questions are: Do the bacteria associated with gum disease alter in relation to patient genetics, changes in the metabolome or interaction with other bacteria within the dental plaque. Are there genes that make it more likely that someone will get periodontal disease? How do the changes in the metabolome relate to virulence of bacteria? What is the effect of treatment on these?

Management of periodontal disease is not always effective. By understanding the interaction between genetics, the metabolome and microbiome, a more targeted and effective treatment may be provided.

Researchers: McGregor N, Darby I

Concept diagram representing bacterial biochemical pathways resulting in neutralisation and alkalinisation of the external environment

Ridge preservation of a 21 socket
ORAL MEDICINE AND ORAL CANCER GROUP

The Oral Medicine and Oral Cancer Group undertakes extensive studies of oral mucosal disease, particularly in relationship to the early recognition and development of oral cancer. Oral potentially malignant disorders are studied using novel models, treatment, and diagnostic precision for the prevention and treatment of oral mucosal disease. In parallel, the group investigates the early molecular events driving the onset of oral mucosal diseases, including oral autoimmune, inflammatory, and malignant conditions. Our research aims to develop novel mechanism-based prevention and/or treatment strategies for these diseases.

We are funded by the Medical Research Future Fund - BioMedTech Horizons (BMTH) program, UoM Early Career Researcher and Dean’s Innovation grants, and our industry partners Optiscan.

IMPROVING EARLY AND PROGRESSIVE DIAGNOSTICS FOR ORAL AND OESOPHAGEAL CANCERS

Late detection of oral and oesophageal cancer is associated with advanced disease resulting in increased morbidity and mortality. If progressive premalignant lesions can be detected early and in-situ, less aggressive treatment will result in favourable prognosis. We are developing accurate diagnostic methods using the OptiScan (ViewnVivo), a miniaturized handheld state-of-the-art point-scanning confocal endomicroscope invented and commercially developed in Melbourne. Currently invasive biopsy-based diagnosis for premalignancy and intraoperative surgical margin assessment are time inefficient and inadequate for early diagnosis and treatments. The OptiScan allows us to observe the stages of cancer development for in vivo diagnostic image mapping coupled with small molecule-targeted topically applied fluorophores to confirm suitability for accurate cancer diagnosis of patients at a very early stage of tumour development.

These studies will dramatically improve our knowledge of oral and oesophageal cancers: providing a developmental roadmap. By combining these studies with our, new to Australia/world, diagnostics, we will improve/accelerate precision diagnosis. Our translational studies will build on our tumour stratification approach through staged in vivo monitoring.

Researchers: Celentano A, Yap T, McCullough M

Oral squamous cell carcinoma is one of the most commonly diagnosed cancers globally (2020), with current 5-year survivals of only ~50%. These dire statistics point to a lack of effective early diagnosis. Late detection is associated with advanced disease including loco-regional invasion and metastasis resulting in increased morbidity and mortality.
INFECTION, INFLAMMATION, AND IMMUNITY

PAEDIATRIC ORAL HEALTH

In partnership with the Murdoch Children’s Research Institute, our multidisciplinary team of clinicians and scientists work to understand and improve child oral health. With numerous active collaborations with local and international groups, we undertake longitudinal and interventional research to explore the many ways oral health and overall health interact in childhood. Areas of focus include clinical and population health research into dental caries and enamel hypomineralisation, oral health in children with medical conditions, the use of 3-D intra oral scanning to measure and monitor dental health, oral health promotion and population-level interventions to improve child oral health.

THE INFLUENCE OF EARLY DIETARY FREE SUGAR INTAKE ON DENTAL CARIES: FINDINGS FROM A PROSPECTIVE STUDY

Dental caries (tooth decay) is the commonest disease worldwide and affects a third of Australian pre-school children. This study, embedded within the Barwon Infant Study, a longitudinal cohort of children recruited from birth and followed through childhood showed that free sugar intake increases rapidly between 18 months and 4 years. Increased amounts of free sugar intake, even as young as 18 months, increases dental caries risk later in childhood. Our study shows that reducing free sugar intake to less than 5% of total energy intake reduced dental caries in childhood.


Young children have too much sugar - almost two thirds exceed 5% of total energy intake by four years of age. Dietary free sugar intake increases rapidly between 18 months and 4 years. Higher levels of free sugar at 18 months can increase risk of dental caries later in childhood.
INFECTION, INFLAMMATION, AND IMMUNITY

BACTERIAL TYPE IX SECRETION SYSTEM

Bacterial The Type IX Secretion System (T9SS) Group studies a newly identified bacterial secretion system of the Bacteroidetes phylum. A pathogen associated with severe periodontitis Porphyromonas gingivalis is used as the model organism to study the secretion system to focus on the structure, function, and organisation of the nanomachinery to provide mechanistic insight into its role in loading virulence factors onto the surface of the cell and outer membrane vesicles. The group uses electron cryotomography, proteomics and other techniques to probe the architecture and protein complexes of the nanomachine.

MOLECULAR CHARACTERIZATION OF THE TYPE IX SECRETION SYSTEM OF PORPHYROMONAS GINGIVALIS.

