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Introduction from the Dean



This is the second *Research Report* of the Sir John Walsh Research Institute and it is again an honour to write this introduction. The Institute within the Faculty of Dentistry at the University of Otago continues to provide a focus for dental research, not only within New Zealand, but also within the Pacific; as such, it provides the research base underpinning the professions of dentistry in New Zealand. The Institute draws together the research strengths in Oral Biomechanics (including Dental Biomaterials, Oral Implantology and Forensic Dentistry), Dental Education Research, Dental Epidemiology and Public Health, Molecular & Immuno-Oral Pathology and Molecular Oral Microbiology. With the appointment of new staff, it is likely that these groups will grow and new ones emerge as the Faculty evolves and the needs of the Oral Health professions change as we move into the 21st century.

The Institute has already hosted a number of international visitors and has developed a Memorandum of Understanding with Chulalongkorn University in Thailand. Chulalongkorn University is not only Thailand's oldest University but also one of the most prestigious in Asia, and it is appropriate that the Institute develops relationships with high-ranking Universities in the Asia-Pacific region.

The Sir John Walsh Research Institute, however, continues to focus on the needs of the dental professions in New Zealand. With your continuing support and commitment to dental research in this country, the oral health (and hence general health) of all New Zealanders will be based on a firm footing.

I congratulate Professor Jules Kieser and all those involved in the Institute on their achievements thus far and wish them all the best for the future.

A handwritten signature in blue ink, appearing to read 'Gregory J Seymour'.

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Report by the Director



The creation of knowledge through scholarship, research and invention is a fundamental requisite of a university. Research projects also provide distinctive learning opportunities for undergraduate and graduate students, and research funding drives both Faculty and Departmental development.

The University of Otago is recognised as the leading research institution in New Zealand. Within the University, the Sir John Walsh Research Institute (SJWRI) of the Faculty of Dentistry is committed to enhancing research in a broad range of areas. While the primary goal of research is to generate new knowledge and to translate that knowledge for the benefit of humankind, a sense of excitement and enquiry ensures that researchers are able to pursue research in areas of their own choosing, subject to compliance with ethical requirements and economic constraints. With this in mind, the SJWRI has identified a number of strategic interdisciplinary research areas in consultation with key stakeholders:

- ~ Biomechanics and Oral Implantology;
- ~ Dental Epidemiology and Public Health;
- ~ Education Research;
- ~ Oral Molecular Immunopathology; and
- ~ Molecular Microbiology.

In fostering these complementary strengths, we cultivate a research culture that supports innovation and ultimately leads to discoveries that will transform our profession.

I am proud and pleased to present the biennial Research Report of the SJWRI. Measuring research excellence is highly challenging, requiring a balance between quantitative and qualitative measures, together with an appreciation of the unique needs of the New Zealand population. For individual researchers, important outcome measures include the number of refereed articles or book chapters published, levels of external funding obtained, presentation at significant professional conferences and involvement in the evaluation and editorial management of manuscripts or research grants. Additionally, participation in professional associations, as well as success in translating research into improved health outcomes depends on individuals working together in broader thematic areas of specialisation. Of course, all of this occurs in the context of research-informed teaching, which enhances the student experience at the Faculty of Dentistry at both undergraduate and postgraduate levels.

Notwithstanding the economic downturn, research enterprise at the SJWRI continues to flourish – a measure of the dedication and talent of our extraordinary faculty and researchers. We received \$4,181,278 in research funding from internal and external sources in the past two years, surpassing the previous two years' funding by \$937,562. Despite the funding challenges presented during the past two years, we advanced research in a number of important fields, including: developing immunological technologies to detect, prevent, and counter periodontal disease; expanding our knowledge on clinical implant placements; finding answers to questions about tongue and lip function during swallowing; adding to health services research and knowledge of the epidemiology and natural history of oral conditions; and investigating the role of microorganisms in oral diseases.

Through joint programmes and collaborative efforts, ties between the Institute and local and overseas laboratories have never been stronger. The creative energy generated by these relationships has benefited our students, the local research community and, from the standpoint of clinical dentistry, the profession at large. This report illustrates, highlights and celebrates our success in developing outstanding research, to the benefit of both the Faculty and New Zealand as a whole.

Jules Kieser

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Sir John Patrick Walsh KBE



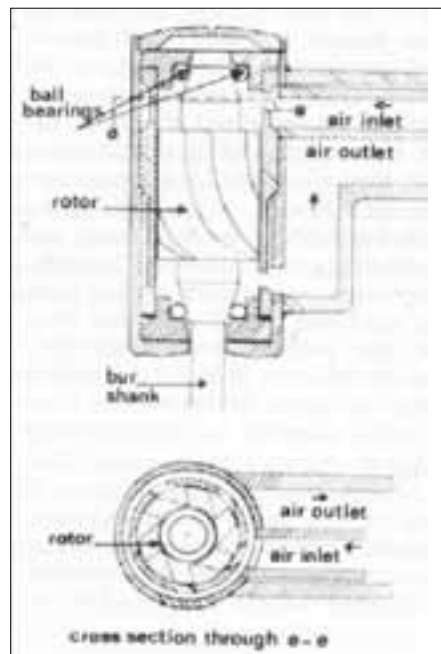
MUCH GAIN AND MINIMISED PAIN

Sir John Walsh made such a remarkable contribution to dentistry in New Zealand that Chapter 8 of Tom Brooking's "A History of Dentistry in New Zealand" is entitled the "Walsh Era 1947-1972." After graduating with a first class honours degree in dentistry (followed by a medical degree), and then serving as a medical officer in the Royal Australian Air Force, this self-described "brash Australian" was appointed as the 3rd Dean of the School of Dentistry at the University of Otago in 1946. Walsh's appointment advanced dentistry at many levels. He served as a spokesperson for dentistry at the World Health Organisation, led a campaign that overcame vociferous opposition to fluoridate water supplies in New Zealand cities, and succeeded after 10 years of struggle with reluctant university authorities (and even more reluctant government) to build the iconic glass curtain building that now houses the Faculty of Dentistry and bears his name. Under his leadership, the Faculty of Dentistry obtained the highest international standards by broadening its clinical and scientific base and reaching out to the dental profession and the community. Walsh edited the *New Zealand Dental Journal* for several years and had a reputation for being extremely scathing about dental practices that equipped too many New Zealand adults with "false teeth faces" in the mid-20th century. Walsh was a powerful advocate of research. Staff members in the Faculty of Dentistry were encouraged to undertake PhD study, and the School of Dentistry set out to "grow" its own researchers by introducing the highly successful MDS graduate programme. This focus on research was achieved with the support of Walsh's ally, Sir Charles Hercus in the Medical School (also a dental graduate). After more than 50 years, the MDS degree has been replaced by the Doctorate in Clinical Dentistry (DClinDent). Most importantly, this change will increase the research experience and clinical expertise of graduates in a world where biological knowledge and its impact on clinical practice are changing at an unprecedented rate. This initiative to improve and more fully inform dental practice through research would undoubtedly have been endorsed by Walsh.

Sir John Walsh's contribution to the development of the modern high-speed dental handpiece was one of his most significant but least well-known achievements. Electric drills introduced near the beginning of the First World War were inefficient and, by operating at only about 3000 rpm, caused considerable discomfort to patients. While testing the hearing of Australian airmen discharged from service at the end of World War II, Walsh not only identified frequencies that caused pain but also those that did not. This led to the hypothesis that the vibrational frequencies imparted by dental drills rotating at sufficiently high speeds would minimise patient discomfort. With the assistance of H.F. Simmons from the University of Otago Department of Physics, an existing air-powered low-speed drill was modified to operate initially above the 42,000 rpm vibrational threshold and then at 60,000 rpm. In 1947, Walsh persuaded the Ministry of Science and Industry to underwrite the development of the air turbine handpiece at the Dominion Physics Laboratory in Lower Hutt. By 1949, a prototype was made available to Walsh, who then obtained the results that contributed to his DDSc from the University of Melbourne and to the issue of a New Zealand patent. Although the prototype overcame the pain problem and required minimal operator force to work efficiently, its high-pitched noise, excessive exhaust of air into the patient's mouth, and the too-frequent seizure of its primitive bearings (due to overheating) made it difficult to obtain further support from government or commercial sources. In 1952, Walsh's research on the air turbine handpiece ceased due to lack of funding. American and Swedish research had overcome the technical problems by about 1955 and, in 1957, the Borden Airtor was marketed by the Dentists' Supply Company. R.J.

Nelson, who had produced a water- and powered cooled contra-angle handpiece, was then promoted (with the editorial support of the Journal of one of his sponsors, the American Dental Association) as being solely responsible for the development of the high-speed drill. The precedence of Walsh's development of a high-speed air turbine handpiece that closely resembles the modern-day device can be gleaned from the pages of the *New Zealand Dental Journal* and a summary in the *British Dental Journal* (136, 469-472, 1974). The parallel drawn by Tom Brooking on the Walsh and Nelson contributions to dentistry with those of Richard Pearse and the Wright brothers to powered flight seems quite apt.

Walsh's attitude to research was very modern in its inclusiveness, while many of the barriers he faced in bringing its products into the clinic remain difficult to overcome. Walsh took a multidisciplinary approach to problems; he recruited the best people and obtained the best from them; he understood the risk inherent in cutting-edge research and didn't expect research or commercialization to be easy; and he came to understand that the perspectives of companies and politicians are often myopic. Not fazed by the disappointment of being unable to advance the high-speed handpiece further; Walsh worked hard to expand research activity within the Faculty of Dentistry by attracting research funding, establishing the Biochemical Research Unit at the Dental School in 1960, and supporting an electron microscopy suite. It is therefore fitting that the University of Otago acknowledged his contribution to research in dentistry by supporting the establishment of the Sir John Walsh Research Institute in the Faculty of Dentistry. The Institute's roles in research and communication with the profession and wider community seek to improve the oral health of New Zealanders, a modernisation of Walsh's aspiration of giving people "teeth for life".



A patent drawing of the air turbine handpiece design



Prototype handpieces

Publication Numbers 2009-2010

To avoid double counting, unique publication counts are used when a publication has authorship from more than one department; for example, for a publication with authors from more than one department, each department's contribution is allocated proportionately.

| | | 2009 | 2010 |
|--|------------------------------------|-------------|-------------|
| Dentistry (Dean's Department) | Book | | 0.3 |
| | Book Chapter | 1.7 | 0.3 |
| | Conference Contribution – Other | 7.4 | 1.0 |
| | Conference Contribution – Refereed | 5.1 | 7.0 |
| | Journal Article – Other | 2.0 | 0.3 |
| | Journal Article – Refereed | 8.9 | 9.0 |
| | Other work | 1.2 | 0.5 |
| | Thesis | | |
| Dentistry (Dean's Department) Total | | 26.2 | 18.3 |
| Oral Diagnostic & Surgical Sciences | Book Chapter | 1.0 | 0.3 |
| | Conference Contribution – Other | 7.3 | 4.5 |
| | Conference Contribution – Refereed | 2.8 | 4.3 |
| | Creative work | | |
| | Journal Article – Other | 1.0 | |
| | Journal Article – Refereed | 5.8 | 6.3 |
| Oral Diagnostic & Surgical Sciences Total | | 17.9 | 15.4 |
| Oral Rehabilitation | Book Chapter | | 1.8 |
| | Conference Contribution – Other | 18.8 | 5.0 |
| | Conference Contribution – Refereed | 12.4 | 7.3 |
| | Journal Article – Other | 3.5 | |
| | Journal Article – Refereed | 18.9 | 23.0 |
| | Other work | | |
| Thesis | 1.0 | | |
| Oral Rehabilitation Total | | 54.6 | 37.0 |
| Oral Sciences | Book | | 0.7 |
| | Book Chapter | 0.8 | 7.0 |
| | Conference Contribution – Other | 11.0 | 8.8 |
| | Conference Contribution – Refereed | 18.4 | 17.5 |
| | Journal Article – Other | 3.2 | 1.3 |
| | Journal Article – Refereed | 24.2 | 24.8 |
| | Other work | 0.3 | 3.5 |
| Thesis | | | |
| Oral Sciences Total | | 57.8 | 63.5 |

Source: Publications/Outputs Office: Research and Enterprise Office, University of Otago

Research Programmes

Biomechanics and Oral Implantology

Programme Leaders: Professor Michael Swain and Professor Jules Kieser

INTRODUCTION

Practical biomechanical innovation is how we describe our approach to research. The term biomechanics, much like similar hybrid terms such as bioarchaeology or biophysics, covers an area of knowledge that involves the application of a specific discipline to an aspect of biology. Craniofacial biomechanics is focused on the application of engineering principles to dentofacial structures and tissues. Our research programme strives to develop solutions that have real benefits for both the public and the profession of dentistry in New Zealand and around the world. The area of biomechanical research has established a reputation for investigations in basic as well as clinical fields, ranging from novel implant systems to forensic science.

Members of our research team focus on a number of related areas of expertise to undertake relevant research and build strategic partnerships, as well as educating both under- and post-graduates who are ready to enter their chosen profession. Collaborations both within and outside of New Zealand bring together researchers from universities, government laboratories and industry to achieve real outcomes of national economic and social significance. The major themes of research within our programme include dental biomaterials, natural soft and hard tissues, bioforensics and implantology.

CURRENT RESEARCH

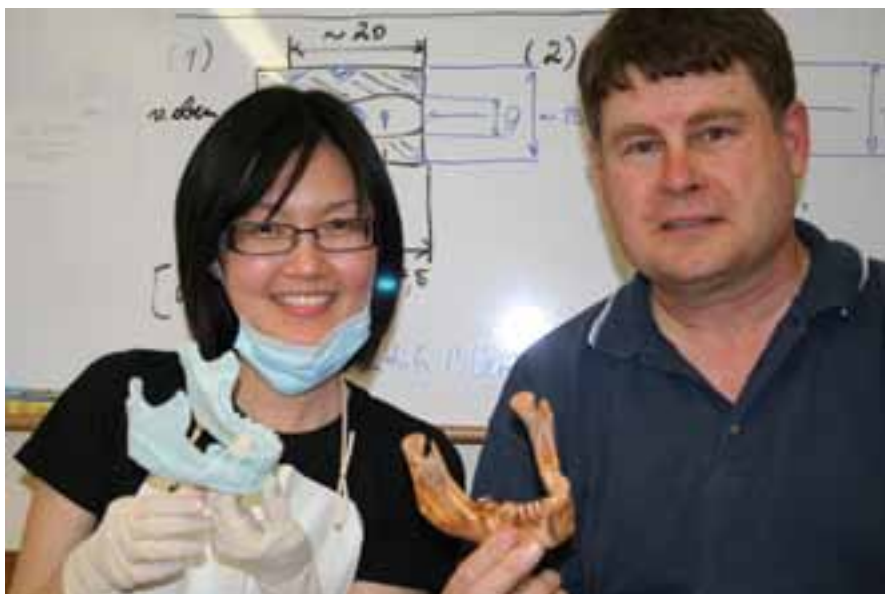
Our research is aimed at defining and understanding the oral design environment. It examines the entire system, from basic structures such as enamel and bone to the fabrication of various materials and appliances used in clinical dentistry, including:

- the structure and material properties of oral tissues and their responses to biological forces;
- failure mechanisms of implant supported prostheses;
- adhesion and design features of modern dental restorations;
- the structure of dentine and enamel in reptiles and dolphins;
- enamel hypoplasia;
- tongue pressure dynamics in the mouth;
- artificial saliva; and
- sharp and blunt force injuries to craniofacial structures.

RESEARCH ACTIVITIES

Activity 1. Dental Materials

Description: Evaluating specific issues associated with the range of dental materials from composite resin systems to advanced ceramics.



Yeen Lim and Neil Waddell modelling the mandible of a neanderthal and comparing it to modern day humans.

Aim: Provide basic information about these materials that enables a better basis for understanding their usage in clinical settings.

Source(s) of funding: New Zealand Dental Association Research Foundation and the Fuller Scholarship for Dentistry.

Outcomes during 2009-2010: 24 journal articles were published; 6 DCLinDent, 1 MDentTech and 2 BDentTech(Hons) graduates.

Activity 2. Soft and hard tissue biomechanics and forensic biology

Description: Investigating the basic properties of skin, teeth and bone related to the craniofacial region and forensic issues.

Aims: Teeth and bone are special in that they preserve a record of their formation in the adult end-product. Hence, an examination of adult morphology can be used to reveal some of the processes that were involved, as well as some of the perturbations of such processes. This knowledge can then be linked to clinical findings that will (hopefully) result in better therapeutic outcomes. Our research has mainly been focused on the structure and function of enamel in different species, the forces generated during swallowing, and the behaviour of skin and bones during traumatic events.

Sources of funding: New Zealand Dental Association Research Foundation, United States Department of Justice, ESR Capability Development Fund.

Outcomes during 2009-2010: DCLinDent Daniel Kennedy, Nitin Raniga; MSc Gemma Radford, Shelley Kemp, Francis Daroux.

Activity 3. Implantology and associated superstructures

Description: Our research teams have expertise with respect to conducting clinical (human) and preclinical (animal) trials and laboratory-based research relating to oral implants. Currently, funded research is being conducted into different oral implant systems, materials, surfaces, superstructures, and surgical and restorative protocols, as well as supporting biological and regenerative products. Graduate student research during 2009-2010 included immediate placement and/or loading of single implants and implant-supported over-dentures, fit of zirconia prostheses, implant analysis using micro-CT, and analysis of different implant systems and bone placement grafts in sheep femur and maxillary sinus models.

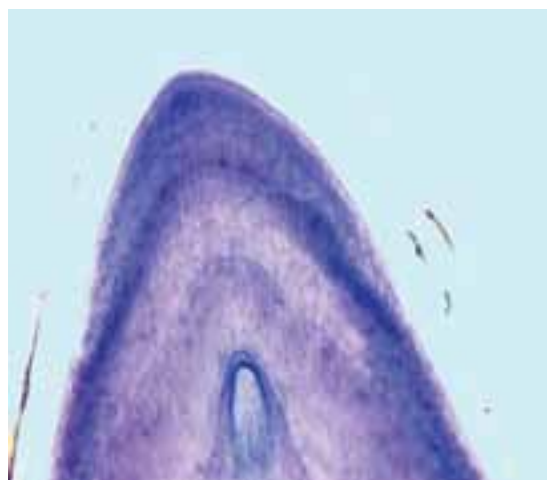
Aims: Evidence-based treatment that reduces the interval between oral implant placement and loading, by optimising the implant design and the surgical and prosthodontic protocols and materials.

Source(s) of funding: New Zealand Dental Association Research Foundation; JF Fuller Foundation; International Team for Oral Implantology ITI Switzerland; Straumann AG, Switzerland; NobelBiocare Australia; Southern Implants, South Africa; Korea Science and Engineering Foundation (KOSEF), Megagen Co Ltd., South Korea; Osstem Co. Ltd, South Korea; Neoss Australia Ltd; Keratec Ltd. New Zealand; Euroteknika France.

Outcomes during 2009-2010: MBChB/MDS: Duncan Campbell; DCLinDent: Sunyoung Ma, Simon Brown, Jaafar Abduo, Chae Park; PhD: Nabeel Alsabeeha.

KEY PERSONNEL

Professor Mike Swain
Professor Jules Kieser
Professor Mauro Farella
Assoc. Professor Bernadette Drummond
Dr Vincent Bennani
Dr Warwick Duncan
Dr Andrew Quick
Dr Lihong He
Mr Neil Waddell
Mr Ludwig Jansen van Vuuren
Dr Rami Farah, funded by a University of Otago Postdoctoral Scholarship (2007-2009)



Dental Epidemiology and Public Health

Programme Leader: Professor W Murray Thomson

OVERVIEW

Our work has the two main strands of (1) dental epidemiological research and (2) dental health services research. *Dental epidemiological research*: in this work, we study the occurrence, determinants and natural history of the common oral conditions. To do this, we employ a number of standard dental epidemiological approaches (most notably the prospective cohort study and the cross-sectional survey) and techniques. Multidisciplinary collaboration has proven to be a very fruitful way of doing our work, as it combines the different strengths and knowledge bases of a number of researchers. *Dental health services research (HSR)*: this work is concerned with how the dental healthcare system works, and the extent to which users are benefitting from it. Key activities are measuring oral health outcomes and increasing understanding of how (and why) people use (or do not use) dental services. Our group have played an important role in the development and epidemiological validation of new measures for child oral-health-related quality of life, working in collaboration with a number of overseas researchers. We are also rapidly developing our expertise and output in the field of dental workforce research.

In September 2010, our redesignation as a WHO Collaborating Centre (CC) was confirmed for a further four-year period. It is one of only three oral health CCs in our particular WHO region; the other two are in Niigata (Japan) and Beijing (China).

KEY PERSONNEL AND COLLABORATIONS

Professor WM Thomson
Ms KC Morgaine
Dr JM Broadbent (funded by HRC grant 09/086C)
Ms DM Shearer (funded by NIH grant R03DE018716)
Dr LA Foster Page

Our collaborations are very important to the work and impact of the group. Current collaborations include institutions in New Zealand, Australia (the Universities of Adelaide and Melbourne), Canada (the University of Toronto), the USA (Duke University and the University of North Carolina), Britain (GKT Dental Institute, the University of London), and Brazil (University of Santa Catarina, Florianopolis).

POSTGRADUATE STUDENTS

During this period, there were 6 DCLinDent students, 1 PhD and 3 Masters students being supervised. In addition, 4 DCLinDents, 4 PhDs and 2 MComDents were supervised to completion.

RESEARCH ACTIVITIES

Activity 1. Life-course research in oral health (the Dunedin Study)

Description: Prospective observational research into the natural history of oral health and disease in a representative birth cohort now in adulthood.

Aim: Unprecedented information on the natural history of oral health and disease.

Source(s) of funding: US NIH, NZ HRC, Otago Medical Research Foundation.

Outcomes during 2009-2010: Work in this area continues to attract international attention and to be published in the top international journals: 3 papers were published, and 3 conference presentations were made. The age-38 assessments commenced in June 2010 and will continue until December 2011.

Activity 2. Other dental epidemiological research

Description: Dental epidemiological studies in NZ and overseas.

Aims: Various – enhancement of the knowledge base for dental epidemiology, dental public health, and clinical practice.

Source(s) of funding: Various – including NZ Ministry of Health, NZDA Research Foundation, the Health Research Council of NZ, Dental Council of NZ.

Outcomes during 2009-2010: 8 papers were published and 2 conference presentations were made.

Activity 3. Dental health services research

Description: Dental health services research in NZ, including ongoing, systematic dental workforce research.

Aims: Enhancement of the knowledge base for dental public health and clinical practice.

Source(s) of funding: Various – including NZDA Research Foundation, the Health Research Council of NZ, Dental Council of NZ.

Work in this area uses both quantitative and qualitative approaches, and continues to be diverse and productive.

Outcomes during 2009-2010: 12 papers were published and 8 conference presentations were made. Two clinical research papers were also published and are included here because they do not fit the other categories.

Activity 4. Development of new dental epidemiological, clinical and health services researchers and research capacity

Description: Training of new researchers for NZ and the Asia-Pacific region.

Aims: To build research capacity in our field.

Outcomes during 2009-2010: successful postgraduate completions comprised four Doctors of Philosophy (KMS Ayers, JM Broadbent, JG Doss, LA Foster Page), four Doctors of Clinical Dentistry (K Soma, S Ma, K Timmins, A Kelsen) and two Masters of Community Dentistry (DM Shearer, T Misa). Professor Thomson conducted a scientific writing workshop in Wellington on 20 August 2009.



Professor Murray Thomson (third from left) primary supervisor to dentistry doctoral graduands (from left to right) Jennifer Doss, Lyndie Foster Page and Jonathan Broadbent. This was the first time an Otago dentistry staff member was the main supervisor of three people receiving PhDs at the same ceremony (2010).

Education Research

Programme Leader: Professor Tom Kardos

OVERVIEW

The Education Research Theme is a relatively new grouping within the Faculty that promotes the recognition of teaching as a professional and scholarly activity through research into dental education, teaching and learning. Faculty-based educational research aligns with two of the University's strategic imperatives: achieving excellence in research informed teaching; and ensuring outstanding campus environments and student experience. Most teaching staff within the Faculty are engaged in educational research in the form of teaching and course evaluations. Ongoing evaluation can lead to improved teaching programmes and student outcomes. Several senior academic staff actively participate in international forums on dental education, where they share their knowledge and expertise. Some staff are also engaged in research that examines teaching and learning as a field of academic scholarship. Such research can inform our understandings of teaching and learning generally, improve the quality of undergraduate and postgraduate educational experiences within the Faculty, foster reflective teaching practice, improve educational outcomes, and facilitate research-informed curriculum development.

STAFF

Staff included in the education research theme are involved in in-house educational research, educational advisory work/engagement, and educational research that examines teaching/learning as a field of academic scholarship. Staff actively engaged in educational research groups include: Ms Susan Moffat, Mrs Rosemary Kardos, Professor Tom Kardos, Mrs Alison Meldrum, Dr Dawn Coates, Dr Vivienne Anderson, Professor Jules Kieser, Dr Lyndie Foster Page, Dr Andrew Tawse-Smith, Associate Professor Alison Rich, Mr Neil Waddell, Professor Gregory Seymour, Professor Robert Love and Mrs Lara Friedlander. Students include Jayaram Subramanian (DClinDent), Michelle Kang (BDS), and Lilian Pang (BDS).



Third-year BDS students after their arrival from International Medical University, Malaysia. Staff members present: Dr Lyndie Foster Page and Dr Andrew Tawse-Smith.

RESEARCH PROJECTS

Educational research conducted or completed during the 2009-2010 period has focussed on the following broad areas:

- Oral Health workforce issues in New Zealand and the United States of America;
- teaching in Oral Health degree programmes in NZ and the USA;
- student, graduate and employer perceptions of the Bachelor of Oral Health programme;
- student, graduate and employer perceptions of the Bachelor of Dental Technology programme;
- Dental technicians' continuing education needs;
- teaching and learning in endodontics;
- teaching and learning in cariology;
- Bachelor of Oral Health and Bachelor of Dental Surgery students' perceptions of their educational environment and future professional work;
- fostering smooth transitions for students in Malaysia-New Zealand partnered dental education;
- Bachelor of Dental Surgery students' health-promoting attributes; and
- Doctor of Clinical Dentistry students' perceptions of their postgraduate programmes.

EXTERNAL COLLABORATIONS

External collaborations have been established with Oral Health colleagues in New Zealand and in Australia. Other educational research collaborations have been established with Pamela Tolson, American Association of Public Health Dentistry; Dr Caswell Evans, University of Illinois; Associate Professor Margherita Fontana, University of Michigan; and Dr Karla Gambetta-Tessini, University of Melbourne.



Professor Tom and Rosemary Kardos with Ms Pam Tolson and Dr Caswell Evans about to board a local "taxi" in Alaska for an on-site visit to Kwethluk, with the pilot and regional manager in the background.

Oral Molecular and Immunopathology

Programme Leaders: Professor Greg Seymour and Associate Professor Alison Rich

OVERVIEW

The main objective of our group is to explore the cellular and molecular basis of oral diseases, so as to improve their diagnosis and treatment. The group has three major themes: (i) periodontal diseases; (ii) oral mucosal disease including oral squamous cell carcinoma; and (iii) tissue regeneration. In this context, a range of molecular, immunological and pathological tools are employed, including genomic and focused micro-arrays, real time PCR, and immunohistochemistry. In terms of periodontal disease, the focus is on using the peripheral blood and salivary transcriptomes in the determination of susceptibility, the use of metagenomics to further our understanding of the oral microbiota in health and disease, and epigenetics to determine the influence of environmental factors such as smoking. The relationship with systemic diseases is being investigated as part of a multidisciplinary international collaborative study, while the immunopathological mechanisms underpinning oral mucosal disease and periapical pathology are being investigated using single and double layer immunofluorescence and immunohistochemistry augmented by PCR and microarray technology. Endoplasmic stress in inflamed oral tissues is being explored and the role of periapical stem cells and angiogenesis in root development and the effect of bisphosphonates on gene expression in oral cells are also being investigated. In collaboration with the oral implantology research group, healing associated with dental implants is being studied in terms of gene expression and immunohistology. An evaluation is being made of the relationship between intestinal and oral manifestations of Crohn's Disease.

STAFF AND STUDENTS

| | |
|-------------------|----------------|
| Praveen Parachuru | Doris Lam |
| Dawn Coates | Kimmy Lin |
| Eric Chen | Robert Love |
| Patty Chou | Trudy Milne |
| Mary Cullinan | Anita Nolan |
| Norman Firth | Erni Noor |
| Lara Friedlander | Edward Ohlrich |
| Osea Gavidì | Alison Rich |
| Nick Heng | Benedict Seo |
| Haizal Hussaini | Greg Seymour |
| Faizal Hidayat | Sobia Zafar |
| Lynda Horne | |

The Crohn's disease study is being undertaken in conjunction with colleagues in the Department of Biochemistry University of Otago, and Dunedin, Christchurch and Auckland Hospitals.

We have international collaborative studies with the Oral Cancer Research and Coordinating Centre, University of Malaya (www.malaysiaoralcancer.org) Malaysia, the School of Medicine of the University of Queensland, Australia, the School of Dentistry, Niigata University, Japan, the University of Hong Kong, and a developing collaboration with the University of Sheffield.

In association with the School of Medicine at the University of Queensland, the group is conducting a major 5-year longitudinal clinical study on the relationship between periodontal and cardiovascular diseases. This study has attracted over \$3 million in funding over the past 5 years and, as a result, the group is considered a world leader in this field. The group is also recognised as a world leader in using molecular and cellular techniques in clinical trials.

SPECIFIC RESEARCH PROJECTS

Characterisation of natural regulatory T cells and Th17 cells in human periodontal disease;

Expression of pro-inflammatory cytokines and distribution of immune cells in oral squamous cell carcinoma;

Expression of toll-like receptor 2 in oral mucosal lichen planus using immunohistochemistry and quantitative real-time reverse transcriptase polymerase chain reaction;

Endoplasmic stress in periodontal diseases;

TLR2 & 4 in periapical lesions and Immunohistochemical localization of TLR2, TLR4, and the RANK/RANKL/OPG system in pulp and periradicular disease associated inflammatory root resorption;

Gene expression profiles of GroEL and heat shock protein 60 specific T cells in atherosclerosis and chronic periodontitis;

The salivary and peripheral blood transcriptomes and susceptibility to progressive periodontal disease;

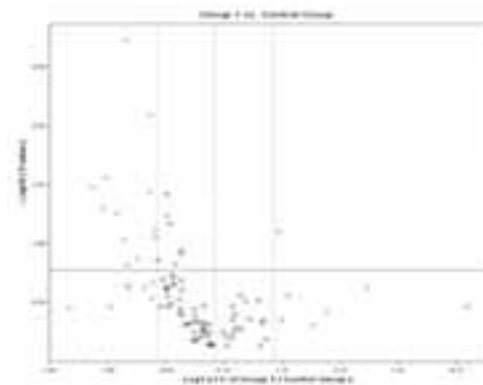
The relationship between intestinal and oral Crohn's disease;

The role of bisphosphates on gingival fibroblast gene expression; and

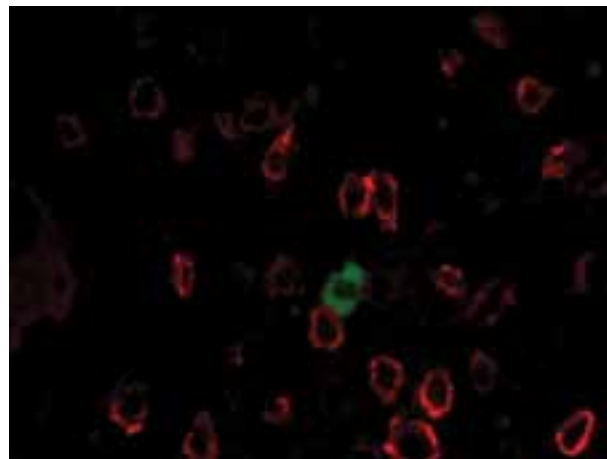
Periapical stem cells and angiogenesis in the periapical region.



The process of extracting RNA from paraffin-embedded oral cancer tissues by one of our PhD candidates, Haizal Hussaini.



Graph showing T cell energy and tolerance genes that are up and down regulated in oral cancer, Source: Haizal Hussaini.



Photomicrograph of inflamed connective tissue in a specimen of periodontitis which has been frozen immediately after surgical removal and processed for double immunofluorescence. Numerous cells show surface positivity for CD8, a marker of T lymphocytes (red). A single cell, which is negative for CD8, is positive for interleukin (IL)-17 (green). This indicates that IL-17+ve cells are not CD8⁺ T cells. Original magnification x60. This work forms part of the PhD project of Praveen Parachuru. Praveen is investigating the role of regulatory T cells and Th17 cells in periodontal diseases in the Molecular Immunopathology Research Group.

Molecular Microbiology

Programme Leader: Professor Richard Cannon

Oral microbes cause disease in a large proportion of the population. The research carried out under this programme aims to study the microorganisms responsible for a range of oral diseases, to understand how the diseases are caused, and to devise strategies to prevent them. The researchers use biochemical, molecular biological and microbiological techniques within a Physical Containment level 2 (PC2) laboratory to investigate and ameliorate oral and other microbial diseases.

In 2009-2010, the Molecular Microbiology programme was awarded over \$2 million in research funding from the following sources: the National Institutes of Health (USA), the Marsden Fund of the Royal Society of New Zealand, the Health Research Council of New Zealand, the Foundation for Research Science and Technology, the New Zealand Dental Association Research Foundation, the Otago Medical Research Foundation and the University of Otago Research Committee.

MOLECULAR MICROBIOLOGY STAFF:

| | |
|--------------------------|----------------------|
| Professor Richard Cannon | Dr Kyoko Niimi |
| Mr Kenneth Chong | Dr Masakazu Niimi |
| Dr Nick Heng | Dr Geoff Tompkins |
| Dr Ann Holmes | Mrs Jenine Uprichard |
| Dr Mikhail Keniya | Dr Matthew Woods |
| Dr Erwin Lamping | Ms Dee Yang |
| Professor Robert Love | Mr Gene Zhu |
| Dr Brian Monk | |

MOLECULAR MICROBIOLOGY POSTGRADUATE STUDENTS:

| | |
|---------------------|------------------|
| Marina Mohd Bakri | Karen Matejka |
| Frank Fischer | Albert Nguyen |
| Sujan Gowda | Bikiran Pardesi |
| Leanne Hou | Rohan Rodricks |
| Franziska Huschmann | Ely Rodrigues |
| Darnell Kennedy | Madhu Shankar |
| Karl Lyons | Langley Tasmania |

VISITING SCIENTISTS AND STUDENTS

Associate Professor Hiroji Chibana, Chiba University, Chiba, Japan

Dr Antonio Ferreira-Pereira, Universidade Federal do Rio de Janeiro, Brazil

Mr Morgan Han, Auckland University

Mr Ken-Ichi Iwabuchi, Tokyo Institute of Technology, Tokyo, Japan

Associate Professor Susumu Kajiwara, Tokyo Institute of Technology, Tokyo, Japan

Professor Pete Magee, University of Minnesota, St Paul, USA

Dr Nikhat Manzoor, Jamia Millia Islamia, New Delhi, India

Ms Juli Place, University of South Florida, Tampa, USA

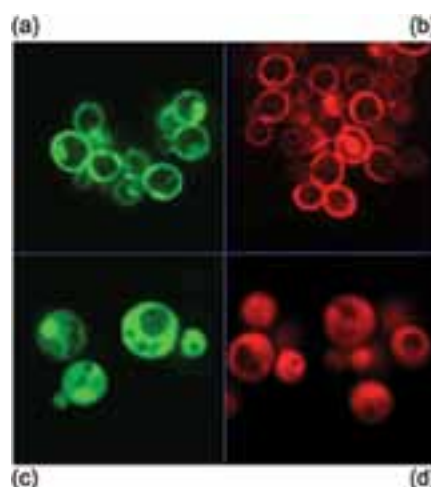
Professor Larry Sklar, University of New Mexico, Albuquerque, USA

Professor Robert Stroud, UCSF, San Francisco, USA

RESEARCH PROJECTS

There are several projects within the molecular microbiology programme.

- One project is investigating how periodontal bacteria acquire the haem they require for growth, as preventing this access may help prevent periodontal disease.



Expression in *Saccharomyces cerevisiae* of the *Candida albicans* plasma membrane efflux pump Cdr1p responsible for fluconazole resistance: (a) Cdr1p-GFP; (b) Cdr1p-mRFP. Expression of control cytoplasmic protein Ura3p: (c) Ura3p-GFP; (d) Ura3p-mRFP.