The novel Type IX Secretion System (T9SS) in P. gingivalis is the key pathway that allows the surface presentation of multiple virulence factors. The genes encoding the T9SS are present in many pathogenic species of the Bacteroidetes phylum. We propose to characterise the T9SS powertrain that loads virulence factors onto the surface of the cell and outer membrane vesicles (OMVs). We will elucidate the mechanisms connecting energy harnessed from the inner membrane to the powering of secretion and the formation of the electron dense surface layer (virulence coat) around the cell and OMVs. We will also use electron cryotomography to study the 3D architecture of the secretion nanomachine. The elucidation of T9SS structures and mechanisms will aid in the development of novel therapies that are specific to certain pathogens and therefore may be applicable to several diseases without the risk of damage to either animal or human host cells or commensal bacteria.

Research Authors: Reynolds E, Veith P, Gorasia D, Glew M

Diagrammatic representations of the Type IX secretion system of P. gingivalis and its role in interactions with the host.
DENTAL MATERIAL AND MINERALISATION

The Mineralised Tissue Research Group investigates a range of aspects of mineralised tissues: from fundamental human bone biology to more applied and health focussed themes.

These include the effects of life events and population ancestry on teeth and the craniofacial skeleton. Research is conducted by an interdisciplinary group of anatomists, dental and biological anthropologists, clinical dentists and specialists and earth scientists. We focus on evidence of diet and disease in mineralised tissues, changes in mineralised dental tissue features caused by trauma, disease and other life events.

TRACKING DEVELOPMENT OF AGE-RELATED CORTICAL POROSITY

The collaborative project with St Vincent’s Research Institute aims to understand how human bone responds in ageing. High-resolution micro-CT imaging and infrared light imaging will be combined with histomorphometry to analyse the mineralised phase of human cortical bone. This research is being carried out using samples from the Melbourne Femur Research Collection: a unique well-provenanced collection of contemporary human bone samples. This project has the potential to help answer questions about cortical bone remodelling, which applies to many aspects of dental treatment and research.

This new project will bring new understanding to the bone remodelling process, adding important information to the current body of knowledge.

Researchers: Hardiman R, Sims N, Sloan A

Professor Alastair Sloan

Dr Rita Hardiman

Anthropological assessment being carried out by PhD candidate Angela Goh.
REPAIR AND REGENERATION

RESTORATIVE DENTAL MATERIALS

New direct restorative dental materials are coming on the market regularly, and bespoke materials are being developed for patients’ requirements. Glass-ionomer (GI) and resin-based ion-leaching restorative materials (RB-ILMs) are being developed as so-called “smart materials”. These restorative materials can release ions as a function of the ions present within the restorative dental material, and also recharge ions from other dental products (e.g. varnishes and toothpastes etc) in response to their chemical surroundings. These stored ions help augment the concentration of ions present in the saliva and the oral environment to prevent tooth demineralization and encourage remineralization. Recently (2021), a PhD student (Chirayu Ruengrungsom) investigated contemporary ILMs materials to evaluate their mechanical properties in addition to their ion release, and rechargeability to provided evidence for improved material selection for each clinical scenario.

Researcher: Palamara J, Ruengrungsom C

LIFE HISTORY PARAMETERS IN ACCELLULAR EXTRINSIC FIBRE CEMENTUM MICROSTRUCTURE

Life-history parameters such as pregnancies, skeletal trauma, and renal disease have previously been identified from hypomineralised incremental lines of AEFC. The precise periodicity of these growth layers remains unverified, so causal life-history explanations using tooth cementum cannot be rigorously calculated or tested. We propose a new methodological approach for cementum research to measure degree and distribution of mineralization of cementum increments. The project’s aim is to develop a powerful new tool for life history researchers across disciplines.

Developing a highly innovative analytical technique for establishing life history parameters and fertility rates from AEFC, within the context of the larger populations through time.

Researcher: Edinborough M
CARIOLOGY RESEARCH

The Cariology research group is studying the microbial and molecular processes of dental caries progression and regression using in vitro and in situ models as well as randomised, controlled clinical trials. The group is developing novel remineralisation and prebiotic systems using a saliva biomimetic phosphopeptide-stabilised amorphous calcium phosphate nanotechnology that acts synergistically with fluoride, particularly stannous fluoride to repair early stages of dental caries and help promote the return of oral commensal bacterial species antagonistic to plaque cariogenic species to help promote homeostasis and oral health.

PROJECT: REPAIR OF TOOTH ENAMEL/DENTINE BY BIOMIMETIC MINERALISATION

Dental caries and erosion are substantial public health problems in Australia. Fluoride ion’s ability to remineralise tooth enamel has recently been shown to be calcium limited. CPP-ACP is a new remineralisation technology that enhances the efficacy of fluoride by acting as a saliva biomimetic providing bioavailable calcium and fluoride ions to promote remineralisation. However, remineralisation is a very slow process taking several months, if not more, to remineralise enamel and dentine lesions and usually that process does not seal those lesions such that caries and erosion can still progress. A high concentration (e.g., 60% w/v) metastable solution of CPP-ACP/F can be prepared containing calcium, phosphate, and fluoride in the fluorapatite molar ratio. This amorphous fluorapatite gel can transform into a mineralised layer of fluorapatite (FA) integrated into the enamel or dentine as shown using transverse microradiography [Figs 1 & 2]. This technology could assist in managing early stages of coronal and root caries/erosion and tooth sensitivity non-invasively by the formation of a biomimetic FA mineralised seal. The overall aim of this Project is to obtain “proof-of-concept” data for this highly novel biomimetic mineralisation system based on high concentrations of CPP-ACP/F.