- A group is investigating how bacteria colonize and invade dentinal tubules, which can lead to endodontic infections. Other researchers are developing an *ex vivo* model for assessing the efficacy of endodontic disinfection regimens.
- People possess unique oral microbial microbiota that are relatively stable. One research project is investigating whether criminals could be identified from unique patterns of bacterial DNA left on victims following bite mark injuries.
- A research team is using next-generation DNA sequencing technology to analyse the 'metagenome' associated with oral health and periodontal disease.
- Next-generation DNA sequencing is also being used to sequence the genomes of two strains of the tongue-dwelling bacterium *Streptococcus salivarius*. The projects are currently in the final stages of genomic gap closure.
- Proteins bearing the pathogenesis-related domain (PRD) are involved in the immune response of plants, human reproduction, brain tumours and the production of marine toxins, but the molecular basis of their function is unknown. The Tex31 protein is being studied as a representative PRD protein to test the hypothesis that the PRD domain has a novel protease activity.
- A major research focus is on the oral fungi that cause mucosal and systemic infections. One research team has discovered major mechanisms of clinically relevant azole and echinocandin resistance in oral fungi and is currently screening for drugs to overcome azole resistance. The drug screening platform is also being applied to other, novel, antifungal drug targets and to drug targets implicated in other human diseases.
- Overexpression of ABC protein Cdr1p is a major contributor to azole antifungal drug resistance in clinical *C. albicans* isolates yet little is known about its substrate specificity and pump function. A comprehensive biochemical and structural analysis of Cdr1p has resulted in a model indicating regions of the pump that interact with key substrates and inhibitors.
- Human ABC transporters are responsible for the drug resistance of some tumour cells. To study their drug efflux properties, a research team has expressed them in the yeast *Saccharomyces cerevisiae*. The team is focusing on improving the expression of human ABC transporters in yeast strains so that they can be used for functional analysis and in high-throughput screening for drug discovery.
- Another research theme is microbial adhesion. One project is investigating the microorganisms that adhere to prostheses used as obturators for maxillary resections. Another project is looking at the role of salivary proteins in oral microbial adhesion. A further project is investigating whether antibodies raised against the human pathogen *Candida albicans* can be used to prevent *C. albicans* adhesion.
- *C. albicans* was thought until recently to be a diploid fungus that does not undergo sexual reproduction. A research group within the programme has discovered, however, that *C. albicans* strains can mate in an animal model of oral colonization. The group is testing whether the offspring can out-compete their parents.

EXTERNAL COLLABORATORS

Professor Shigeru Abe, Teikyo University, Tokyo, Japan

Dr David Bellows, Victoria University, Wellington

Dr Stewart Bisset, AgResearch, Palmerston North

Associate Professor Hiroji Chibana, Chiba University, Chiba, Japan

Dr Edmund Fleischer, MicroCombiChem, Weisbaden, Germany

Dr Anette Klinger, MicroCombiChem, Weisbaden, Germany

Professor Andre Goffeau, Universite catholique de Louvain, Brussels, Belgium

Dr Michael Gottesman, National Cancer Institute, NIH, Bethesda, USA

Associate Professor Susumu Kajiwara, Tokyo Institute of Technology, Tokyo, Japan

Professor Pete Magee, University of Minnesota, St Paul, USA

Associate Professor Hironobu Nakayama, Suzuka University of Medical Sciences, Mie, Japan.

Professor David Perlin, Public Health Research Institute, Newark, USA

Professor Isabel Sá Correia, Instituto Superior Técnico, Lisbon, Portugal

Drs. Christine Seers and Catherine Butler, University of Melbourne, Australia

Dr Jan Schmid, Massey University, Palmerston North

Professor Larry Sklar, University of New Mexico, Albuquerque, USA

Professor Robert Stroud, UCSF, San Francisco, USA

Dr Koichi Tanabe, National Institute of Infectious Diseases, Tokyo, Japan

Dr Silas Villas-Bôas University of Auckland, Auckland

Oral Microbiology and Dental Health Research Theme

Theme Coordinator: Dr G.R. Tompkins

THEME MISSION

The mission of the University of Otago Oral Microbiology and Dental Health Research Theme is to foster, support, and develop research into oral microbiology as it relates to dental health. The research theme will thus be a focus of scholarship and research in oral microbiology for the University of Otago, and for New Zealand.

THEME PERSONNEL

Co-ordinator: Dr Geoffrey Tompkins

Advisory board: Professor Richard Cannon, Professor John Tagg, Associate Professor Christopher Sissons

Personnel: 26 University staff (faculty and research fellows); 22 graduate students, 8 undergraduate students; 5 non-university members.

THEME ACTIVITIES

- *Research accomplishments:* Reporting Theme members published 24 peer-review papers, 7 book chapters, one other (non-peer-reviewed) article and 22 conference abstracts during 2010. Competitive research funding to theme members totalled \$1.29 million (including intramural funding). Note that some of the extramural funding included in this figure is longer term (i.e. over three years).
- *Workshops:* In conjunction with the Dental Caries group (Faculty of Dentistry), we invited, as our international speaker, Dr. Margherita Fontana from the University of Michigan. Dr. Fontana has research interests both in the aetiology of dental caries as well as the teaching of cariology and caries prevention and treatment.
- *Postgraduate and postdoctoral support* (eg Conference supplements): Seven international travel supplements to students and post-doctoral fellows were awarded in 2010.
- *Links & collaborations including communication with other groups:* Theme members collaborate with the following institutions and companies: Fonterra Innovation Centre, AgResearch, Trinity Bioactives, Lactopharma, University of Aarhus (Denmark), University of Manchester, INRA (Paris), Queensland Institute of Medical Research, University of Alabama (Tuscaloosa), Canterbury DHB, Capital Coast DHB, Wellington Institute of Technology, National

University of Singapore, University of Oklahoma, Auckland University of Technology, Academic Centre for Dentistry Amsterdam, Leeds Dental Institute, IST Lisbon, New Jersey Medical School, New Mexico Centre for Molecular Discovery (Albuquerque), University of Queensland, Environmental Science and Research (Porirua), University of Melbourne.

- *Media releases and public lectures:* Professor John Tagg was interviewed on TV3's programme "What's really in our ..." and appeared in TEDx Dunedin presentation (Dec 6, 2010). Darnell Kennedy (Ph.D. student under supervision of Dr. Geoffrey Tompkins and Dr. Jo-Ann Stanton) was interviewed about her research on Radio New Zealand's "Our changing world" programme, July 29, 2010. A brief account of Dr. Kyoko Niimi's project appeared in the Otago Daily Times (July 14, 2010) with announcements of successful FoRST bids from the University of Otago.
- *Summer Studentships:* The Theme provided one summer studentship in 2010-11. The scholarship was awarded to Lydia Ng (4th year BDS student). A further eight undergraduate students gained studentships supported by other programmes to work with Theme members over the summer.

THEME OUTCOMES

- Demonstrating national leadership and international recognition for excellence. Prizes: Grace Lee won the Unilever travel award for her poster presentation at the ANZ IADR meeting in Kiama NSW in September 2010. This enabled her to enter the Hatton competition at the IADR Conference in San Diego, March 2011.
- Attracting significant external funding:
Dr. Kyoko Niimi and Prof. Richard Cannon were awarded a Foundation for Research Science and Technology grant to broaden their research on resistance to antifungals to address the problem of anti-helminth resistance. The project is titled "Overcoming drench resistance" (\$923,392).
Dr. Brian Monk secured a Marsden Fund award titled "Multifunctional azoles: A triple whammy designed to defeat drug resistance" (\$840,000).
- Facilitating communication and collaboration: Seven theme members received grants-in-aid to attend overseas conferences and visit collaborators.

- Notable publications:
Lamping E, Baret PV, Holmes AR, Monk BC, Goffeau A, Cannon RD. Fungal PDR transporters: phylogeny, topology, motifs and function. *Fungal Genetics and Biology* 47: 127-142 (2010).
Filoche S, Wong L, Sissons CH. Oral biofilms: emerging concepts in microbial ecology. *Journal of Dental Research* 89: 8-18 (2010).
- Signalling an area of research strength: Professor John Tagg's research continues to translate into commercial application; BLIS Technologies, (whose scientists are all Theme members) were judged Frost and Sullivan Global Probiotics Entrepreneurial Company of the Year for 2010. BLIS Technologies have secured marketing opportunities in the USA.





VIVIENNE ANDERSON

BEd (Cant) PhD PGDipArts (Otago) DipTchg (Chch CE)
Dentistry
Dental Education Support Officer

Vivienne Anderson conducts educational research examining international education policy and practice, how students' experiences can inform teaching and learning, post-graduation pathways, student perceptions of educational environments, and student perceptions of future professional practice. Her doctorate was awarded in August 2009. Dr Anderson's research within the Faculty involves collaboration with staff across all three undergraduate programmes (Dentistry, Oral Health, and Dental Technology). In the 2009-2010 period, she received research funding in the form of a Building Research Capacity in the Social Sciences (BRCSS) grant and two Quality Advancement Unit Quality Improvement Grants (as an Associate Investigator and Principal Investigator). She is also involved in an ongoing contract research project funded by the Asia NZ Foundation, tracking Asia-born New Zealand-educated business graduates' study-to-work transitions. Vivienne co-supervises one DClinDent student and has supervised several undergraduate student research projects.

Research and Collaboration

Research projects begun during the 2009-2010 period include: an action research project tracking Malaysian students' transition between BDS study in Kuala Lumpur and Dunedin; a study examining BOH and BDentTech graduate post-graduation perceptions of their academic programmes, and employer and work placement provider perceptions of student/graduate attributes; and research examining BDS and BOH students' perceptions of their educational environment and future professional work at the start and end of their first and second professional year. The first project involves collaboration with Dr Andrew Tawse-Smith and Associate Professor Alison Rich; the second, with Mrs Alison Meldrum, Ms Susan Moffat and Mr John Aarts; and the third, with Dr Lyndie Foster Page. Other collaborations have been established with Associate Professor Margherita Fontana, University of Michigan (with Dr Lyndie Foster Page); Dr Tara Duncan, Tourism, and Dr Martha Bell, Sociology (joint funding for mobility-related research and co-convening a 2009 'mobiities' symposium); and Dr Karla Gambetta-Tessini at the University of Melbourne (research examining dental students' health-promoting attributes). Publications in preparation from the Asia NZ Foundation-funded

project involve collaboration with Dr Andrew Butcher (Director, Research and Policy, Asia NZ Foundation) and Mr Terry McGrath (former president, ISANA International Education Association).

Recent Publications

McGrath T, Anderson V, Ching CP, Doi A, and Stock P. Tracking Study Series of Asian Business Graduates: Report I. Wellington: Asia New Zealand Foundation (2009). Retrieved from: <http://www.asianz.org.nz/our-work/knowledge-research/research-reports/business-research>



VINCENT BENNANI

DDS (Reims) Docteur de l'Universite de Nice Sophia Antipolis
CertAdvPros (Tufts) CertAdvImpl (Bordeaux)
Oral Rehabilitation
Senior Lecturer

Dr Bennani's research interests have focused on modern developments in implant dentistry, particularly the use of a new biocompatible ceramic material (Zirconia) for implant manufacture and implant framework superstructure fabrication.

The second aspect of Dr Bennani's research includes the non-traumatic soft tissue management around natural teeth and implants in fixed prosthodontics.

Research and Collaboration

Dr Bennani is actively involved in several collaborative projects with other departments in the Faculty of Dentistry, the Department of Chemistry, the Department of Biochemistry and the Faculty of Medicine.

Recent publications

Abduo J, Bennani V, Waddell N, Lyons K, Swain M. Assessing the fit of implant fixed prostheses: A critical review. *International Journal of Oral and Maxillofacial Implants* 25: 1-10 (2010).

Bennani V, Shahmiri R. A simple method to transfer the selected path of insertion of a removable partial denture intraorally. *The Journal of Prosthetic Dentistry* 101: 73-74 (2009).



JONATHAN BROADBENT

BDS PhD (Otago)
Oral Sciences
Research Fellow

Dr Broadbent is involved in the collection, analysis, and reporting on data from the Dunedin Multidisciplinary Health and Development Study (a prospective observational study of a cohort of New Zealanders born in 1972-73).

His research efforts include projects involving the epidemiology of dental caries, tooth loss, and periodontal disease (with emphasis upon longitudinal research). Dr Broadbent's research has a focus on social and ethnic inequalities in oral health.

Dr Broadbent's PhD was conferred in 2010.

Research and Collaboration

Ongoing collaboration with researchers from Pelotas and Florianopolis in Brazil, investigating the role of family income in determining oral health outcomes in the Pelotas Birth Cohort, as well as research into longitudinal dental methodology, with comparisons between the Pelotas Study and the Dunedin Study.

Collaboration with dental researchers in Adelaide, Australia, at the Australian Research Centre for Population Oral Health (ARCPOH) during 2009 and 2010, specifically investigating dental service-use.

Recent Publications

Thomson WM, Williams SM, Broadbent JM, Poulton R, Locker D. Long-term dental visiting patterns and adult oral health. *Journal of Dental Research* 89: 307-311 (2010).

Thomson WM, Broadbent JM, Locker D, Poulton R. Trajectories of dental anxiety in a birth cohort *Community Dentistry and Oral Epidemiology* 37: 209-219 (2009).



JOHN BROUGHTON

ED JP BSc (Massey) BDS PhD PGDipComDent DipGrad
(Otago) (Māori Health)
(Joint with Preventive and Social Medicine)
Oral Diagnostic and Surgical Sciences
Associate Professor

Research activities have included Māori oral health, Injury Prevention (The NZ Drivers Study), New Zealand Māori Theatre and Māori taonga (treasured items) in the Otago Museum.

Associate Professor Broughton is the Principal Investigator for an International Collaborative Indigenous Health Research Partnership grant from the HRC: "Reducing disease burden and health inequalities arising from chronic dental disease among Indigenous children: an early childhood caries intervention" (\$2.4M).

The important approach in his Māori health research has been the utilisation of a kaupapa Māori methodology which he developed and successfully applied in his PhD thesis. This kaupapa Māori methodology is being utilised in Associate Professor Broughton's current research work, which he has presented at numerous hui and conferences.

His involvement with the New Zealand Drivers Study has been to be responsible for aspects of tikanga Māori (Māori customs) in the research methodologies.

With regard to New Zealand Māori theatre, Associate Professor Broughton was the subject of a symposium in Auckland in November 2010, facilitated by Playmarket, in which his play, "Michael James Manaia" was discussed and performed. This play will be republished in 2011 and a national tour has been scheduled for 2012.

Māori taonga in the Otago Museum: Associate Professor Broughton is a co-curator for a major exhibition which is to travel to the Shanghai Museum in China in 2011.

Research and Collaboration

Te Ao Māori: Māori Treasures from the Otago Museum, New Zealand: As a member of the Māori Advisory Committee of the Otago Museum, Associate Professor Broughton proposed that a new exhibition of *taonga* (treasured items) from the Museum collections be created. This was approved by the Board of the Museum. It was decided that this exhibition would travel to China and be exhibited in the main gallery of the Shanghai Museum. As a co-curator of the exhibition, Associate Professor Broughton has collaborated with the Otago

Museum curators and the directors of the Shanghai Museum to select the 350 items and has undertaken considerable research for the associated exhibition publication. The exhibition will open in July 2011 in Shanghai.

An international collaboration with Indigenous oral health research teams in Australia and Canada: Reducing disease burden and health inequalities arising from chronic dental disease among Indigenous children: an early childhood caries intervention. The New Zealand partnership of the project is being conducted in collaboration with Raukura Hauora O Tainui and the Waikato-Tainui College for Research and Development.

Recent Publications

Parker EJ, Jamieson LM, Broughton J, Albino J, Lawrence HP, Roberts-Thomson K. The oral health of Indigenous children: A review of four nations. *Journal of Paediatrics and Child Health* 46: 483-486 (2010).

Jamieson L, Broughton J, Lawrence H. Reducing dental disease burden and oral health inequalities among Indigenous populations. Editorial, *International Dental Journal* 60: 211 (2010).

Broughton JR. An oral health intervention for the Māori Indigenous population of New Zealand: Oranga niho Māori (Māori oral health) as a component of the undergraduate dental curriculum in New Zealand. *International Dental Journal* 60: 223-228 (2010).

Fairhall TJ, Thomson WM, Kieser JA, Broughton JR, Cullinan MP, Seymour GJ. Home or away? Differences between home- and clinic-based dental examinations for older people. *Gerodontology* 26: 179-186 (2009).



RICHARD CANNON

BA PhD (Camb)

Oral Sciences

Professor and Head of Department

Professor Cannon is a molecular microbiologist interested in how microorganisms cause oral diseases and in how treatments for patients with these diseases can be improved. His research has a number of themes, one being oral adhesion. He is interested in how oral microbes, particularly yeast, adhere and colonize the oral cavity. He has found that saliva increases the adhesion of the yeast *Candida albicans* to several oral surfaces and is investigating whether milk enriched in IgA antibodies can prevent this adhesion and hence preclude oral candidosis. *C. albicans* is a diploid yeast that was, until recently, thought to be asexual. The yeast can, however, undergo sexual recombination *in vitro*, and Professor Cannon is currently investigating whether *C. albicans* strains can mate in the oral cavity and, if so, whether the offspring can out-compete their parents. A major focus of his research is the drug resistance of human fungal pathogens. He has found that clinically significant fungal drug resistance is due to energy-dependent drug efflux from the cell. His research group has developed a unique system for expressing and studying these efflux pumps in baker's yeast *Saccharomyces cerevisiae*. They are currently using *S. cerevisiae* strains expressing fungal efflux pumps to study pump function and to search for pump inhibitors. Professor Cannon also has research interests in the potential role of *C. albicans* in promoting oral squamous cell carcinoma, the pathogenicity factors of ***C. albicans***, and in antifungal drug discovery.

Research and Collaboration

With funding from the NIH (USA), Professor Cannon's research group has continued to study the *C. albicans* efflux pump Cdr1p which is responsible for the azole-resistance of clinical isolates. They have used their novel membrane protein expression system to identify a D-octapeptide that specifically inhibits Cdr1p. In collaboration with Professor Shigeru Abe of Teikyo University (Tokyo), they have shown that this peptide makes an azole-resistant clinical *C. albicans* isolate susceptible to fluconazole in an animal model of oral candidosis. Professor Cannon is currently collaborating with Professor Larry Sklar at the University of New Mexico (USA) to undertake a high-throughput screen of the 300,000-member NIH compound library for further fungal pump inhibitors.

There is potential to use the novel protein expression system to study human membrane proteins involved in many common diseases. In a project funded by the Foundation for Research Science and Technology, and in collaboration with A. Prof Susumu Kajiwara of Tokyo Institute of Technology, Professor Cannon is optimizing the system for the expression of human membrane proteins. In another project with Prof Sklar, funded by the Health Research Council of New Zealand, Professor Cannon is investigating whether the pumps responsible for the drug resistance of melanoma tumour cells can be studied using the membrane protein expression system. In a Marsden-funded project in collaboration with Dr Jan Schmid of Massey University, Professor Cannon's group has shown that *C. albicans* can undergo sexual recombination in an animal model of oral colonization, but that the offspring are less fit than the parents. Other work with Dr Schmid has investigated the mutability of repeat-containing potential virulence genes, such as *PNG2*, in *Candida albicans*.

Recent Publications

Cannon RD, Lamping E, Holmes AR, Niimi K, Baret PV, Keniya MV, Tanabe K, Niimi M, Goffeau A, Monk BC. Efflux-mediated fungal drug resistance. *Clinical Microbiology Reviews* 22: 291-321 (2009).

Lamping E, Ranchod A, Nakamura K, Tyndall JDA, Niimi K, Holmes AR, Niimi M, Cannon RD. Abc1p is a multidrug efflux transporter that tips the balance in favor of innate azole resistance in *Candida krusei*. *Antimicrobial Agents and Chemotherapy* 53: 354-369 (2009).

Lamping E, Baret PV, Holmes AR, Monk BC, Goffeau A, Cannon RD. Fungal PDR transporters: phylogeny, topology, motifs and function. *Fungal Genetics and Biology* 47: 127-142 (2010).

Zhang N, Cannon RD, Holland BR, Patchett ML, Schmid J. Impact of genetic background on allele selection in a highly mutable *Candida albicans* gene, *PNG2*. *PLoS One* 5:e9614 (2010).



NICHOLAS CHANDLER

BDS PhD (Lond) MSc (Manc) LDSRCS FDSRCPSGlas
FDSRCSEd FFDRCSI
Oral Rehabilitation
Associate Professor

Associate Professor Chandler has been interested in the diagnosis of dental pulp disease since commencing MSc studies on Doppler ultrasound in 1983. His 2005 PhD studies involved laser Doppler diagnosis. A study of electric pulp tests was the subject of a DCLinDent thesis in 2007, and doctoral level studies on this topic continue. Endodontic surgery has been a theme since 2002. Three DCLinDent students have investigated infection at or near the root apex, and a current student is studying the quality of root-end caries and fillings.

Research and Collaboration

Doctoral supervision as above, and University of Manchester, UK; Dr Alison Qualtrough has been a postgraduate Visiting Fellow at the Faculty of Dentistry twice. Four refereed papers and 4 abstracts have appeared, with an ongoing two-centre radiographic assessment project underway.

University of Marama, Istanbul, Turkey: Professor Nevin Kartal. A root apex detection study has been completed and a manuscript submitted.

Recent Publications

Purton DG, Chandler NP, Monteith BD, Qualtrough AJE. A novel instrument to determine pulp proximity. *European Journal of Prosthodontics and Restorative Dentistry* 17: 30-34 (2009).

Desai SV, Chandler NP. Calcium hydroxide-based root canal sealers- a review. *Journal of Endodontics* 35: 475-480 (2009).

Violich DR, Chandler NP. The smear layer in endodontics- a review. *International Endodontic Journal* 43: 2-15 (2010).

Chandler NP, Pitt Ford TR, Monteith BD. Effect of restorations on pulpal blood flow in molars measured by laser Doppler flowmetry. *International Endodontic Journal* 43: 41-46 (2010).



DAWN COATES (CLARK)

BSc PhD (Otago)
Oral Sciences
Research Fellow

Dr Coates undertakes research into the cellular and molecular mechanism involved in tissue growth and remodeling in relation to dental health and disease. She has particular expertise in relation to the expression and regulation of angiogenic and anti-angiogenic proteins. Active research projects also include the study of multipotent cells associated with tooth development, as well as examining the factors involved in bone remodeling using both *in vitro* and molecular techniques. Dr Coates works directly with Professor Gregory Seymour in all of her research projects.

Research and Collaboration

Current projects involve qRT-PCR to study the regulation of angiogenic genes in response to bisphosphonates and how this relates to the prenylation of proteins and osteonecrosis of the jaw. Several projects investigate molecular signaling during bone remodeling in a sheep model and examine gene and protein changes. Dr Coates is also involved in research examining the multipotent cells within dental tissues. Measuring the levels of secretory IgA in response to environmental factors and in children with Down's Syndrome has also been a focus. Along with this, Dr Coates has been involved in the study of endoplasmic-reticulum-associated chaperone proteins associated with ER-stress and regulatory T cells and Th17 cells in periodontal disease.

Recent Publications

Moffat SM, Coates DE, Meldrum AM. New Zealand's changing oral health workforce. A dental practitioner's guide to dual-trained dental therapists/dental hygienists. *New Zealand Dental Journal* 6: 57-60 (2009).

Coates DE, Kardos TB, Moffat SM, Kardos RL. Dental therapists and dental hygienists educated for the New Zealand environment. *Journal of Dental Education* 73: 1001-1008 (2009).



MARY CULLINAN

BDS (Syd) MSc (Lond) FADI FICD
Oral Sciences
Research Associate Professor

In 2009/2010, Associate Professor Cullinan has had published (or accepted for publication) a total of 21 research outputs, including 19 peer reviewed articles, one book chapter and one edited book. Her research platform has primarily been on the relative contribution of various microbiological, genetic and environmental (particularly smoking) risk factors to susceptibility to periodontal disease. More recently, this has involved utilising a metagenomic approach to unravel the complexities of the oral biofilm in health and disease, as well as gene expression studies looking at gingival fibroblasts and the salivary and peripheral blood transcriptomes. Associate Professor Cullinan has conducted several major longitudinal studies looking at clinical and molecular risk for periodontal disease and the impact of oral disease on systemic health, along with evaluation of a psychologically based health promotion programme. Her international reputation has led to invitations to co-edit a volume of the high-ranking dental journal *Periodontology 2000* on the 'Comparative biology of chronic and aggressive periodontitis' and to contribute to reviews in *Clinical Microbiology and Infection*, the *British Dental Journal* and the *Australian Dental Journal*. As a result of her research, she was invited to be a keynote lecturer by the Philippines Society for Periodontology in 2009, The Royal Australasian College of Dental Surgeons and the Australian Society for Periodontology in 2010.

Research and Collaboration

Associate Professor Cullinan's research on understanding risk for oral disease involves utilizing a metagenomic approach and gene array technology to identify patient susceptibility to periodontal disease. Several major multidisciplinary longitudinal clinical studies are investigating the impact of various biological and psychosocial factors on oral health, the long-term effects of triclosan on thyroid function and on the progression of chronic periodontitis and the incidence of secondary cardiovascular events in patients with coronary heart disease. As part of her ongoing collaboration with Professors NP Lang (University of Hong Kong) and MJ Faddy (Queensland University of Technology), Associate Professor Cullinan is undertaking ante-dependence modelling of the famous Sri Lankan data set on the natural history of periodontal disease. In addition, she is involved in studies looking at the effect of bisphosphonates on gene expression in gingival fibroblasts, the effect of delayed, early and immediate placement

of implants in molar extraction sockets, the prevalence of periodontitis and oral characteristics in ankylosing spondylitis patients, and the impact of periodontal disease on oral-health-related quality of life among Omani teachers.

Recent Publications

Schätzle M, Faddy MJ, Cullinan MP, Seymour GJ, Lang NP, Bürgin W, Ånerud Å, Boysen H, Løe H. The clinical course of chronic periodontitis V. Predictive factors in periodontal disease. *Journal of Clinical Periodontology* 36: 365-371 (2009).

Armitage GC, Cullinan MP. Comparison of the clinical features of chronic and aggressive periodontitis. *Periodontology 2000* 53: 12-27 (2010).

Bohnstedt S, Cullinan MP, Ford PJ, Palmer JE, Leishman SJ, Westerman B, Marshall RI, West MJ, Seymour GJ. High Antibody Levels to *Pgingivalis* in Cardiovascular Disease. *Journal of Dental Research* 89: 938-942 (2010).

Oral Biology. Molecular techniques and applications. Eds GJ Seymour, MP Cullinan, NCK Heng. Springer New York (2010).



HARSHA DE SILVA

BDS (S Lanka) MS (Colombo) FDSRCS FFDRCSI
Oral Diagnostic and Surgical Sciences
Senior Lecturer

Study of clinicopathological markers to assess and predict the behavior of oral mucosal disorders with special emphasis on Sjogrens syndrome and *Candida* associated potentially malignant oral disorders.

Research and Collaboration

Harsha De Silva completed the preliminary work related to a proposed research collaboration between a Teaching Hospital in Sri Lanka and the Faculty of Dentistry (University of Otago) to commence a study to assess the role of *Candida albicans* in the clinicopathological behavior of potentially malignant oral disorders. He plans to apply for a research grant in 2011 to launch this project.

He has also been collaborating in research studies assessing the cell growth and survival characteristics; in particular, the 53 gene isoforms in autoimmune disease and in lymphoma patients.

Recent Publications

Naidoo RJ, De Silva HL, Tong DC. Full frontal: considerations in a 16-year-old rugby player with a frontal sinus fracture. *New Zealand Dental Journal* 105: 51-55 (2009).

Dias DK, De Silva HL, Shanmuganadan S. Nasopharyngeal carcinoma: presenting with symptoms mimicking dental disease. *Sri Lanka Dental Journal* 40: 35-39 (2010).



ROHANA KUMARA DE SILVA

BDS (S Lanka) FDSRCPSGlas FFDRCSI FDSRCS
Oral Diagnostic and Surgical Sciences
Associate Professor

The use of dental implants for replacing missing teeth is Associate Professor Kumara De Silva's main field of research, and the aim of his study group is to investigate the use of dental implants as a cost-effective way of replacing missing teeth to improve the quality of life of edentulous patients. These treatment methods were applied to investigate the quality of life of patients who use full or partial dentures.

He also conducts research in the management of post-operative pain after surgical removal of wisdom teeth and evaluates the metabolism of commonly used pain killers in the body. Several double-blinded crossover trials have been conducted to compare the different analgesics commonly used in the management of post-operative pain after the surgical removal of wisdom teeth. In addition, Associate Professor Kumara De Silva has designed a new flap technique for removal of wisdom teeth to minimise post-operative complications.

Research and Collaboration

Associate Professor Kumara De Silva's scope of research conducted in 2009 and 2010 is related to the use of dental implants to replace missing teeth, and pain control after surgical removal of wisdom teeth.

The following research projects are conducted under the above themes:

- Immediate loading of implants placed into healed and immediate extracted sockets in the mandible;
- Use of titanium and ceramic implant in novel positions in maxilla and traditional positions in mandible to support full upper and lower dentures. As a part of this research an anatomical study is also underway to investigate the completion of the mid-palatine suture;
- A double blind crossover clinical trial was conducted to assess the effectiveness of special/novel flap design for surgical removal of mandibular wisdom teeth; and
- Collaborative research project with the Department of Anatomy (School of Medicine) to investigate the thickness of parietal bone using human cadavers of the New Zealand population, to map the safest area for bone harvesting during facial reconstructions.



Recent Publications

Campbell DI, Kuzmanovic D, De Silva RK. Bimaxillary Osteotomy in a young patient with LADD Syndrome. *Journal of Oral and Maxillofacial Surgery* 68: 1685-1690 (2010).

Alsabeeha NHM, De Silva RK, Thomson WM, Payne AGT. Primary stability measurements of single implants in the midline of the edentulous mandible for overdentures. *Clinical Oral Implant Research* 21: 563-565 (2010).

Atieh MA, Duncan WJ, De Silva RK, Cullinan MP. Immediate Placement or Immediate Restoration/Loading of Single Implants for Molar Tooth Replacement: A Systematic Review and Meta-analysis. *The International Journal of Oral & Maxillofacial Implants* 25: 401-415 (2010).

Alsabeeha N, Payne AG, De Silva RK, Swain MV. Mandibular single-implant overdentures: a review with surgical and prosthodontic perspectives of a novel approach. *Clinical Oral Implants Research* 20: 356-65 (2009).

BERNADETTE DRUMMOND

BDS (Otago) MS (Roch) PhD (Leeds) FRACDS
Oral Sciences
Associate Professor

Associate Professor Drummond's research has concentrated on child oral health and treatment of dental diseases in childhood, particularly with respect to improvement in child oral-health-related quality of life. This research is investigating the unique causes and factors related to oral diseases in children, including the impact of fluoride on dental caries, the relationships of obesity and dental caries, and the causes of molar incisor hypomineralisation (MIH). There is also investigation of the long-term outcomes of dental treatment in terms of the survival of materials used and technique success. Data specifically recorded at every treatment carried out under general anaesthesia for over 20 years in the paediatric dental programme have formed the basis for Associate Professor Drummond's research and that of graduate students. This outcome research is unique for New Zealand.

Related projects have involved running a commercial clinical trial of establishing healthy bacteria in children's mouths. This is now going to be published.

A PhD project investigating the structure of dental enamel in a condition called Molar Incisor hypomineralisation is completed. The structure has not previously been described completely and the work with Associate Professor Drummond's graduate student has had a significant impact on determining how this condition might be treated in the future. Two DClinDent projects are also following this theme.

Research and Collaboration

Investigation of the long-term (after 6 years) oral health and related general health of children treated under general anaesthesia is being studied. Another project is investigating the impact of fluoridation on the severity of dental caries in the children – an approach that has not been used previously. Associate Professor Drummond is involved in two projects investigating how children acquire oral bacteria over time, using metagenomics technology.

With graduate students, she is supervising projects investigating the effect of exposure to environmental tobacco smoke on young children's oral health, the acquisition of harmful oral bacteria by children with Down Syndrome, and the prevention and repair of demineralisation lesions on teeth during orthodontic treatment. A PhD student is investigating the impact of bisphosphonate drugs on wound healing in the mouth.



Recent Publications

Farah R, Drummond B, Swain M, Williams S. Linking the clinical presentation of molar-incisor hypomineralisation to its mineral density. *International Journal of Paediatric Dentistry* 20: 353-360 (2010).

Farah RA, Monk BC, Swain MV, Drummond BK. Protein content of molar-incisor hypomineralisation enamel. *Journal of Dentistry* 38: 591-596 (2010).

Farah RA, Swain MV, Drummond BK, Cook R, Atieh M. Mineral density of hypomineralised enamel. *Journal of Dentistry* 38: 50-8 (2010).

WARWICK DUNCAN

ED MDS PhD (Otago) FRACDS

Oral Sciences

Senior Lecturer and Associate Dean (Facilities and Clinical Services)

Dr Duncan's research is mainly focused on the development of novel techniques for improving dental implant treatment, including laboratory and *in vitro* studies, preclinical trials in large animal models and clinical trials in human participants. He also contributes to basic science investigations of periodontal disease processes and wound healing, and provides expertise in hard tissue histology of teeth and bone for collaborators from the disciplines of forensic pathology, comparative anatomy and anthropology.

Research and Collaboration

Dr Duncan's personal research has involved the development of novel implant surfaces that were tested in various anatomical sites in a large animal model. Results have been presented at international conferences in 2009 and 2010. This project was in collaboration with Professors Min-Ho Lee and Tae Sung Bae from the Institute of Oral Bioscience BrainKorea21 Project at Chonbuk National University in Korea. He has also conducted research into the effectiveness of commercially available bone grafting replacements combined with different implant surface treatments in a large animal sinus lift model, in collaboration with Professor Christophe Hämmerle and Associate Professor Patrick Schmidlin from Zurich University in Switzerland. Other key collaborations include Professor Jules Kieser and Professor Mike Swain (Sir John Walsh Research institute) and Professor Mark Stringer and Dr Siân Halcrow (Anatomy and Structural Biology).

Postgraduate student projects that he has supervised include analysis of the effect of smoking and of bisphosphonates upon fibroblasts in an *in vitro* wound model, as well as micro-computerised tomographic analysis of peri-implant bone, RANKL, RANK and OPG expression in periodontal defects, Wnt expression during early osseointegration of titanium dental implants, comparison of Bio Oss® and Moa Bone® xenografts for sinus lift grafts and osseointegration of dental implants coated with hydroxyapatite-reconstituted keratin, all conducted using *in vivo* sheep models.



Recent Publications

Atieh MA, Payne AGT, Duncan WJ, de Silva R, Cullinan M. Immediate placement or immediate restoration/loading of single implants for molar tooth replacement: a systematic review and meta-analysis. *International Journal of Oral and Maxillofacial Implants* 25: 401-415 (2010).

Park C, Swain M, Duncan. Micro-computerised tomography optimisation for the measurement of bone mineral density around titanium dental implants. *Journal of Biomechanical Science and Engineering* 5(1- Special Issue): 2-10 (2010).

Kieser JA, Tkatchenko T, Dean MC, Jones ME, Duncan W, Nelson NJ. Microstructure of dental hard tissues and bone in the Tuatara dentary, *Sphenodon punctatus* (Diapsida: Lepidosauria: Rhynchocephalia). Koppe T, Meyer G, Alt KW (eds): *Comparative Dental Morphology. Frontiers of Oral Biology*. Basel, Karger; 13: 80–85 (2009).

JOHN EGAN

MHealSc PGDipCDTech (Otago)

Oral Rehabilitation

Lecturer

Mr Egan is currently involved in the following areas of research:

Case Report.

Squamous cell carcinoma removal in the mucosa of the lower lip can cause limited mouth opening, medically termed microstomia. For edentulous patients who have this condition, prosthetic treatment is challenging. Normal denture techniques may not be satisfactory, especially where there is a reduction in the normal maximal vertical opening of the mouth. Sectional and modified impressions and those with a small degree of flexibility for complete dentures have been reported.

Global Education for dental auxiliaries: Denturism

Denturism can be defined as the fabrication and delivery of removable complete and partial dentures by non-dentists directly to the public. Known internationally as 'denturists', they are also known as clinical dental technicians (in the UK and New Zealand) and dental prosthetists (Australia). There is a growing appreciation of the need to examine more carefully the training and education programs of professionals complementary to dentistry. This overview looks at the education programmes available for denturism.

Mini Dental Implant Overview

There is a lack of evidence using randomized trials for the application of mini-implants (sub-3mm) in humans. Mini-implants are being used as a more cost-effective method to anchor dentures. Do the publications back this up?

What Motivates patients to seek complete denture treatment?

Understanding what expectations the patient has is important, but we also need to consider what motivates the patient to seek treatment. Insight into the motivating factors can assist clinicians to approach the patient in the most appropriate manner and guide them to deliver what is desired or give them insight into potential issues. This study looks to gauge what motivates edentulous patients to replace their existing complete dentures. The reasons patients seek treatment at the Faculty of Dentistry (University of Otago) and the expectations they have in relation to their new dentures were also investigated.



Research and Collaboration

Collaboration with Steve Swindells (Combined Laboratory Manager, Otago); Graham Key (Head Teacher Charles Institute of Technology (Australia) and Education Chair International Federation of Denturists; Jamshid Zehtab, Head Teacher, George Brown Institute, Canada; Gerry Hansen (Executive director for IFD) Canada. Collaboration with Dr. Alan Payne and Dr. Warwick Duncan (Otago) on mini-implants and collaboration with John Aarts (Otago) and Kirsten Wade (Otago) on what motivates patients to seek complete dental treatment.