Researchers: Reynolds E, Shen P, Fernando J

Laureate Professor Eric Reynolds
https://findanexpert.unimelb.edu.au/profile/12757-eric-reynolds

Dr Peiyan Shen

Dr James Fernando

Fig 1. White spot lesions treated on the left enamel half-block with 60% CPP-ACP/F

Fig 2. TMR of cross section of dehydrated dentine 48 hr after treatment with 60% CPP-ACP/F showing the formation of an integrated mineralised surface layer (arrow).
ORTHODONTICS

Solid clinical research is the future in Orthodontics since the specialty is still lacking consensus on many important clinical issues. More specifically, the Orthodontic clinical research group mostly focuses on 3D outcomes of orthodontic treatments, stability after orthodontic treatment, digital workflows, and esthetic appliances. The projects include randomized controlled clinical trials as well as large retrospective studies, aiming to foster strong research outcomes towards better clinical guidelines in orthodontics. The group is in close contact with the Australian Association of Orthodontics and wishes to set up joint projects within the eviDent Dental Practice Based Research Network.

TEMPOROSPATIAL EXPRESSION OF ANKYLOSIS-RELATED PROTEINS IN MOUSE TOOTH GERMS

Primary molar ankylosis, the pathologic fusion of teeth to the surrounding bony socket, often results in deleterious consequences on adjacent teeth and bone. Its molecular aetiology and pathogenesis were elusive until recent studies demonstrated differentially expressed genes in the furcal bone and periodontal ligament of infraoccluded primary molars. This study investigated the temporospatial expression of 6 key proteins (linked to differentially expressed genes) during tooth germ development, providing clues to their possible functions during development and ankylosis. Mouse mandibular first molar teeth at time points E16 and P1 underwent immunofluorescent staining to determine the expression of proteins CK13, S100A2, ODAM, BMP5, AXIN2 and NFATc2 and visualised using confocal microscopy. Novel patterns of expression during tooth development not previously described were revealed. These results demonstrate that key ankylosis-associated proteins are expressed in early tooth germ development, providing clues about their roles in development and ankylosis.

The findings provide the crucial foundations, connections, and framework with which to continue investigation into the molecular basis of primary molar ankylosis, paving the way for future studies of protein expression in human infraoccluded molars, with the eventual goal to determine a biological target for pharmaceutical control of ankylosis.

Researchers: Roath S, Tan SS, Schneider P, Paolini R, Hardiman R

An example of the immunofluorescent staining of protein BMP5 encoded by its genes which have been found to be over-expressed in infraocclusion.

a) Hematoxylin and Eosin staining of E16
b) P1 mouse mandibular molar tooth germs in the sagittal plane with labelled associated structures of interest.

c) At maturation stage E16, BMP5 was strongly expressed in the inner enamel epithelium as well as moderately at the outer enamel epithelium, stratum intermediate, stellate reticulum, dental follicle and dental papilla.

d) At P1 BMP was strongly stained in the odontoblast and ameloblast layers, and moderately in the stratum intermediate, stellate reticulum and pulp. Scale bars are 100mm

Summary of the overall protocol used in the present study.
PROSTHODONTICS

The Prosthodontics research has a strong track record in the clinical and lab testing of dental materials. The key aim of this research group is to deliver outcomes directly applicable to current clinical practice. The clinicians and researchers in this team have established linkages with other University partners with exceptional industry relationship’s providing significant scope for high level translational research. A key focus of this group is dental implants.

THE GROUP HAS TWO PATENTS, WITH ONE PENDING ON THE RECTANGULAR BLOCK IMPLANT (RBI)

The RBI is the first dental implant developed and patented in Australia. The group has started clinical trials on the implant at the Melbourne Dental Clinic, our university run teaching clinic. This is one of three clinical trials being conducted at MDC. The RBI is designed for patients not able to receive conventional implants without extensive augmentative surgery. The group is collaborating with the Department of Mechanical Engineering to design and manufacture a matched surgical tip for this implant. After these first clinical trails the group will collaborate with an international implant manufacturer to carry out a larger multicentre study.

Researchers: Gazelakis T, Judge R, Palamara J

Associate Professor Roy Judge

Associate Professor Jaafar Abduo

Associate Professor Joseph Palamara

Micro-CT: Sagittal Slice. The mesial-distal and apical regions showed areas of implant-bony attachment as well as trabecular spaces. The apical bone showed particularly greater compaction near the implant surface (white arrows)
DENTAL EDUCATION RESEARCH

The Dental Education and Scholarship of Teaching and Learning group aim to explore how the design and implementation of learning activities, and assessment and feedback practices influence student learning. Areas of research include self-regulated learning and student engagement with pre-class learning in a flipped classroom, ePortfolio pedagogy and reflective practice, interprofessional education, dental simulation and technology enhanced learning.