MAURO FARELLA

*DDS (Naples) Dottore di Ricerca (Reggio Calabria)
SpecOrthodontics (Naples) SpecMedStat (Milan)
Oral Sciences
Professor*

Professor Farella's research activities are mainly focused on the physiology and pathology of the masticatory muscles and on their relationship to orthodontics, craniofacial growth, and temporomandibular disorders. He is currently also involved in a number of randomized control clinical trials in orthodontics and in clinical gnathology.

Research and Collaboration

Professor Farella's research has been a mixture of activities carried out previously at the University of Zurich and new activities initiated at the Discipline of Orthodontics, University of Otago.

In Switzerland, he was the principal investigator in a research project testing the hypothesis that stereotypic patterns of muscle contractions are at risk for the development of masticatory muscle pain. In Otago, he has continued his research in craniofacial musculature, but with a greater focus on orthodontic-related issues. Professor Farella has started new collaborations with the School of Physiotherapy, with the Department of Psychology, and the Department of Radiology and has an ongoing collaboration overseas with the University of Zurich and the University of Naples Federico II.

Recent Publications

Farella M, Soneda K, Vilmann A, Thomsen CE, Bakke M. Jaw muscle soreness after tooth-clenching depends on force level. *Journal of Dental Research* 89: 717-721 (2010).

Farella M, Palumbo A, Milani S, Avecone S, Gallo LM, Michelotti A. Synergist coactivation and substitution pattern of the human masseter and temporalis muscles during sustained static contractions. *Clinical Neurophysiology* 120: 190-197 (2009).

Farella M, Palla S, Gallo LM. Time-frequency analysis of rhythmic masticatory muscle activity. *Muscle & Nerve* 39: 828-836 (2009).

Petracci E, Farella M, Galeone C, Albano A, Ferraroni M, Decarli A. Survival analysis with clustered observations of orthodontic brackets. *Statistics in Medicine* 28: 3483-3491 (2009).



NORMAN FIRTH

BDS (Adel) MDS (Melb) FRACDS FFOP (RCPA)
Oral Diagnostic and Surgical Sciences
Senior Lecturer

The most accurate information on the behaviour of oral lesions regarded as premalignant is based on epithelial dysplasia. Other indicators of behaviour include those related to apoptosis and cell proliferation. This is one of the research activities in which Mr Firth and the Immunopathology Group of the Sir John Walsh Research Institute are involved. In addition, they are investigating the immune response in oral premalignant and malignant lesions and metastases.

Research and Collaboration

Histological and immunohistochemical changes in oral lichen planus.

Immune profile of recalcitrant periapical lesions.

Integration of Research and Teaching: Aspects of research involving postgraduate and undergraduate students can be drawn on in clinical practice. In addition to being an oral pathologist, Mr Firth reviews current publications in the field and discusses aspects of these with students.

Recent Publications

Rosdy N, Rich AM, Firth NA, Calibre Persistent Labial Artery: Often Misdiagnosed as a Mucocoele. *International Journal of Oral & Maxillofacial Surgery* 39: 1230-1233 (2010).

Zhou J, Paul A, Bennani V, Thomson WM, Firth N. Allergies to dental alloys used in prosthodontics in New Zealand. *New Zealand Dental Journal* 106: 55-60 (2010).

Niimi M, Firth NA, Cannon RD. Antifungal drug resistance of oral fungi. *Odontology* 98: 15-25 (2010).

Love RM, Firth NA. Histopathological profile of surgically removed persistent periapical radiolucent lesions of endodontic origin. *International Endodontic Journal* 42: 198-202 (2009).



LYNDIE FOSTER PAGE

BSc BDS MComDent PGDipClinDent PhD (Otago)
Oral Rehabilitation
Senior Lecturer

Dr Lyndie Foster Page's research is concerned with oral-health-related quality of life in adolescents and children. Her epidemiological and clinical research encompasses a wide range of oral conditions, problems and settings, most notably in the fields of adolescent oral health and dental caries. She is also working with the Dunedin Multidisciplinary Health and Development Study and is involved in cross-sectional surveys and a variety of health services research and clinical projects. Her other research interest is dental education.

Research and Collaboration

Ongoing collaboration with an international team in oral-health-related quality of life in children and adolescents with the Universities of Toronto and Sheffield and work with researchers in this field in Brazil, Brunei and Mexico.

Ongoing dental education research with Dr Vivienne Anderson and Michelle Kang looking into dental professionalism and the dental educational environment. Collaborations still exist with Dr Margherita Fontana and caries intervention.

Clinical caries research with novel approaches to caries management in children (key collaborations with D Schwass, D Boyd, A Meldrum, M Swain, WM Thomson and DMG, Germany and N Innes, Dundee).

Recent Publications

Traebert J, Foster Page LA, Thomson WM, Locker D (2010). Differential item functioning related to ethnicity in an Oral Health-related Quality of Life measure. *International Journal of Paediatric Dentistry*. Published online 18 July 2010 DOI: 10.1111/j.1365-263X.2010.01066.x

Traebert J, Lacerda JT, Thomson WM, Foster Page LA, Locker D. Differential item functioning in a Brazilian-Portuguese version of the Child Perceptions Questionnaire (CPQ 11-14). *Community Dentistry and Oral Epidemiology* 38: 129-135 (2010).

Foster Page LA, Thomson WM, Locker D. Assessing the responsiveness of the CPQ 11-14 in New Zealand adolescents. *Social Sciences and Dentistry* 1: 48-53 (2010).

Gowda S, Thomson WM, Foster Page LA, Croucher NA. What difference does using bitewing radiographs make to epidemiological estimates of dental caries prevalence and severity in a young adolescent population with high caries experience? *Caries Research* 43: 436-441 (2009).



LARA FRIEDLANDER

MDS (Otago) FRACDS
Oral Rehabilitation
Senior Lecturer

Lara Friedlander is a new and emerging researcher and member of the Immunopathology Research Group of the Sir John Walsh Research Institute. She has developed research themes in pulpal biology, regeneration and angiogenesis; she is also active in research on endodontic curriculum development and teaching. Research on pulpal biology, especially in immature permanent teeth, has led to publication of an extensive review article and enrolment in a PhD to take this further. Since 2009, two substantial grant applications have been awarded to support this research. As main author, she has had a manuscript on endodontic teaching accepted for publication. This work is on-going and now investigating outcomes.

Lara is a co-supervisor of clinical doctorate students and has had three successful grant applications associated with these. This broader research pertains to endodontic practice and disease; three manuscripts are in preparation. As part of the Immunopathology group, Lara assists in advising on projects.

Research and Collaboration

The scope of this research during 2009-2010 has encompassed studies relating to three themes: pulp biology regeneration and angiogenesis, clinical practice and disease, and endodontics in dental education.

Within Lara's personal interest area of pulp biology, collaboration with members of the Immunopathology Research Group across disciplines of oral biology, medicine and pathology, periodontology and endodontics has assisted in project design, techniques and the interpretation of findings.

Research on clinical practice and endodontic radiography is ongoing in collaboration with Associate Professor Nick Chandler. Together with Associate Professor Nick Chandler and Mrs Tina Hauman, studies are also investigating management of the root-end during endodontic surgery.

Collaboration with Dr Vivienne Anderson has resulted in robust evaluation of a new endodontic module within the endodontic curriculum. With the use of multiple forms of assessment, this is unique in Endodontic education.

Recent Publications

Friedlander LT, Cullinan MP, Love RM. Stem cells and their potential role in apexogenesis and apexification. *International Endodontic Journal* 42: 955-962 (2009).

Al-Dameh A, Friedlander LT. Time saving and fatigue reduction in Endodontics. *New Zealand Endodontic Journal* 41: 16-22 (2010).



CATHARINA HAUMAN

BChD MMedSci (Pret) MDS (Otago)
Oral Rehabilitation
Senior Lecturer

Tina Hauman is researching the determination of bacterial viability in dentine by fluorescence. A novel technique, using Live-dead stain and confocal microscopy, has been developed for *ex vivo* determination of bacterial infiltration, distribution and viability in dentinal tubules. This technique has been applied to test the efficacy of different disinfection methods on resected root-end cavities and has possible clinical implications for apical surgery. Another study used this method to detect viable bacteria in the dentinal tubules of teeth from different age groups, showing that younger teeth have a denser bacterial infiltrate near the canal lumen, with a decrease in bacterial load from coronal to apical along the tooth root. These roots were then examined under the scanning electron microscope; dentinal tubules were counted to correlate the bacterial density with dentinal tubule density along the root length and in roots from different age groups. This research is related to patient care and treatment outcome.

Research and Collaboration

This research has been done in collaboration with Dr Geoff Tompkins, Dr Jonathan Leichter, Dr Ionut Ichim, Associate Professor Nick Chandler and the Electron and Confocal Microscope Unit (Department of Anatomy).

Recent Publications

Friedlander LT, Chandler NP, Hauman CHJ, Heays A, Grierson L, Loomans R. Surface roughness of resected root-ends using recommended burs; an operating microscope study. *International Endodontic Journal* 42: 1149 (2009).

Hauman CHJ, Aziz A, Tompkins GR, Chandler NP, Leichter JW. Root-end cavity disinfection with chlorhexidine and laser. *International Endodontic Journal* 42: 1149 (2009).

Aziz A, Hauman CHJ, Tompkins GR, Chandler NP. Infection at the root apex: a confocal microscope study of bacterial viability. *International Endodontic Journal* 42: 1150 (2009).



LIHONG HE

BDS (West China Med Sci) DDS (Sichuan) PhD (Syd)
Oral Rehabilitation
Senior Lecturer

Research and Collaboration

Dr. He's primary research expertise is in the mechanical properties and microstructure of dental biomaterials and dental hard tissues. He is currently working with Professor Swain and other staff on the nanoindentation measurement and SEM observation of dental biomaterials and hard tissues, particularly with respect to the demineralization and bleaching of teeth. Collaboration with Professor Mencik at the University of Pardubice (Czech Republic) led to the development of a new testing method on the viscous property of dental polymers by nanoindentation. He also has interests on the optical properties of aesthetic materials and is currently working with Otago Biotronic Ltd. on the development of dental shade matching device.

Recent Publications

He LH, Xu Y, Purton DG. In vitro demineralization of the cervical region of human teeth. *Archives of Oral Biology*, doi:10.1016/j.archoralbio.2010.11.009 (2010).

He LH, Purton DG, Swain MV. A suitable base material for composite resin restorations: Zinc oxide eugenol. *Journal of Dentistry* 38: 290-295 (2010).

He LH, Jansen van Vuuren L, Planitz N, Swain MV. A micro-mechanical evaluation of the effects of die hardener on die stone. *Dental Materials Journal* 49: 433-437 (2010).

Mencik J, He LH, Nemecek J. Characterization of viscoelastic-plastic properties of solid polymers by instrumented indentation. *Polymer Testing* 30: 101-109 (2010).



NICHOLAS HENG

BSc (Hons) PhD (Otago)
Oral Sciences
Senior Lecturer

Dr Heng's primary research expertise is in the field of molecular microbiology specialising in bacterial genetics and gene expression networks/pathways. His current research activities include whole genome sequencing (oral bacteria), oral metagenomics (characterisation of the microbial composition from the oral cavity), and bioinformatics, all in relation to oral biology.

Research and Collaboration

The scope of research conducted by Dr Heng's group during 2009-2010 included:

- (1) Microbial (bacterial) diversity of the human oral cavity in health and disease (periodontal disease and dental caries) using the GS-FLX Titanium high-throughput DNA sequencing system;
- (2) Completing the genome of *Streptococcus salivarius*, one of the more prominent bacterial species inhabiting the oral cavity. The group wishes to reveal the genetic secrets that allow *S. salivarius* to be such a successful oral coloniser; and
- (3) Characterisation of potential mutations conferring triclosan resistance in oral bacteria.

Within the Faculty of Dentistry, he currently has ongoing collaborations with Professor G.J. Seymour and Associate Professor M.P. Cullinan (Discipline of Periodontics), and Associate Professor B.K. Drummond (Discipline of Paediatric Dentistry) in relation to the metagenomic projects. In addition, he collaborates with Professor J.R. Tagg (Department of Microbiology & Immunology, Otago School of Medical Sciences) in the field of bacterially-derived antimicrobial proteins (bacteriocins), focusing on the genetic aspects. Among the aims of the genome sequencing projects are: (a) uncovering new antimicrobial proteins produced by *S. salivarius* which could be useful in the development of new oral probiotic preparations and (b) determining whether there are any virulence factors encoded by the genomes, in order to verify the "safety" of the species for use as probiotics. The triclosan resistance project is an ongoing international collaboration with Dr P.S. Bird (University of Queensland, Australia).

Recent Publications

Seymour GJ, Cullinan MP, Heng NCK. *Methods in Molecular Biology, Vol. 666: Molecular techniques and applications in oral biology*. Humana Press, U.S.A. (2010).

Heng NCK, Stanton JL. Oral bacterial genome sequencing using the high-throughput Roche Genome Sequencer FLX system, pp.197-218, In G.J. Seymour, M.P. Cullinan and N.C.K. Heng (eds.), *Methods in Molecular Biology, Vol. 666: Molecular techniques and applications in oral biology*. Humana Press, U.S.A. (2010).

Swe PM, Heng NCK, Cook GM, Tagg JR, Jack RW. Identification of DysI, the immunity factor of the streptococcal bacteriocin dysgalactin. *Applied and Environmental Microbiology* 76: 7885-7889 (2010).

Wescombe PA, Heng NCK, Burton JP, Tagg JR. Something old and something new: an update on the amazing repertoire of bacteriocins produced by *Streptococcus salivarius*. *Probiotics and Antimicrobial Proteins* 2: 37-45 (2010).



ANN HOLMES

BSc (Hons) PhD (Lond)

Oral Sciences

Senior Research Fellow

Dr Holmes' research field is the molecular biology of oral microbes, in particular the oral commensal fungus, *Candida albicans*, which can cause mucosal and systemic infections in humans.

In 2009 and 2010, Dr Holmes co-authored 7 articles in a career-to-date total of 55 papers in peer-reviewed journals; she was co-author on 8 presentations to National and International scientific conferences, including one as first author and presenter.

During this period, Dr Holmes had significant (co-investigator) involvement in three successful research grants, including: an equipment grant from the Lottery Grants Board, 2009; "Microplate Detection for Dental and Medical Research" (Spectrofluorimeter); awarded to RD Cannon, AR Holmes and BC Monk; NZ\$71,930; "Targeting melanoma initiation and progression: developing ABCB5 inhibitors" awarded by the NZ HRC (International Investment Opportunities Fund) 2009 to Prof RD Cannon, AR Holmes, MV Keniya and Prof L Sklar; NZ\$333,622; and an R03 (National Institutes of Health, USA) grant 2009 to Prof RD Cannon US\$26,000.

Dr Holmes is co-supervisor of six PhD students (due for completions between 2009 and 2011) and two DCLinDent students (due for completions between 2012 and 2013).

Research and Collaboration

Current projects and collaborations are listed below.

The involvement of yeast plasma membrane efflux pumps in resistance to antifungal drugs; and membrane protein structure and function. Collaborators: Professor RD Cannon, Dr BC Monk, Dr E Lamping, Dr K Niimi Dr M Niimi Dr M Keniya (University of Otago); Professor Larry Sklar (University of New Mexico, USA); Dr Susumu Kajiwara, (Tokyo Institute of Technology); Prof Shiguru Abe, Teikyo University Institute of Medical Mycology, Tokyo, Japan.

C. albicans biofilms on voice prostheses. Collaborators: Professor RD Cannon, Mr Karl Lyons, Associate Professor Patrick Dawes (University of Otago); Dr Ali Hodgkinson, Dr Liz Carpenter, Dr Brendan Haigh, Dr Tom Wheeler (AgResearch Ruakura); Professor Colin Bingle (University of Sheffield, UK).

Cloning and expression of the *C. albicans* ADH genes and role of *C. albicans* acetaldehyde production in oral cancer progression. Collaborators: Professor RD Cannon, Associate Professor Alison Rich, (University of Otago) Ms Marina Bakri (University of Malaya).

The role of the ABCB5 human ABC transporter in the resistance of melanoma to chemotherapy. Collaborators: Professor RD Cannon, Dr M Keniya (University of Otago); Professor Larry Sklar (University of New Mexico, USA); Dr Michael Gottesman (National Institutes of Health, Bethesda, USA).

Developing assay for discovery of efflux pump inhibitors. Collaborators: Professor RD Cannon, Dr BC Monk, Dr E Lamping, Dr K Niimi Dr M Niimi Dr M Keniya (University of Otago); Professor Larry Sklar (University of New Mexico, USA); Dr Susumu Kajiwara, (Tokyo Institute of Technology); Prof Shiguru Abe, Teikyo University Institute of Medical Mycology, Tokyo, Japan.

Saliva and *C. albicans* adherence. Collaborators: Professor RD Cannon, Mr Karl Lyons, Associate Professor Patrick Dawes, Associate Professor Anita Nolan (University of Otago); Dr Ali Hodgkinson, Dr Liz Carpenter, Dr Brendan Haigh, Dr Tom Wheeler (AgResearch Ruakura); Professor Colin Bingle (University of Sheffield, UK).

Recent Publications

Ivnitski-Steele I, Holmes AR, Lamping E, Monk BC, Cannon RD, Sklar LS. Identification of Nile Red as a fluorescent substrate of *Candida albicans* ABC and MFS transporters. *Analytical Biochemistry* 394: 87-91 (2009).

Cannon RD, Lamping E, Holmes AR, Niimi K, Baret PV, Keniya MV, Tanabe K, Niimi M, Goffeau A, Monk BC. Efflux-mediated fungal drug resistance. *Clinical Microbiology Review* 22: 291-321 (2009).

Lamping E, Baret PV, Holmes AR, Monk BC, Goffeau A, Cannon RD. Fungal PDR transporters: phylogeny, topology, motifs and function. *Fungal Genetics and Biology* 47: 127-42 (2010).

Cannon RD, Lyons KM, Chong K, Holmes AR. Adhesion of yeast and bacteria to oral surfaces. In Seymour GJ, Cullinan MP, Heng, NCK (Eds.) *Oral Biology* 103-124 (2010). New York, Springer.



LUDWIG JANSEN VAN VUUREN

BTechDent NatDipDentTech (Technicon Pretoria) MTechDent (Tshwane UT)
Oral Rehabilitation
Lecturer

Ludwig's research interests are the mechanical properties of biomaterials and their application in the dental technology field, with current involvement in research groups investigating aspects of the effect of different manufacturing procedures on the properties of alloys and ceramics used in dentistry.

He also has a special interest in understanding the microstructure of reptile tooth enamel and relating the arrangement of these structures to their mechanical properties.

Recent Publications

He LH, Jansen van Vuuren L, Planitz N, Swain VM. A micro-mechanical evaluation of the effects of die hardener on die stone. *Dental Materials Journal* 29: 433–437 (2010).



ROSEMARY KARDOS

BSc PGDipTertT (Otago) MNZIP
Oral Sciences
Senior Lecturer

Rosemary's interests in higher education research include curriculum development, inquiry based learning, and educational outcomes for students in professional programmes.

Research and Collaboration

Research is continuing into the development of learning skills by students as they progress through their three-year degree programme following the introduction of this novel educational initiative. This work is undertaken in collaboration with Russell Butson, HEDC.

New Zealand has taken a lead role to improving children's oral health through the provision of oral health education and meeting clinical treatment needs for children. Dental therapy practice has recently been introduced in the United States of America. There are collaborations with Professor D. Nash, University of Kentucky, Kentucky (USA) and Alaskan Dental Health Aide education, coordinated through Dr M. Williard, Anchorage, Alaska (USA).

The potential of collaborative practice models in the provision of primary dental care within the oral health care delivery system in the U.S. with UCSF and the Pew Children's Dental Campaign.

Research that will contribute to a study of the international literature on the work of dental therapists (conducted by Professor Nash in response to a request from the Kellogg Foundation) is being undertaken with Susan Moffat.

Recent Publications

Kardos RL, Meldrum AM, Moffat SM. The University of Otago. Tsang AKL. (Ed.) In *Oral Health Therapy Programs in Australia and New Zealand – Emergence and Development*. Queensland: Knowledge Books and Software pp75-98 (2010).

Kardos RL, Cook JM, Butson RJ, Kardos TB. The development of an e-Portfolio for lifelong reflective learning and auditable professional certification. *European Journal of Dental Education* 13: 135-141 (2009).

Coates DE, Kardos TB, Moffat SM, Kardos RL. Educational perspective and progression – Dental Therapists and Dental Hygienists for the New Zealand environment. *Journal of Dental Education* 73: 1005-1012 (2009).



Butson R, Cook JM, Kardos R. The Oral Health e-Portfolio: A three-year project. In *The Learning Portfolio. Reflective Practice for Improving Student Learning*. Zubizarreta J. (Ed.) San Francisco, Jossey-Bass pp97 – 108 (2009).

THOMAS KARDOS

MDS PhD (Otago) FFOP (RCPA)
Professor of Oral Biology and Oral Pathology
Deputy Dean
Associate Dean (Postgraduate Studies)
Head, Department of Oral Rehabilitation

With the rapid development of new technologies to enhance student learning and professional development, one of the challenges for the Faculty is to take advantage of the benefits that technology offers to enhance the continuum of professional growth concurrent with the acquisition of knowledge and understanding of scientific and social concepts, and an awareness of cultural relationships. The net-generation of learners can be identified as eager adopters of modern technologies; however, anecdotal data from classroom interactions suggest that many of the digital resources made available are not fully utilised. The application of new technologies to enhance students' vocational preparation and the achievement of competence presents challenges to educators. Research into education strategies, including the development and application of new technologies (e.g. ICT to enhance inquiry-based learning) is continuing with comparisons to international experiences recently completed.

Quality assurance processes for undergraduate and postgraduate programmes show significant variations between schools and countries, with each institution accepting responsibility for their own processes; however, several common themes prevail. Internationalisation of curricula and globalisation have brought into focus the need for alignment of elements of the education and training in the diverse disciplines in dentistry. The Faculty has a significant advantage over many other Schools in that programmes are provided at the undergraduate and postgraduate levels to enable graduates to register as dentists and dental specialists, dental hygienists, dental therapists and dental technologists with the New Zealand Dental Council.

Research and Collaboration

Professor Kardos' expertise has been recognised by the American Association of Public Health Dentistry with an invitation to attend and present at a meeting aimed at the introduction of academic programmes in dental therapy across the United States. This project, with collaborative research is continuing.

A comparison of the Otago Bachelor of Dental Surgery programme with some European programmes based on the Bologna Declaration has recently been completed in association with Dr Vinkka-Puhakka, Turku University.



Recent Publications

Kardos RL, Cook JM, Butson RJ, Kardos TB. The development of an e-Portfolio for lifelong reflective learning and auditable professional certification. *European Journal of Dental Education* 13: 135-141 (2009).

Coates DE, Kardos TB, Moffat SM, Kardos RL. Educational perspective and progression – Dental Therapists and Dental Hygienists for the New Zealand environment. *Journal of Dental Education* 73: 1005-1012 (2009).

MIKHAIL KENIYA

MD Kandidat Nauk (Rostov State)
Oral Sciences
Research Fellow

Mikhail Keniya's main scientific interest is in the mechanisms of microbial resistance to environmental stressors. He studies the enzymology, molecular genetics and structural biology of membrane transporters, and carries out compound library screening.

During 2009-2010, Mr Keniya was a co-investigator on research grants awarded to Professor Richard Cannon (NIH grant "Fungal transporters: from resistance to new antifungals", 2004-2009) and to Ann Holmes (NZ HRC-IIOF grant "Targeting melanoma initiation and progression: developing ABCB5 inhibitors", 2009).

Research and Collaboration

Mr Keniya's primary research focus was on the heterologous expression of the human-melanoma-associated transporter ABCB5 in yeast. Multiple genetic constructs were made, expressed in yeast and characterized. The resistance phenotype was enhanced using a 2-step random mutagenesis approach. This provided significant progress towards a yeast-based screening system for inhibitors of hsAbcb5p.

The other research area involved screening libraries of low molecular weight synthetic compounds obtained from the German chemical company MicroCombiChem. The collaboration was established by Dr. Brian Monk and led to a three-year Marsden fund project, starting in 2011. The response of yeast strains over-expressing membrane transporters which confer drug resistance in *Candida* identified compounds that were used to create structurally related "Families" for further rounds of screening. Some promising (potent ~ 1 μ M, stable soluble and non toxic) inhibitors of CaMdr1p were identified. These compounds belong to different but structurally related families. They are expected to provide insight into the structure of inhibitor binding sites and some may be prototype drugs.

Recent Publications

Cannon RD, Lamping E, Holmes AR, Niimi K, Baret PV, Keniya MV, Tanabe K, Niimi M, Goffeau A, Monk BC. Efflux-mediated fungal drug resistance. *Clinical Microbiology Review* 22: 291-321 (2009).



JULES KIESER

BSc BDS PhD DSc (Witw) FLS FDSRCSEd FFSSoc FICD
Director, Sir John Walsh Research Institute
Professor of Oral Biology
Associate Dean (Research)

Jules is an oral biologist with special interests in the evolution of dental and masticatory adaptation, as well as in the more defined issues of enamel morphology, toothwear and the biomechanics of swallowing.

His most recent work has been on tongue pressure changes and bolus viscosity, and enamel microstructure in extinct and extant dolphins, as well as dental maturation in different New Zealand and Pacific populations. Earlier work focused on the relationship between diet and tooth wear in pre-contact Maori populations, the structure and function of the dentition in the tuatara *Sphenodon punctatus*, and the evolution of the human mandible.

In collaboration with scientists from ESR, he developed an entire postgraduate forensic science programme. This work provided the basis for a series of projects and papers focusing on the bacterial determinants of marine decomposition, trauma to bone, skin and textiles, the biomechanics of cranial gunshot wounds, as well as the forensic separation of body fluids by means of MtDNA, bacterial fingerprinting of bitemarks and the use of Raman microscopy in separating buccal and vaginal cells.

Research and Collaboration

Professor Kieser collaborates with the following persons or institutions external to the University of Otago.

Dental microstructure – Prof Christopher Dean, Dr Marc Jones, UCL; Prof Nicola Nelson, Victoria University; Dr Sabine Bechtle, Technical University of Hamburg.

Masticatory Biomechanics – Prof Oliver Rohrlé, University of Stuttgart; Prof John Bronlund and Dr Kylie Foster, Massey University; Prof Andrew Pullan and Martyn Nash Auckland University; Dr Lidia Motoi, Plant & Food Research.

Swallowing – Dr MaggieLee Huckabee, Van Der Veer Institute.

Forensic Science – Drs Michael Taylor and Stephen Cordiner, ESR; Prof Debbie Carr, Cranfield University; Prof Michael Tsokos, Charité Berlin; Prof Maryna Steyn, Pretoria University; Dr Helen Liversidge, Queen Mary Hospital.

Recent Publications

Kieser JA, Kennedy D, Bolter C, Swain M, Waddell JN, Singh B. Tongue pressure patterns during water swallowing. *Dysphagia* 25: 11-19 (2009).

Kieser JA, Tkatchenco T, Dean C, Jones MEC, Duncan W, Nelson NJ. Microstructure of dental hard tissues and bone in the tuatara dentary, *Sphenodon punctatus* (Diapsida: Lepidosauria: Rhynchocephalia) In Koppe T, Meyer G & Alt KW Eds Comparative Dental Morphology. *Frontiers of Oral Biology* 13: 80-85 (2010).

Kieser JA, Bolter C, Raniga N, Waddell JN, Swain MV, Farland G. Tongue-palate interactions during swallowing. *Journal of Texture Studies* (DOI: 10.1111/j.1745-4603.2010.00274.x) (2010).

Dickson GC, Poulter R, Maas EW, Probert PK, Kieser JA. Marine bacterial succession as a potential indicator of postmortem submersion interval. *Forensic Science International* DOI:10.1016/j.forsciint.2010.10.016. (2010).



ERWIN LAMPING

DiplIng (Hons) DrPhil (Graz)

Oral Sciences

Senior Research Fellow

Dr Lamping's research in the past few years has focused mainly on the study of drug resistance mechanisms of fungal pathogens and human cancer cells. During the 2009–2010 period, Dr Lamping studied the structure, function, and regulation of expression of the drug target ERG11 and ABC and MFS multidrug efflux transporters of human fungal pathogens and of cancer cells.

In that time, he co-authored five journal articles and one invited book chapter (three as first author) and was co-author on nine presentations to national and international scientific conferences or meetings, including three as first author and presenter. He was also Co-PI of two successful research grants awarded to Professor Cannon: NZ FRST (2007–2010) \$ 1,755,000; *A novel protein expression system for human membrane protein analysis and drug discovery*; and Japan Health Science Foundation (2008–2009) \$ 55,000; *Structure-directed drug design*. Dr Lamping is also co-supervisor of two PhD students.

Research and Collaboration

Current projects and collaborations:

The involvement of yeast plasma membrane efflux pumps in resistance to antifungal drugs; and membrane protein structure and function. Collaborators: Professor RD Cannon, Dr AR Holmes, Dr BC Monk, Dr K Niimi, Dr M Niimi, Dr M Keniya, Dr J Tyndall and Professor K Krause (University of Otago); Professor Larry Sklar (University of New Mexico, USA); Dr Susumu Kajiwara, (Tokyo Institute of Technology) Tokyo, Japan.

Developing assay for discovery of efflux pump inhibitors. Collaborators: Professor RD Cannon, Dr BC Monk, Dr AR Holmes, Dr K Niimi, Dr M Niimi, Dr M Keniya (University of Otago); Professor Larry Sklar (University of New Mexico, USA); Dr Susumu Kajiwara, (Tokyo Institute of Technology), Tokyo, Japan.

Study of the innate azole resistance mechanism and elucidation of the genome organization of *Candida krusei*. Collaborators: Prof. P Magee and Dr. B Magee (University of Minnesota, MN, USA).

Recent Publications

Lamping E, Ranchod A, Nakamura K, Tyndall JD, Niimi K, Holmes AR, Niimi M, Cannon RD. Abc1p is a multidrug efflux transporter that tips the balance in favor of innate azole resistance in *Candida krusei*. *Antimicrobial Agents and Chemotherapy* 53: 354-369 (2009).

Lamping E, Baret PV, Holmes AR, Monk BC, Goffeau A, Cannon RD. Fungal PDR transporters: phylogeny, topology, motifs and function. *Fungal Genetics and Biology* 47: 127-142 (2010).

Lamping E, Cannon RD. Use of a yeast-based membrane protein expression technology to overexpress drug resistance efflux pumps. In Seymour GJ, Cullinan MP, Heng NCK (Eds.) *Oral Biology* pp 219-250. New York: Springer (2010).

Niimi K, Monk BC, Hirai A, Hatakenake K, Umeyama T, Lamping E, Maki K, Tanabe K, Kamimura T, Ikeda F, Uehara Y, Kano R, Hasegawa A, Cannon RD and Niimi M. Clinically significant micafungin resistance in *Candida albicans* involves modification of a glucan synthase catalytic subunit *GSC1 (FKS1)* allele followed by loss of heterozygosity. *Journal of Antimicrobial Chemotherapy* 65: 842-852 (2010).



JONATHAN LEICHTER

BA (Connecticut) DMD (Tufts) CertPeriodontology (Harvard)
Oral Sciences
Senior Lecturer

The scope of Mr Leichter's research demonstrates his commitment to multidisciplinary collaboration. He has conducted research and has had publications in high-ranking dental journals in the disciplines of periodontology, microbiology, cariology, dental trauma, endodontics and dental materials. Mr Leichter has received a number of research grants, negotiated major equipment donations and facilitated student research stipends. He has been a supervisor for DCLinDent and PhD student research theses and undergraduate research projects. These collaborations have resulted in peer-reviewed publications and peer-reviewed conference proceedings. On invitation, he has presented his research in New Zealand, Australia, United States and Japan. In recognition of his research expertise, Mr Leichter has been selected to be on the Asia-Pacific Oral Health Research Panel, the editor of the Oral Health Research Review, and to act as a reviewer for several international peer review journals.

Research and Collaboration

Much of Mr Leichter's research during this period has been focused on laser applications in dentistry. He has conducted research on quantifying autofluorescence-controlled Er:YAG laser removal of carious dentine, and laser disinfection of infected root canals, and was involved in several projects evaluating root-end cavity disinfection with Er:YSSG lasers. A major focus of his research was on laser applications in periodontology, comparing fluorescence-guided Er:YAG laser debridement and mechanical therapy for the nonsurgical treatment of chronic periodontitis. This work validated lasers as the only monotherapy for periodontitis that is comparable to the gold standard of scaling and root planing.

Recent Publications

Ohlrich EJ, Cullinan MP, Leichter JW. Diabetes, Periodontitis and the subgingival microbiota. *Journal of Oral Microbiology* 2: 5818-5822 (2010).

Schwass DR, Swain MV, Purton DG, Leichter JW. A system of calibrating micro-tomography for use in caries research. *Caries Research* 43: 314-321 (2009).

Allsobrook OFL, Leichter JW, Holborow D, Swain M. Descriptive Study of the Longevity of Dental Implant Surgery Drills. *Clinical Implant Dentistry and Related Research*. 2009. doi: 10.1111/j.1708-8208.2009.00205.x.



ROBERT LOVE

MDS PhD (Otago) FRACDS
Oral Diagnostic and Surgical Sciences
Professor and Head of Department

Professor Love's prime area of research is based on the mechanisms involved in dentine colonisation and infection, with an emphasis on molecular aspects of bacterial interactions with substances. This work is the only one to show that bacterial infection of dentine follows all of the principles of colonisation, an important concept to determine because understanding should lead on to prevention. The quality of this work has been recognised in the way of being invited to write review articles in this field as well as forming the basis of a book chapter in Endodontic microbiology. Current research is focussed on relating the microbial infection aspect of dentine/endodontic infection to disease progression/pathology, with the histopathological and immunological profile of refractory periapical lesions forming the basis of extension into this field.

Determination of disease patterns is critical to public health and another area of research involves determining epidemiological aspects of endodontic disease in the New Zealand population. Dental injury is a part of this and we have published the only publication to describe and quantify dental injuries in a New Zealand population. Further work is continuing on the aspects of how endodontic disease presents in a New Zealand population.

Research and Collaboration

Immunohistopathological aspects of bacterial-related periapical lesions is being conducted as part of the Immunopathology group of the SJWRI.

PhD student research into ceramic restorations is being conducted as part of the Biomaterials group of the SJWRI.

PhD student research into microbial infection of maxillofacial prosthesis is being conducted as part of the Molecular oral microbiology group of the SJWRI.

Bacterial invasion of dentine is being conducted with Professor H. Jenkinson, University of Bristol, UK.

Endodontic microbiology is being conducted as part of the Molecular Microbiology group of the SJWRI.

Epidemiology of endodontic disease is being conducted as part of the Epidemiology Group of the SJWRI.



Recent Publications

Love RM. *Microbiology of Dentinal Tubule Infection*. In: *Endodontic microbiology* Fouad AF ed, Blackwell Munksgaard, pp22-39, Ames, IA: Wiley-Blackwell (2009).

Patel KJ, De Silva H, Tong DC, Love RM. Concordance between clinical and histopathologic diagnoses of oral mucosal lesions. *Journal of Oral and Maxillofacial Surgery* 69: 125-33 (2010).

Becconsall-Ryan K, Tong D, Love RM. Radiolucent inflammatory jaw lesions—a twenty year analysis. *International Endodontic Journal* 43: 859-865 (2010).

Love RM, Firth N. Histopathological profile of surgically removed persistent periapical radiolucent lesions of endodontic origin. *International Endodontic Journal* 42: 198-202 (2009).

KARL LYONS

MDS (Otago) CertMaxillofacialPros (UCLA) FRACDS
Oral Rehabilitation
Senior Lecturer

Mr Lyons has been enrolled in a PhD (part-time) investigating microbial adhesion to obturator prostheses. These prostheses are used to dentally restore surgical resection defects in the maxilla of patients who have had surgery to remove cancer in the palate or sinuses. He has been carrying out the clinical and laboratory parts of this study collecting data, but has not yet submitted any manuscripts for publication. Mr Lyons has presented 3 posters and 5 oral presentations based on work from this study.

Research and Collaboration

Mr Lyons is writing his PhD thesis, as well as working with doctoral, masters and undergraduate students.

Recent Publications

Abduo J, Lyons KM, Bennani V, Waddell JN, Swain MV. A comparison of fit of CNC-milled titanium and zirconia frameworks to implants. *Clinical Oral Implants Dentistry and Related Research*. Epub date 2010/11/04; doi: 10.1111/j.1600-0501.2010.02019.x. (2010).

Cannon RD, Lyons KM, Chong K, Holmes AR. Adhesion of yeast and bacteria to oral surfaces. In Seymour GJ, Cullinan MP, Heng, NCK (Eds.) *Oral Biology* 103-124 (2010). New York, Springer.

Al-Amleh B, Lyons KM, Swain MV. Clinical trials in zirconia: a systematic review. *Journal of Oral Rehabilitation*. 37: 641-652 (2010).