BENEFITS AND BARRIERS: STUDENT ATTITUDES AND PERCEPTIONS OF DENTAL-INTERPROFESSIONAL EDUCATION

Collaborative learning between dental team members enables students to learn with, from and about one another. This promotes collaborative practice and improving patient care. This project examined attitudes of 2nd year Bachelor of Oral Health and Doctor of Dental Surgery students towards interprofessional education between members of the dental team. Findings from this project indicate that students are positive about learning together but lack an understanding of their own and one another’s roles and responsibilities in dental care. They also show a preference for shared clinical learning.

Researchers: Fakhira Selamat B, McNally C, Byrne S

EFFICACY OF DENTAL HAPTIC TRAINERS FOR THE ACQUISITION OF DENTAL SKILLS IN 1ST YEAR DENTAL STUDENTS

The study looked at evaluating the efficacy of Simodont Dental Haptic Trainers for initial training of Doctor of Dental Surgery (DDS) first year students at the University of Melbourne. Students were divided into two groups, with one group practising with the Simodonts and the other group practised with traditional blocks. Student-perceived proficiency and confidence were evaluated pre- and post-study via surveys.

Preliminary findings suggest that students highly value and engage with simulation effectively. Incorporating simulation-based teaching programs may accelerate student competency and enhance learning.

Researchers: Polster A, Cham M K

Students should be provided with collaborative learning experiences early in their courses. These findings inform curriculum design for interprofessional education between dental team members.
ORAL HEALTH PROMOTION AND CULTURAL COMPETENCE

The focus of this group is research addressing inequalities in oral health in underserved communities, including Indigenous, migrant, people living with mental illnesses, low income, and rural communities. This encompasses partnership work to develop oral health promotion and interventions addressing the barriers to oral health and access to care. Major projects are around oral health for rural remote and Indigenous communities- Indigenous community consultation and oral health needs assessment for rural communities; and workforce development- preparedness for practice of dental students, a national dental curriculum for Indigenous cultural safety, and the evaluation of practice of oral health practitioners.

EMPATHETIC, PERSISTENT, AND FEMALE: A SNAPSHOT OF ORAL HEALTH THERAPY STUDENTS IN AUSTRALIA AND NEW ZEALAND

Dental therapists, hygienists and oral health therapists constitute up to a third of the dental workforce in Australia and New Zealand. Personality is often explored in health professions to provide insights into traits that are conducive to workforce retention and to assist in planning and training. This study aimed to investigate the current demographic and personality characteristics of oral health students in Australia and New Zealand. Three quarters of participants (n = 336; 30% response rate; females = 90%) were single, from an urban area and 20-29 years of age. Oral health students overall portrayed high trait levels of Persistence and Cooperativeness. Cluster analysis of TCI traits identified three groups. Groups of students with high Persistence and Cooperativeness tended to be older, were working in non-dental and dental careers prior to their degree and were interested in working in regional areas after graduation. Students with high levels of persistence and cooperativeness were interested in working in regional areas after graduation, highlighting the importance of industriousness and persistence in overcoming barriers to practicing in regional areas. Further research is warranted to investigate barriers and enablers in recruitment and retention of males in a primarily female dominated profession.

Researcher: Satur J

Around half of Australia’s population do not have access to regular oral health care; the people affected are clustered among those with lower incomes and other health and social disadvantages facing the greatest barriers to oral health and with the least capacity to pay for or access dental care.
RESEARCHERS IN FOCUS
Mihiri’s PhD study determined early life risk factors for dental caries and enamel hypomineralisation and her current research program continues to build on this life course approach using large longitudinal cohort studies and extends into early life interventions, dietary habits and other drivers of poor oral health in children.

Mihiri’s approach was rewarded recently with success in the national Medical Research Futures Fund, who have funded her “Infant2Child: Targeting early nutrition to improve oral health” study that brings together collaborators from a number of institutions. This large multidisciplinary team features paediatric clinician researchers, biostatisticians, microbiologists, bioinformaticians and nutritionists, and features the use of digital technology to combat early childhood caries.

Mihiri was awarded one of two inaugural 2021 Melbourne Dental School Strategic Grants for Outstanding Women to continue to develop her collaborative research program with MCRI. She has published widely in peer-reviewed journals and presented at both local and international conferences. Mihiri is the current deputy chair of the Australian Dental Association Federal Oral Health Committee, Vice President of the Australian New Zealand Society for Paediatric Dentistry Victorian Branch and Secretary of the Paediatric Oral Health Research Group of the International Association of Dental Research.
Dr. Tami Yap is a Senior Lecturer at the Melbourne Dental School and registered Oral Medicine Specialist. Her PhD at the Melbourne Dental School involved translational research developing a novel, non-invasive screening test for detection of oral cancer based on microRNA. This work allowed Tami to collaborate with scientists from the Florey Institute, Walter and Eliza Institute and La Trobe University and clinical centers, Royal Dental Hospital of Melbourne, and the Royal Melbourne Hospital, investigating extracellular vesicles in a novel sample type and next generation sequencing of low yield diagnostic samples. Concurrently, Tami developed a joint clinical-industry project between Melbourne Health, the Royal Dental Hospital Dermatology & Diagnostic Microbiology Departments and industry partner, Genetic Signatures Ltd.

In continuation of the oral swirl-based microRNA research foundation from her PhD, Tami has established and lead a collaborative project with Flinders Medical Centre and Flinders University in addition to Melbourne Health in the project “Specificity of a non-invasive oral cancer test in patients with cancer beyond the oral cavity.” This project was awarded competitive funding by both the ADRF and ANZHNCS. Tami was awarded one of two inaugural 2021 Melbourne Dental School Strategic Grants for Outstanding Women to continue to develop her collaborative research program with MCRI.

Further, Tami has initiated and lead the MouthMap™ project, a collaboration between the University of Melbourne, Optiscan Imaging Ltd. and MoleMap™. Tami was awarded a prestigious Dean’s Innovation Grant from the Faculty to develop the project. This project includes clinicians from the Victorian Comprehensive Cancer Center alliance investigating the use of noninvasive digital and molecular tools to augment early detection of oral cancer. This project, partnering the Melbourne Dental School with OptiScan Ltd, a Victorian company, has been awarded a grant of almost $1 million through the Medical Research Future Fund for a collaborative clinical research project to improve screening and early diagnosis of oral cancer. For this project, Tami has a collaboration with Thomas Reiner’s lab at Memorial Sloan Kettering in New York City. This group has developed a molecular targeted fluorescent topical formulation called PARPi-FL, which targets cancer cells. She will soon be testing this molecule for its utility in the identification of oral cancer and oral precancer.
Leanne has recently been chosen to represent Australia in an International Massive Online Open Course on dental antibiotic use with the World Dental Federation, where participants were chosen from each continent.

LEANNE TEOH, PHD PROGRAM

Despite Dr. Leanne Teoh’s short time starting research, she has pioneered research on dental antibiotic resistance in Australia, established herself as a global leader in this area, and built an international network of collaborators.

Dr. Teoh is both a registered Dentist and Pharmacist who commenced her PhD in the Melbourne Dental School in September 2017, graduating in March 2021. In this time, while maintaining clinical roles as a dentist and pharmacist, co-ordinating the dental therapeutics program at Melbourne Dental School, lecturing students, and starting her PhD when her son was 2 months old, she has authored 27 peer-reviewed research publications, 23 as first author and 12 research articles, an outstanding record of achievement. Leanne has shown both high research output and quality relative to opportunity and early career stage and was the first student to win the Ernest Joske Research Award for publications and research impact (traditionally awarded to established researchers).

Leanne has secured funding grants from the Australian Dental Research Foundation and U Melbourne RIC department for this proposed project, and recognition as a co-inventor of drugs4dent - the dental prescribing tool in this research proposal.

Leanne has quickly established herself as a global leader, evidenced as an invited speaker on multiple occasions at the National Centre for Antimicrobial Stewardship, the Australian Government Therapeutic Goods Administration and World Dental Congress. She is part of the Australian Dental Association Therapeutics Committee, involved in making decisions regarding medicines for the Australian dental profession, a founding member and invited speaker at the launch of the Global Antimicrobial Resistance Dental group at the recent International Association for Dental Research conference. Leanne has recently been chosen to represent Australia in an International Massive Online Open Course on dental antibiotic use with the World Dental Federation, where participants were chosen from each continent. Finally, Leanne is part of an international steering committee establishing core outcome sets for dental antimicrobial stewardship with the World Dental Federation, where participants were chosen from different parts of the world for their specific skillsets.
The Melbourne Dental School offers undergraduate students the opportunity to undertake a research-based Honours degree in the Bachelor of Biomedicine, Bachelor of Science or the Bachelor of Oral Health, and postgraduate students can undertake a Master of Biomedical Science or PhD. The broad range of scientific endeavour from basic science to clinical studies to population health within the MDS embraces various disciplines including microbiology, immunology, cancer cell biology, biochemistry & molecular biology, chemistry, anatomy, cell biology, public health and materials engineering. Our research also extends well beyond oral health and dentistry into broader fields of wound healing, drug delivery, orthopaedics and microbiomics. Working closely with our researchers, students undertake their project in state-of-the-art research laboratories at the Melbourne Dental School and Bio21 Institute with access to cutting edge scientific platforms. One of our recent Bachelor of Biomedicine (Honours) students, Jordan Blum, came second in the 2021 global International Association for Dental Research Hatton Award (see below).

Melbourne Dental School
2022 Honours & Master Biomedical Science Research Project Handbook

https://tinyurl.com/3p323aev
AWARDS AND HONOURS

PROFESSOR ALASTAIR SLOAN

2021 IADR Isaac Schour Memorial Award

Professor Alastair Sloan has been named as the 2021 recipient for The International Association for Dental Research (IADR) Isaac Schour Memorial Award. The Isaac Schour Memorial Award recognizes outstanding scientific contributions in the anatomical sciences, including tissue engineering, tissue regeneration and stem cell research as it relates to the oral, dental, or craniofacial complex. It is one of the 17 IADR Distinguished Scientist Awards and is one of the highest honours bestowed by IADR. Prof. Sloan has also been elected Honorary Fellow of the International College of Dentists and awarded an Ad Eundem Fellowship of the Faculty of Dentistry, Royal College of Surgeons Ireland.