Abduo J, Bennani V, Waddell JN, Lyons KM, Swain MV. Assessing the fit of implant fixed prostheses: a critical review. *International Journal of Oral and Maxillofacial Implants* 25: 506-515 (2010).



SUNYOUNG MA

BDS DCLinDent (Otago)
Oral Rehabilitation
Senior Lecturer

Research and Collaboration

After completing her Doctor of Clinical Dentistry thesis titled "Marginal bone loss around two implants supporting mandibular overdentures", Dr Ma continues to work with the Oral Implantology Research Group collecting long-term prospective data. Her main focus of research lies on bone resorption associated with implant prostheses, long-term implant success and prosthodontic maintenance. Dr Ma is also a PhD supervisor in a project examining zirconia implants and overdentures for completely edentulous patients.

Recent Publications

Ma S, Tawse-Smith A, Thomson WM, Payne AGT. Marginal bone loss with mandibular two-implant overdentures using different loading protocols and attachment systems: 10-year outcomes. *International Journal Prosthodontics* 23: 321-332 (2010).

Ma S, Payne AGT. Marginal bone loss with mandibular two-implant overdentures using different loading protocols: A systematic literature review. *International Journal of Prosthodontics* 23: 117-126 (2010).



EITHNE MACFADYEN

BDS (Glas) FDSRCPSGlas
Oral Diagnostic and Surgical Sciences
Senior Lecturer

Eithne MacFadyen has been involved in developing two DCLinDent research projects related to Special Needs Dentistry.

Research and Collaboration

The first of the above studies relates to developing an outline for the establishment of a Special Needs Dentistry service for Malaysia, based on the New Zealand experience. This work is being carried out with support and input from the Ministry of Health in Malaysia and with one of their staff as the field investigator.

The second study will focus on the oral health status of elderly individuals admitted to Dunedin Hospital for medical assessment. They wish to establish whether the widely reported poor oral status of rest home residents is already evident at this time or develops subsequently. This work is being carried out in collaboration with Professor John Campbell and the staff of the Care of the Elderly service, Otago District Health Board.



ALISON MELDRUM

MDS (Otago)
Oral Sciences
Senior Lecturer

Alison Meldrum's main areas of research include the allied dental professionals workforce, childhood caries, and student learning and acquisition of knowledge.

Research and Collaboration

Improving the oral health of preschoolers – developing a workable and effective tool for oral health professional.

This project was funded by a NZDA research grant and involved Annette Hannah, Dawn Coates and Wendy Aitken. This research aims to investigate whether Motivational Interviewing (MI) is an effective chairside education tool for the caregivers of young children. Underpinning oral health promotion is 'the process of enabling people to increase control over, and to improve, their health' (MOH, 2004). This principle of enabling people is at the heart of MI, which is a patient-centred method designed to augment an individual's motivation to change a problematic behaviour. This research developed Motivational Interviewing methodology for use in New Zealand Dental Clinics with the caregivers of young children (aged 6–24 months) and examined its efficacy in a controlled environment.

An evaluation of the acceptability of primary health care nurses delivering oral health messages. This pilot study is in collaboration with Susan Moffat, Dawn Coates and Wendy Aitken, and supported by a University of Otago Research Committee grant. There is limited international research on primary health care providers' involvement in oral health care promotion. Research in Australia found that practice nurses have no confidence or self-perceived legitimacy to deliver oral health anticipatory guidance, and that there was a clear need for clear and consistent oral health information and agreed roles between disciplines. There is a need to provide intervention packages and effective training for practice nurses to enable them to undertake oral health promotion activities.

Three general practices in the Dunedin area were recruited. Practice nurses from each complete a brief training programme to enable them to deliver a brief oral health message to infants at their five-month immunisation appointments.

Recent Publications

Moffat SM, Coates, DE, Meldrum AM. New Zealand's changing oral health workforce. A dental practitioner's guide to dual trained dental therapists/dental hygienists. *New Zealand Dental Journal* 6: 57-60 (2009).

Kardos RL, Meldrum AM, Moffat SM. The University of Otago. In: Tsang TKL (ed.) *Oral Health Therapy Programs in Australia and New Zealand –Emergence and Development*. Knowledge Books and Software Publishing, Queensland pp75-98 (2010).

Tang A, Moffat SM, Kardos RL, Meldrum AM, Walsh L. Looking forward to the future: Directions and Innovations. In: Tsang TKL (ed.) *Oral Health Therapy Programs in Australia and New Zealand –Emergence and Development*. Knowledge Books and Software Publishing, Queensland (2010).



TRUDY MILNE

PhD (Qld UT) NZCS
Oral Sciences
Research Fellow

Dr Milne's research interests are focused in the area of gene expression, with the goal of furthering an understanding of the immunopathogenesis of periodontal disease and the relationship between periodontal and systemic diseases. The development of a multiplex qPCR assay for oral bacteria has allowed further investigation into relationships between key oral pathogenic organisms.

Research and Collaboration

Current research areas include: "The characterisation of natural regulatory T cells and Th17 cells in human periodontal disease", a PhD research project in collaboration with Professor Gregory Seymour; Professor Alison Rich and PhD candidate Praveen Parachuru; an investigation into "The impact of bisphosphonates on gene expression in human gingival fibroblasts", a collaboration with Dr Dawn Coates and Associate Professor Mary Cullinan; and the development of a multiplex qRT-PCR assay as a tool for determining periodontal treatment effectiveness has led to a study with Mr Jonathan Leichter and Associate Professor Mary Cullinan comparing bacteria levels before and after conventional hand scaling and Er:YAG laser treatments. The same assay has been used to undertake a "Microbiological study of oral implants in molar sockets", a collaboration with Associate Professor Mary Cullinan and PhD candidate Mo'men Atieh. Dr Milne also interacts with numerous DClinDent and PhD students in the laboratory.

Recent Publications

Milne TJ, Ichim I, Patel B, McNaughton A, Meikle MC. Induction of osteopenia during experimental tooth movement in the rat: alveolar bone remodelling and mechanostat theory. *European Journal of Orthodontics* 31: 221-231 (2009).

Chou P, Milne T. Real-time PCR focused-gene array profiling of gingival and periodontal ligament fibroblasts. In Seymour GJ, Cullinan MP, Heng, NCK (Eds.) *Oral Biology* Springer: New York (2010).



SUSAN MOFFAT

BA DPH (Otago) CertDentTherp (Wgtn)
Oral Sciences
Lecturer

Susan Moffat's PhD research centres on the establishment of the New Zealand School Dental Service (SDS). Although the SDS has been described as 'unique', and is often praised for its success, very little has been written about this Service and its dental nurses. This research will emphasise the contribution of the early dental nurses to the SDS and their views on the establishment of the Service.

Other research projects include research on dental therapy and oral health education, dental therapy workforce research and dental public health.

Research and Collaboration

University of Otago 'Targeted Research Development Programme' funding, a NZDA/MOH Oral Health Research Fund grant, and a University of Otago Research Grant (UORG) have enabled collaboration with other staff members within the Bachelor of Oral Health (BOH) Programme for research on education (dental therapy and the BOH programme), workforce (dental therapy and BOH graduates) and dental public health (preschool oral health).

In 2009 and 2010, Susan had the opportunity to collaborate with Oral Health staff in New Zealand and Australia to publish a book on the Oral Health programmes from both countries.

Recent Publications

Moffat SM, Coates DE, Meldrum AM. New Zealand's changing oral health workforce. A dental practitioner's guide to dual-trained dental therapists/dental hygienists. *New Zealand Dental Journal* 105: 57-61 (2009).

Coates DE, Kardos TB, Moffat SM, Kardos RL. Dental Therapists and Dental Hygienists Educated for the New Zealand Environment. *Journal of Dental Education* 73: 1005-1012 (2009).

Satur J and Moffat SM. A History of Oral Health Practice (dental therapy and dental hygiene) in Australia and New Zealand. In AKL Tsang (Ed.) *Oral Health Therapy Programs in Australia and New Zealand – Emergence and Development*. Queensland: Knowledge Books and Software (2010).

Kardos RL, Meldrum AM and Moffat SM. The University of Otago. In AKL Tsang (Ed.) *Oral Health Therapy Programs in Australia and New Zealand – Emergence and Development*. Queensland: Knowledge Books and Software (2010).



BRIAN C. MONK

BSc (Hons) (Well) PhD (Monash)
Oral Sciences
Senior Lecturer

Dr Monk aims to discover new ways to combat infectious disease, especially where drug resistance is important. He has used combinatorial chemistry to obtain unique peptide-based surface-targeting compound libraries. Molecular genetic manipulation of yeast and bacterial systems is used to express drug targets for effective screening of compound libraries. Bioinformatic screening has identified a group of structurally resolved antifungal drug targets that will facilitate the selection of broad-spectrum antifungals. Most of the antifungal targets he has developed are membrane proteins. These include essential P-type ATPases, fungal glucan synthase, cytochrome P450 enzymes and drug efflux pumps. Other targets include archaeobacterial DNA gyrases and bacterial sortases, fungal transcription factors, and enzymes involved in fungal riboflavin biosynthesis. The challenge of obtaining monodisperse membrane proteins for structural resolution by X-ray crystallography is well advanced, with some targets of interest in crystal trials. The yeast expression system that he patented in 2003 is used widely to express membrane proteins from a range of sources, including pathogenic fungi, plants and humans. Related research interests include defining mechanisms of echinocandin, herbicide and antimalarial resistance, expressing human drug targets for drug screening, and equipping yeast biofactories with efflux pumps to improve productivity by protecting against toxic substrates, products and metabolites.

Research and Collaboration

Advanced screens (e.g. integrated bioinformatic, structure-directed, cell-based and protein target-based screens) are applied to anti-infective drug discovery - an area neglected by the pharmaceutical industry. Specific inhibitors of drug efflux pumps have been obtained and multifunctional azoles (single compounds that hit 3 targets) that prevent multidrug efflux in pathogenic yeast are a goal. We are also creating efficient yeast biofactories, using structure-directed and screen-based discovery to overcome resistance to frontline antimalarials (artemisinin), identifying broad spectrum fungicides using essential, structurally resolved, antifungal targets, and facilitating drug discovery by crystallizing membrane protein and soluble antimicrobial targets. Other research applies proteomics to tooth development and enamel strength, uses heterologous expression to analyze the structure and function of the CAP family of proteins, aims

to define the requirements for heterologous expression in yeast of human ABCG2 (a marker of breast cancer refractory to chemotherapy), and measures anti-infective-surface interactions.

Dr Monk leads multiple projects in the Molecular Microbiology Laboratory (MML) headed by Prof. Richard Cannon. These include collaboration with team of post-doctoral fellows (Dr A Holmes, Dr E Lamping, Dr K Niimi, Dr M Keniya, Dr M Woods) studying antifungal drug targets, drug efflux mechanisms responsible for antifungal resistance and heterologous expression of membrane proteins, supported by NIH (USA), FRST IIOF and University of Otago funding. A 2008-2009 collaboration with Prof. A Goffeau and Dr P Baret (Universite Catholique de Louvain) included the phylogenetic analysis of the PDR family of efflux pumps in the model yeast *S. cerevisiae* and pathogenic fungi. The NIH-funded project (2006-09) has involved collaboration with Prof. DS Perlin (Public Health Research Institute, Newark, NJ, USA) and Prof. Abe (Teikyo University, Tokyo, Japan) for animal trials, Prof. DRK Harding (Center for Separation Science, Massey University) for the development/delivery of synthetic peptides that evolved from use of peptide combinatorial libraries, and with Dr E. Fleischer (MicroCombiChem, Weisbaden, Germany) for chemical compounds, libraries and peptide derivatives. These studies led to the award of a Marsden Fund grant to Dr Monk in 2009 entitled "Multifunctional azoles: A triple whammy designed to defeat drug resistance". This project involves an international research team that includes Prof. Goffeau, Prof. R Stroud (University of California at San Francisco), MicroCombiChem, Dr D Bellows (Centre for Biodiscovery at Victoria University of Wellington), Dr J Tyndall (National School of Pharmacy) and Dr Keniya. Collaboration with Prof. Cannon, Dr K Niimi, Astellas Pharma and the National Institute for Infectious Diseases in Japan (Dr M Niimi) since 2006 has determined the molecular basis of echinocandin resistance in *C. albicans* and *C. glabrata*. Since 2010, Dr Monk has been involved in a FRST-supported collaboration with Dr K Niimi, Prof Cannon and Dr S Bisset of AgResearch aimed at overcoming nematode resistance to drenches. In 2008-2009, the Portuguese Foundation for Science and Technology supported Dr Monk's collaboration with Prof. I Sa Correia of Instituto Superior Tecnico (IST), Lisbon, on the expression of plant efflux pumps in *S. cerevisiae* and on antimalarial discovery. Since 2007, Dr Monk has collaborated with Dr T Milne (MML) and Dr Tyndall on the structure and function of recombinant members of the family of CAP proteins. In 2010, a project that expresses novel fungal drug targets in *Escherichia coli*



was begun with Dr Tyndall. In 2008, Dr Monk began collaboration with Prof. Phil Bremer (Food Science) and Prof. J McQuillan (Chemistry) on the interaction of cells, proteins and peptides with metal surfaces of relevance to medicine and dentistry. He works with cariologist Assoc. Prof. B Drummond, materials scientist Prof. M Swain and Dr R Farah in proteomic analysis of tooth development and enamel strength in health and disease. This multidisciplinary research is exploring the hypothesis that trauma may deleteriously affect enamel development.

Recent Publications

Farah RA, Monk BC, Swain MV, Drummond BK. Protein content of molar-incisor hypermineralisation enamel. *Journal of Dentistry* 38: 591-6 (2010).

Niimi K, Monk BC, Hirai A, Hatakenaka K, Umeyama T, Lamping E, Maki K, Tanabe K, Kamimura T, Ikeda F, Uehara Y, Kano R, Hasegawa A, Cannon RD, Niimi M. Clinically significant micafungin resistance in *Candida albicans* involves modification of glucan synthase catalytic subunit *GCS1 (FKS1)* allele followed by loss of heterozygosity. *Journal of Antimicrobial Chemotherapy* 65: 842-52 (2010).

Lamping E, Baret PV, Holmes AR, Monk BC, Goffeau A, Cannon RD. Fungal PDR transporters: Phylogeny, topology, motifs and function. *Fungal Genetics and Biology* 47: 127-142 (2010).

Ivnitski-Steele I, Holmes AR, Lamping E, Monk BC, Cannon RD, Sklar LS. Identification of Nile Red as a fluorescent substrate of the *Candida albicans* ABC transporters Cdr1p and Cdr2p and the MFS transporter Mdr1p. *Analytical Biochemistry* 1: 87-91 (2009).

KATE MORGAINE

BA MPH (Otago) DipTchg
Oral Sciences
Lecturer

Public Health, Health Services Research and Health Promotion/Education. "An ounce of prevention is better than a pound of cure" Benjamin Franklin. While we all might agree with the statement, understanding just how we might prevent disease and injury is another matter. There are several aspects to prevention that range from taking personal responsibility and changing behaviour; through changing the social and physical contexts people live, work and play in, to changing policies and societal norms.

Kate Morgaine's research interests centre on assessing the need for, and evaluating the effectiveness of, a range of health promotion/education interventions to improve health, and oral health in particular; at a population rather than an individual level.

Research and Collaboration

Current research includes the following:

Assessing the utilisation of and barriers to free basic oral health care by rangatahi (young Māori people) in Taranaki. Collaboration is with members of the Taranaki DHB's Māori health, oral health and health promotion teams.

Assessing the feasibility of a community level intervention to improve the oral health of people with cardiovascular disease. Collaboration is with staff in the Oral Health department of Auckland University of Technology.

Co-investigator, International Collaborative Indigenous Health Research Partnership: Reducing the burden of disease and inequalities in health arising from chronic disease in Indigenous people. Collaborating with Waikato-Tainui health providers and with international researchers from Australia and Canada.

Recent Publications

Ayers KMS, Thomson WM, Newton JT, Morgaine KC, Rich AM. Self-reported occupational health of a sample of general dental practitioners. *Occupational Medicine* 59: 142-148 (2009).

Cryer PC, Lovelock K, Lilley R, Davidson P, Davie G, Samaarandayaka A, McBride D, Milosavljevic S, Morgaine K C. *Effective Occupational Health in Agriculture. A report of a survey of risk factors and exposures on farms.* University of Otago: Injury Prevention Research Unit (2009).



KYOKO NIIMI

DVM (Nihon Vet) PhD (Otago)
Oral Sciences
Senior Research Fellow

Dr Niimi's research interests are in microbiology/mycology research and the development of antifungal agents, with three main areas of research expertise: the molecular biology of human fungal pathogens *Candida albicans* and *C. glabrata*; the mechanisms of antifungal resistance and drug development; and heterologous protein expression in the yeast *Saccharomyces cerevisiae*.

Research and Collaboration

Dr Niimi's research scope in 2009 and 2010 was twofold.

Investigating mechanisms of echinocandin resistance in human fungal pathogens *Candida albicans* and *C. glabrata*. A novel class of antifungal agent, the echinocandins, provides new therapeutic options for the treatment of fungal infections caused by *Candida* species. The incidence of echinocandin resistance remains low; however, there are some reports of echinocandin resistant isolates from patients with treatment failure. It was found that mutations in two alleles of diploid *C. albicans* and two separate genes of haploid *C. glabrata* are required for the acquisition of high-level resistance, which may be why clinically significant echinocandin resistance is rare. Key collaborators in the project include Drs K. Maki and K. Hatakenaka of Astellas Pharma Inc., Japan; Assoc. Prof. H. Nakayama, Suzuka University of Medical Sciences, Japan; Assoc. Prof. H. Chibana and Dr K. Ueno, Chiba University, Japan; Drs A. Hirai, T. Umeyama, K. Tanabe and Niimi, M., National Institute of Infectious Diseases, Japan; Drs B. C. Monk, Woods, M. A. and Prof. R. D. Cannon of the Molecular Microbiology Laboratory, University of Otago.

Modifying the heterologous membrane expression system to maximize protein expression. The heterologous membrane expression system in baker's yeast was developed in the Molecular Microbiology Laboratory (MML). The system needs to be further improved to achieve high level expression of human membrane proteins (such as Abc1p, Abcg2p or Abcb5p) that are involved in drug resistance in human cancer cells. Mutant cells were selected which possessed higher drug efflux activity, by UV irradiation followed by genetic engineering. Key collaborators include Professor R. D. Cannon, Drs B. C. Monk, M. Niimi, E. Lamping, A. R. Holmes, M. Keniya of MML; Assoc Prof. S. Kajiwara, Tokyo Institute of Technology, Japan.