PROFESSOR ERIC REYNOLDS

98th President of the International Association for Dental Research

Melbourne Laureate Professor Eric Reynolds has been inducted as President of the International Association for Dental Research (IADR). He becomes the 98th President of a society that numbers more than 10,000 members worldwide. Eric is the first Australian to be elected as President.

In addition, Laureate Professor Eric Reynolds, has also been awarded the 2020 European Organisation for Caries Research Prize for outstanding contribution in the field of cariology and the 2020 American Academy of Periodontology Clinical Research Award for research on Porphyromonas gingivalis and Alzheimer’s Disease published in Science Advances.
MR JORDAN BLUM
International Association for Dental Research
Hatton Award, SECOND PLACE
Mr Jordan Blum, a Bachelor of Biomedical Sciences (Honours) student in the Melbourne Dental School, was the recipient of a 2021 prestigious global IADR Hatton award for his research entitled “Breastmilk Influences the Bacterial Diversity of the Infant Oral Microbiome”. Jordan demonstrated that there was a significant difference in the bacterial communities in the oral cavity of infants who received breastmilk compared to infants who were never breastfed, and this difference persisted after cessation of breastfeeding. Jordan was supervised by Dr. Catherine Butler, Dr. Samantha Byrne, Mr. Geoff Adams and Prof. Stuart Dashper and is now undertaking a Doctor or Dental Surgery degree in the School.

DR ANTONIO CELENTANO
IADR Oral Biology Award for excellence in the field of oral biology
Dr Antonio Celentano was awarded on the basis of excellence in research in the broad field of oral biology. This includes studies in the oral and dental tissues over the whole range of vertebrates, relating to anatomy, biophysics, chemistry, epidemiology, genetics, immunology, microbiology, molecular biology, palaeontology, pathology, and physiology.

PROFESSOR IVAN DARBY
New editor of the prestigious Australian Dental Journal
Professor Ivan B Darby has been announced as the new editor of the prestigious Australian Dental Journal. He will be taking over from long-time incumbent Professor Mark Bartold. Ivan brings a wealth of experience to the role, including as a member of the editorial advisory board of the Journal since 2009, as an editor of the ASP journal, Periodontology from 2006 to 2016 and as current editor of the Australian Journal of Periodontology and Implant Dentistry. The Australian Dental Journal currently sits in the top 50 dental publications worldwide.

MELBOURNE DENTAL SCHOOL
PROFESSORS FEATURED IN THE STANFORD TOP SCIENTISTS WORLD RANKINGS
Laureate Professor Eric Reynolds and Professor Martin Tyas are both featured in the top 2 percent of scientists in dental research. In the Stanford study published in PLOS Biology in 2021, scientists were ranked according to an index that measured their scientific research output, citations to papers in different authorship positions, and a composite indicator.
A collaborative, school-wide event, the inaugural MDS Research Festival celebrates the world-class clinical, research and education capabilities that make Melbourne Dental School unique in Australia, and an acknowledged global leader.

Research from the BOH, DDS, DCD and honours and Graduate Research programs were presented in a range of dynamic formats, from a research protocol forum to 3MT competition and virtual poster presentations.

With innovative virtual formats including a virtual poster session in a virtual room there was plenty of opportunity for interaction and sharing of ideas. The festival was an opportunity to connect with colleagues and support our student researchers.

Participants entered as avatars and visited rooms set up with research posters and presentations. Avatars (participants) walked around, read posters, listened to presentations, and chatted with other avatars.

The showcase was a huge success featuring IMPACT research projects presented by our students!
OUR SHOWCASE WINNERS!

ORTHODONTICS

Spatial and temporal expression of candidate proteins involved in tooth ankylosis in mouse tooth terms

SARAH ROATH, DCD STUDENT

Sarah presented her Doctor of Clinical Dentistry research as part of the School’s Colgate IADR Travel award competition. Sarah won in her category and presented her research at the virtual Australia New Zealand Division of IADR conference in September 2021. She won this competition and will now present her work at the global IADR conference in July 2022 as a competitor in the prestigious Hatton Award.

Primary molar ankylosis, the pathologic fusion of teeth to the surrounding bony socket, often results in deleterious consequences in adjacent teeth and bone, especially in actively growing individuals. Little was known about the aetiology and pathogenesis of primary molar ankylosis until recent studies demonstrated a series of genes that were differentially expressed in the furcal bone and periodontal ligament of infraoccluded primary molars.

The present study aimed to investigate the temporospatial expression of six key proteins (with genes differentially expressed in ankylosed primary molars) during tooth germ development, to provide clues about their possible functions during development, and their contributions to ankylosis. Please refer to page for further project coverage.

PAEDIATRICS

Photobiomodulation Therapy for the prevention and management of oral mucositis

JOSEPH RYAN, DCD STUDENT

Oral Mucositis is inflammation of the oral mucous membrane, which may clinically exist with or without ulceration or sores. The major causes of OM are high dose interventions such as chemotherapy (CT) or radiotherapy (RT) used for treating head and neck (H+N) cancer or before haemopoietic stem cell transplantation (HSCT).

The primary aim of this project was to determine if the use of photobiomodulation therapy (PBM therapy)/ Low Level Laser Therapy (LLLT) will result in an overall reduction in oral mucositis incidence.

Findings from this project when comparing to expected outcomes as demonstrated by the literature shows that prophylactic PBM therapy appears to offer a possible effective therapy in the prevention and management of oral mucositis in patients undergoing high dose radiation therapy. (Figure2) With regards to the presence and severity of OM this project demonstrated that when PBM therapy is employed we see a reduction in the OM expected.

PAEDIATRICS

The influence of early dietary free sugar intake on dental caries: Findings from a prospective study of Australian children

STEPHANIE HEITKONIG, DCD STUDENT

Free sugar intake is an important risk factor for non-communicable diseases such as dental caries. Current guidelines recommend that free sugar should constitute less than 10% of total energy intake (TEI). A more stringent limit of 5% TEI is likely to be beneficial but does not have a robust evidence base.

The study aims to investigate the effect of free sugar intake on dental caries at age 4-6 years and whether a TEI of less than 5% free sugars reduces dental caries risk.
ASSOCIATE PROFESSOR ROY JUDGE

MDS is a highly collaborative and outward looking organisation that has considerable established internal academic and industry partnerships. MDS is undertaking several new international initiatives with a view to increasing its global engagement and research collaborations. Some of these are outlined below.

DENTALLIANCE

Four global leaders (University of Melbourne, Chapel Hill, King’s College London, and National University Singapore) have instigated a unique agreement to collaborate across three domains of Research, Teaching & Learning and Continuing professional development. The four Deans with the international leads meet on a monthly basis to support each of the very active DentAlliance domains.

The research group of DentAlliance is hosting an online workshop for early career researchers in November 2021. This fantastic opportunity will allow participants to share and collaborate with colleagues across the four partner universities. The first workshop will be focused on periodontics with further workshops already planned for Q1 2022.

The Teaching and Learning group have developed an online student exchange program allowing for academic discourse between individuals that will enrich their student experience. The CPD group have launched an online seminar program and live QA leading to face-to-face workshops to be hosted at each of the centres.

THE NEW CLINICAL MASTER’S PROGRAM

MDS is developing a new one-year clinical Masters for general dental practitioners. This program will allow candidates to undertake clinical coursework under supervision as well as research in their chosen clinical field. The business case for this new course has been approved at the faculty level and the school this progressing to approvals via the academic programs committee. The pilot disciplines for this new program will be Prosthodontics and Periodontics with a view to expand across all the specialities. Students undertaking this program will have an opportunity to inform clinical and research career paths at the completion of this program.

BACHELOR OF MEDICAL SCIENCE

A highly successful relationship between the Melbourne Medical School and Universitas Indonesia has allowed generations of Indonesian students to undertake a research-based degree in Melbourne over the last 20 years. In 2022 MDS and MMS will co-deliver the first dental cohort of this research-based degree for UI students. During 2021 MDS senior teaching and research academics have delivered a significant lecture-based program for UI further developing a key regional relationship with this University partner.

“MDS is undertaking several new international initiatives with a view to increasing its global engagement and research collaborations.”
COLLABORATIONS
MELBOURNE

Parkville
1 Walter and Eliza Hall Institute
2 Peter MacCallum Institute (VCCC)
3 Peter Doherty Institute
4 Faculty of Engineering and IT - Department of Biomedical Engineering & Department of Chemical Engineering
5 School of Population and Global Health
6 School of Psychological Sciences
7 Florey Institute for Neuroscience and Mental Health
8 Murdoch Children’s Research Institute
9 Melbourne Integrative Genomics
10 Dental Health Service Victoria
11 Monash University Biomedical Translation Bridge (BTB) Program, RBI, Cremorne
12 CSIRO, Canberra
13 Curtin University, Western Australia
14 Deakin University, Geelong
15 Defence Science & Technology Group
16 Department of Health, Barwon Health
17 Griffith University Queensland
18 Hudson Institute of Medical Research
19 James Cook University, Queensland
20 La Trobe University, Bundoora
21 ORYGEN Youth Health, Parkville
22 Queensland University of Technology, Queensland
23 Royal Children’s Hospital, Parkville
24 Royal Melbourne Hospital, Parkville
25 Royal Women’s Hospital, Parkville
26 St. Vincent’s Hospital Melbourne, Fitzroy
27 University of Adelaide, SA
28 University of New South Wales
29 University of Queensland
30 University of South Australia
31 University of Sydney, Camperdown
32 University of Western Australia, Crawley
33 Layhapuy Homelands Corporation & Top End Health Services - East Arnhem Land NT
34 Miwatj Health Aboriginal Corporation
35 Aboriginal Community Controlled Health Organisations and NT Government Oral Health Service East Arnhem Oral Health Plan
36 Rumbalara Aboriginal Corporation
37 Rumbalara AC, Mooroopna Victoria
38 Rumbalara Community Consultation on Oral Health
39 Shire of Moira
40 Moira rural shire, Victoria
41 NCN Oral Health Needs Assessment
FOCUS ON PUBLICATIONS

The Melbourne Dental School publishes a great breadth and depth of research every year in some of the finest academic journals in the world. Here are three examples from the 2020 – 21 that give an insight into the quality and variety of our research.

TERIPARATIDE PROMOTES BONE HEALING IN MEDICATION-RELATED OSTEONECROSIS OF THE JAW: A PLACEBO-CONTROLLED, RANDOMIZED TRIAL

MDS Researchers Assoc. Prof. Mina Borromeo, Dr Rita Hardiman and their PhD student Dr Le-Wen Sim recently published their study "Teriparatide Promotes Bone Healing in Medication-Related Osteonecrosis of the Jaw: A Placebo-Controlled, Randomized Trial" in the highly prestigious Journal of Clinical Oncology. The double-blind, randomised, placebo-controlled trial was designed to study the efficacy and safety of teriparatide, an osteoanabolic medication that has been shown to promote bone growth and healing in periodontitis, as a treatment for established medication-related osteonecrosis of the jaw.


CHEMICALLY MODIFIED AND CONJUGATED ANTIMICROBIAL PEPTIDES AGAINST SUPERBUGS

A collaboration between MDS Researchers Prof Neil O’Brien-Simpson, Dr Wenyi Li with University of Melbourne Prof Frances Separovic and Prof John Wade from the School of Chemistry and the Florey Institute of Neuroscience and Mental Health, has resulted in the publication of an invited review "Chemically modified and conjugated antimicrobial peptides against superbugs" in one of the World’s top cited journals, the highly prestigious Chemical Society Reviews. This in-depth review provides an analysis of how to chemically modify antimicrobial peptides and how this affects their antimicrobial activity towards bacteria, this will provide researchers with a reference tool to use in their own studies in tackling the major health threat of antimicrobial resistance. Their work was highlighted as a front cover of the issue with artwork by Ms Ruadh O’Brien-Simpson.


OROFACIAL IMPLICATIONS OF SARS-COV-2 INFECTION AND COVID-19 VACCINES

MDS Researcher Prof. Nicola Cirillo has contributed to the scientific understanding and public awareness of the orofacial implications of SARS-CoV-2 infection and COVID-19 vaccines, including the first report of smell and taste alteration as the sole clinical manifestation of SARS-CoV-2 infection in an otherwise healthy patient. In another example, he published the first case of facial paralysis post COVID-19 vaccination in the Journal of Neurology and his considerations on the incidence of the disease in vaccine recipients appeared in the Lancet Infectious Diseases. In recognition of his contribution to the field, the Lancet editorial team later invited Prof. Cirillo to discuss the state-of-the-art of the association between Bell’s palsy and COVID-19 vaccines.

2020 PUBLICATIONS


**2020 PUBLICATIONS**


2020 PUBLICATIONS


2020 PUBLICATIONS


2020 PUBLICATIONS


Wong T, Yap T, Wiesenfeld D (2020). Common benign and malignant oral mucosal disease. AUSTRALIAN JOURNAL OF GENERAL PRACTICE 49(9): 568. 0

Wong T, Yap T, Wiesenfeld D (2020). Common causes of ‘swelling’ in the oral cavity. AUSTRALIAN JOURNAL OF GENERAL PRACTICE 49(9): 575. 0


2021 PUBLICATIONS


2021 PUBLICATIONS


doi:10.1177/00220345211049319


2021 PUBLICATIONS


Veith PD, Scott NE, Reynolds EC. (2021). Characterisation of the O-glycoproteome of Tannerella forsythia. mSphere doi.org/10.1128/mSphere.00649-21


ACS Infect Dis: Lin, B ; Li, R; Handley, T; Wade, J.D.; Li, W; O’Brien-Simpson, N.M.. Cationic antimicrobial peptides leading the way to combat oropathogenic infections. ACS Infectious Diseases. 2021. Accepted
Research in the Melbourne Dental School is supported by funding from major Nationally competitive funding bodies including the National Health and Medical Research Council, the Medical Research Futures Fund, and the Australian Research Council. In addition, there is significant funding for translational research.
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Our researchers are at the forefront of international scholarship in fields as diverse as human rights law, climate change, telecommunications, and medical research. We’re here to help you find researchers and collaborators.

ACKNOWLEDGEMENT

The Melbourne Dental School (MDS) would like to acknowledge all staff, researchers and individuals for their support and contribution towards this research report. We would also like to specially thank:

Professor Stuart Dashper, Director of Research, MDS
Professor Alastair Sloan, Head of School, MDS
Ms Alissa Arpaci, Research Support Officer, MDS / Editor, MDS Annual Research Report 2020/2021
Ms Jelena Hendricks, Executive Assistant/Office Manager, MDS
MDS Research Staff and Students