Recent Publications

Niimi K, Monk BC, Hirai A, Hatakenaka K, Umeyama T, Lamping E, Maki K, Tanabe K, Kamimura T, Ikeda F, Uehara Y, Kano R, Hasegawa A, Cannon RD, Niimi M. Clinically significant micafungin-resistance in *Candida albicans* involves modification of a glucan synthase catalytic subunit *GSC1 (FKS1)* allele followed by loss of heterozygosity. *Journal of Antimicrobial Chemotherapy* 65: 842-852 (2010).

Cannon RD, Lamping E, Holmes AR, Niimi K, Baret PV, Keniya MV, Tanabe K, Niimi M, Goffeau A, Monk BC. Efflux-mediated fungal drug resistance. *Clinical Microbiology Reviews* 22: 291-321 (2009).

Lamping E, Ranchod A, Nakamura K, Tyndall JDA, Niimi K, Holmes AR, Niimi M, Cannon RD. Abc1p is a multidrug efflux transporter that tips the balance in favor of innate azole resistance in *Candida krusei*. *Antimicrobial Agents and Chemotherapy* 53: 354-369 (2009).

Niimi K, Niimi M. Mechanisms of echinocandin resistance in pathogenic fungi. *Japanese Journal of Medical Mycology* 50: 57-66 (2009).



ANITA NOLAN

*BDentSc (Dub) LLM (Northumbria) MD (UCD) FFDRCSI
Oral Diagnostic and Surgical Sciences
Associate Professor*

Anita Nolan took up a post at the School of Dentistry at the end of 2009, having previously worked as a full-time clinical NHS Consultant in Oral Medicine in the UK, with leading national roles in specialist training in dentistry, quality assurance of specialist training, clinical negligence and as the Dental Advisor on Drugs Harm to the UK Government. Her current academic position at the Faculty of Dentistry has given the opportunity to research personal clinical interests and develop the two main research themes on the oral aspects of Crohn's Disease and Sjogren's Syndrome/Xerostomia. This research has been supported by research grants awarded by Lottery Health Research (2010), the Otago Medical Research Foundation (2010), the New Zealand Dental Association Research Foundation (2010) and the New Zealand Dental Association/Ministry of Health Research Fund (2010).

Research and Collaboration

Associate Professor Nolan is the Principal Investigator in the following two themes.

Current ongoing Oral Crohns' Disease (Orofacial Granulomatosis) research

An evaluation of the genetic associations between Crohn's Disease and Orofacial Granulomatosis (OFG). Preliminary results reported that patients with OFG alone or in combination with Crohn's Disease demonstrated a marginal trend towards IL23R, unlike the control population. This is the first report of a genetic association between OFG and Crohn's disease and, if confirmed in the ongoing larger national study, could highlight the prognostic value of oral lesions in Crohn's Disease. This research also evaluates:

The diagnostic value of a patient self-reporting questionnaire as a screening tool for Oral Crohn's Disease.

Quality of Life Studies in patients with Orofacial Granulomatosis.

The significance of environment factors in Orofacial Granulomatosis.

A comparison of genotype and phenotypes of Oral Crohn's Disease / Orofacial Granulomatosis in children and adults.

Collaborators in Oral Crohn's Disease Research:

Dr Rebecca Roberts, Biochemistry and Prof Murray Thomson, Faculty of Dentistry. Medical Collaborators include Dr Michael Schultz and Dr Pamela Jackson (Dunedin), Associate Professors Richard Geary and Andrew Day, Christchurch Medical School and Dr David Rowbotham, Auckland. International Collaborators include Dr J Mansfield, University of Newcastle, UK, and Dr Jeremy Sanderson, Kings College University, London.

Current ongoing Sjogren's Syndrome/Dry Mouth/Oral Aspects of Connective Tissue Research

Cell growth and survival characteristics (and in particular p53 isoforms) in Sjogren's Syndrome and Lymphoma. This is collaborative research with Dr. Noelyn Hung and Dr Tania Slatter, Principal Investigators, Department of Pathology and with co-investigators Professor John Highton and Mr Harsha de Silva. This is funded through a HRC grant (Dr Slatter). Other Sjogren's-related research includes: "Quality of Life Studies in Sjogren's Syndrome" and "An estimation of Decayed, Missing and Filled Teeth in Sjogren's Syndrome patients (PI). Research supervision on this topic includes: "Saliva from Dry Mouth Patients and Candida Albicans adhesion" (Co-supervisor of DClinDent with Professor Richard Cannon, main supervisor); "The Prevalence of periodontitis and oral characteristics in ankylosing spondylitis patients (Co-supervisor; with Associate Professor Mary Cullinan, principal supervisor); and "An audit of dry mouth management by primary health care professionals in the Dunedin area" (summer studentship, principal supervisor).

Recent Publications

Nolan A, Badminton J, Maguire J, Seymour RA. An evaluation of 0.2% Topical Hyaluronic Acid in the management of painful Oral Lichen Planus. *Journal of Oral Pathology & Medicine* 38: 299-303 (2009).



NINA PLANITZ

*Dipl-Ing (FH) Dental Technology
Oral Rehabilitation
Lecturer*

Nina's main focus of research is in the field of biomaterials, specifically the fracture mechanics of denture base materials. This involves the limits of denture base material in terms of its dimensional design, substructures and external influences. Using triangular beams produced with the average volume of an acrylic denture, modern denture base material can then be tested with reproducible results rather than utilizing dentures as specimens.

The knowledge gained about fracture behaviour during those tests led Nina into a broader field. Still focusing on fracture behaviour and physical and mechanical properties of various resins, Nina's main aim now is to create a synthetic bone for research applications in order to simulate bone fractures and general behaviour. The current existing materials are very expensive and often do not allow for individual moulds or anatomy. By manipulating polyurethane and resins, this research aims to find a cheaper and more adjustable solution.

Research and Collaboration

Nina also participated in other research groups, one of which focused on the effect of die hardener (refer to publication below).

Furthermore, options for research collaborations with the University of Applied Science in Osnabrück and Medcon in Bochum have been discussed, together with a project from the dental material manufacturing industry relating to denture base materials.

Recent Publications

He LH, Jansen van Vuuren L, Planitz N, Swain VM. A micro-mechanical evaluation of the effects of die hardener on die stone. *Dental Materials Journal* 29: 433–437 (2010).



DAVID PURTON

*MDS (Otago) FRACDS
Oral Rehabilitation
Associate Professor*

David Purton conducts research in the broad field of restorative dentistry. His current research projects include: investigating a novel dental ultrasonic instrument; alternative materials for typodont teeth; the antibacterial effects of endodontic irrigants; and the aetiology of non-carious cervical lesions.

Research and Collaboration

Research on a novel dental ultrasonic instrument; investigation of alternative materials for typodont teeth; investigation of the antibacterial effects of endodontic irrigants; investigation into the aetiology of non-carious cervical lesions.

Collaborations with staff in the same and other departments and with undergraduate students.

Recent Publications

Schwass DR, Swain MV, Purton DG, Leichter JW. A system of calibrating micro-tomography for use in caries research. *Caries Research* 43: 314-321 (2009).

Purton DG, Chandler NP, Monteith BD, Qualtrough AJ. A novel instrument to determine pulp proximity. *European Journal of Prosthodontics and Restorative Dentistry* 17: 30-34 (2009).

He LH, Purton DG, Swain MV. A suitable base material for composite resin restorations: zinc oxide eugenol. *Journal of Dentistry* 38: 290-295 (2010).



ALISON RICH

BDS (Otago) MDS Sc PhD (Melb) FRACDS FFOP(RCPA)
Oral Diagnostic and Surgical Sciences
Associate Professor and Associate Dean (Undergraduate Studies)

Associate Professor Rich is a co-leader of the Immunopathology Group. The group has been successful in attracting a number of grants for their work and Associate Professor Rich intends to continue to use her skills as a diagnostic oral pathologist and an experienced research supervisor to advance this group's work. In 2009/10, she co-supervised 4 PhD and 3 DClinDent students as well as assisting with other postgraduate and undergraduate student research projects. An undergraduate student she supervised won the local IADR junior competition and presented her material in Wuhan (China) in 2009. Associate Professor Rich's contribution to dental research was recognised by her being invited in 2010 to become a member of the Board of the New Zealand Dental Association Research Foundation.

Associate Professor Rich's research also relates to her activities as Associate Dean – Undergraduate Studies (Dentistry). She obtained a Research into University Teaching Grant in 2009 to determine whether the performance of dental students in selection tasks predicts their subsequent academic and clinical performance. Alison is part of a national team investigating dental workforce issues in New Zealand, and a member of the Oral Health Workforce Executive. Research into curriculum development and student mentoring, with the Dental Education Support Officer, is an emerging interest.

Research and Collaboration

Investigation of various aspects of potentially malignant oral disorders and oral squamous cell carcinoma is an ongoing project and, during 2009-10, the main area of interest was characterising the nature and role of inflammatory cells in the connective tissue adjacent to islands of invading keratinocytes. Specifically, the type and distribution of tumour-infiltrating lymphocytes and cells expressing toll-like receptor 2 was assessed and their influence on the tumour microenvironment was analysed. A parallel study was also undertaken, investigating the immune infiltrate and the expression of TLR2 in oral mucosal lichen planus.

This work was enhanced by collaboration with the Oral Cancer Research and Coordinating Centre at the University of Malaya (www.malaysiaoralcancer.org).

Recent Publications

Bakri MM, Hussaini HM, Holmes AR, Cannon RD, Rich AM. Revisiting the association between candidal infection and carcinoma, particularly oral squamous cell carcinoma. *Journal of Oral Microbiology* 2: 5780 - DOI: 10.3402/jom.v2i0.5780 (2010).

Rosdy NMMNM, Firth NA, Rich AM. Calibre-persistent labial artery: often misdiagnosed as a mucocoele. *International Journal of Oral and Maxillofacial Surgery* 39: 1230-1233 (2010).

Kaur J, Hay KD, MacDonald H & Rich AM. Retrospective audit of the use of the Marx Protocol for prophylactic hyperbaric oxygen therapy in managing patients requiring dental extractions following radiotherapy to the head and neck. *New Zealand Dental Journal* 105: 47-50 (2009).

Ayers KMS, Thomson WM, Newton JT, Morgaine KC, Rich AM. Self-reported occupational health of general dental practitioners. *Occupational Medicine* 59: 142-148 (2009).



DONALD SCHWASS

BSc (Waik) BDS DClinDent (Otago)
Oral Rehabilitation
Senior Lecturer

Dr Don Schwass's research platform is based predominantly on developing novel treatments for dental caries, and the validation of caries diagnostic devices used to guide treatment decisions. He has a particular interest in exploring the potential of micro-computed tomography (micro-CT) to evaluate demineralisation/remineralisation processes affecting dental hard tissues and to measure the effectiveness of different caries removal techniques.

Current research is directed at developing silver nanoparticles, specifically for treating dentine caries, but with potential for much wider application. As a practising clinician undertaking implant dentistry, he is also interested in the potential of these antimicrobial products for managing peri-implant disease.

Dr Schwass has a special interest in competence-based dental education.

Research and Collaboration

Key collaboration involves ongoing work with Dr Carla Meledandri (Chemistry Department, University of Otago) developing micelle-stabilised silver nanoparticles. Funding by Partnering for Innovation has allowed for the employment of a full-time research assistant, Dr Kerstin Scholz (Chemistry), involved in silver nanoparticle synthesis. Dr Schwass was responsible for developing the initial concepts and continues to direct future prototype modifications towards a broad range of applications. In parallel to establishing efficacious clinical outcomes for silver nanoparticles, new insights in helping to understand the complex chemistry associated with silver nanoparticle entities are anticipated. This work will contribute towards completion of a PhD (part-time) by Dr Schwass.

Dr Schwass is part of a collaboration conducting clinical caries research, involving Dr Lyndie Foster Page, Alison Meldrum, Professor Michael Swain, Professor W. Murray Thomson and DMG (Germany). Specifically, this involves a split-mouth clinical trial to evaluate resin infiltration of non-cavitated proximal carious lesions in teeth using ICON (a low viscosity resin; DMG, Hamburg).

He is also part of a collaboration investigating the effects of clinically adjusting the occlusal surfaces of ceramic materials, involving Dr Chee Chang (Sydney), Professor Michael Swain, and Neil Waddell.

Other collaborations involve various applications for micro-CT; most notably with Carolina Loch Silva (Geology), who is investigating modern and fossilised cetacean dentitions.

He is co-supervisor and clinical tutor for a PhD student (due for completion 2011).

Recent Publications

Schwass DR, Swain MV, Purton DG, Leichter JW. A system of calibrating micro-tomography for use in caries research. *Caries Research* 43: 314-321 (2009).



GREGORY SEYMOUR

AM FRSNZ BDS(Hons) (Syd) MDS (Syd) PhD (Lond)
FRCPath FFOP(RCPA) FRACDS(Perio) FICD FADI
Dean, Faculty of Dentistry
Professor of Periodontology

Over his career, Professor Seymour has had over 320 peer-reviewed published papers with over 6,300 citations and an H-index of 43. His current research has 3 major themes: the relationship between oral disease and systemic conditions primarily atherosclerosis; the immunopathogenesis of periodontal disease using immunopathology and molecular pathology; and the effect of environmental factors such as smoking and the use of bisphosphonates on gingival fibroblast gene expression profiles. In terms of the relationship between periodontal disease and atherosclerosis, Professor Seymour's research has focussed on molecular mimicry as the link between the two diseases and, in this context, he has been invited to write a number of reviews, including a guest editorial in *Future Cardiology*. As well, in 2009, he was invited to present a lecture on "Dental education in the 21st century: where is research leading us?" at the University of Chile (Santiago, Chile) and a lecture on "Multidisciplinary research: A new paradigm for the 21st century" at the University of Antofagasta (Antofagasta, Chile). Professor Seymour was also invited to present a one-day course on "The immunopathogenesis of chronic periodontitis and peri-implantitis" for the Chilean Society for Periodontology in Santiago, Chile. In 2010, he was invited to take part in the European Workshop On Periodontology in Spain.

Professor Seymour is a recognised world expert on the immunology of periodontal disease and was invited to co-edit an issue of the high-ranking journal *Periodontology 2000* on the "Comparative biology of Chronic and Aggressive Periodontitis". He has also co-edited a volume on Oral Biology in the prestigious "Methods in Molecular Biology" series.

Research and Collaboration

Professor Seymour's research continues to be primarily directed at understanding susceptibility to periodontal disease and its relationship to systemic diseases. In this context, a metagenomic approach is being used to carry out large-scale species surveys of the oral microbiota in both health and disease. In addition, the peripheral blood and salivary transcriptomes are being investigated to identify specific gene expression profiles associated with disease progression, while epigenetic approaches are being used to identify how environmental factors (such

as smoking) impact on periodontal disease expression and progression. International collaborative studies with the University of Queensland and Niigata University are continuing to investigate the role of molecular mimicry as the link between periodontal disease and atherosclerosis. As part of this ongoing work, cytokine gene expression profiles of *Porphyromonas gingivalis* GroEL specific T cells are being investigated.

As part of the Molecular and Immunopathology Research Group, focused gene expression arrays and single gene analysis are being used in conjunction with immunohistology to investigate a range of oral diseases, including oral squamous cell carcinoma and oral mucosal disease.

Recent Publications

Sosroseno W, Bird PS, Seymour GJ. Effect of exogenous nitric oxide on murine immune response induced by *Aggregatibacter actinomycetemcomitans* lipopolysaccharide. *Journal of Periodontal Research* 44: 529-536 (2009).

Seymour GJ, Gemmell E, Yamazaki K. T cell responses in periodontitis. In: *Periodontal Medicine and Systems Biology*. Eds; Henderson B, Curtis M, Seymour RA, Donos N. Wiley-Blackwell Publishing Limited, ISBN: 978-1-4051-2219-1, Oxford UK; pp357-376 (2009).

Schätzle M, Faddy MJ, Cullinan MP, Seymour GJ, Lang NP, Bürgin W, Ånerud A, Boysen H, Løe H. The Clinical Course of Chronic Periodontitis V. Predictive factors in periodontal disease. *Journal of Clinical Periodontology* 36: 365-371 (2009).

Bohnsted S, Cullinan MP, Ford PJ, Palmer J, Leishman SJ, Westerman B, Marshall RI, West MJ, Seymour GJ. High antibody levels to *P. gingivalis* in cardiovascular disease. *Journal of Dental Research* 89: 938-942 (2010).



DARA SHEARER

BDS (Cork) MComDent (Otago)
Oral Sciences
Research Fellow

Research and Collaboration

Dara Shearer's research interests include: the epidemiology of intergenerational continuity in oral health; the role of life course events and gene-environment interactions in intergenerational continuity in oral health; and the role of family history in oral health, including dental caries, tooth loss, periodontal disease and oral-health-related quality of life. Both cross-sectional and longitudinal parental-proband associations were investigated using data from the Dunedin Multidisciplinary Health and Development Study (a prospective observational study of a cohort of 1000+ New Zealanders born in Dunedin between April 1972 and March 1973), and data from the Dunedin Family History Study conducted in 2004.

Collaborators include Professor Murray Thomson and Dr Jonathan Broadbent (Department of Oral Sciences), Professor Richie Poulton (Department of Preventive and Social Medicine, and Director, Dunedin Multidisciplinary Health and Development Study), and Professors Terrie Moffitt and Avshalom Caspi (Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, King's College London, and Institute for Genome Sciences and Policy, Duke University, Durham, North Carolina).

Recent Publications

Shearer DM, Thomson WM. Intergenerational continuity in oral health: A review. *Community Dentistry and Oral Epidemiology* 38: 479–86 (2010).



MICHAEL SWAIN

BSc (Hons) PhD (NSW)
Oral Rehabilitation
Professor

Research and Collaboration

2009 and 2010 have been very productive years with considerable collaboration with different groups within the Faculty of Dentistry.

Advanced dental ceramics have (with the advent of computer-aided manufacture) become of high demand and interest to the dental community. However, there has been a problem with the chipping damage they incur. A pioneering paper was published on this topic in 2009; it has been highly cited and been the basis for a radical change in the cooling cycle during processing. Another aspect has been the damage generated by clinicians and technicians during adjustment of porcelain during clinical placement. Another pioneering study on this topic has just been published. There are also a series of papers with members of the Dental Technology group (addressing the thermal gradients and associated residual stresses) that have been submitted on this topic to various journals in the past year.

Another major field has been in the area of dental implants. This work has been a collaboration with Associate Professor Alan Payne and has resulted in a number of publications. This work has addressed the role of various attachment systems on their failure and maintenance. In addition, an extensive investigation of the fit of implants and how to quantify this has been undertaken. Other clinical studies have been concerned with molar incisor hypoplastic teeth and the critical role and nature of the residual proteins present in the enamel. Overseas collaboration has continued with Professor Gerold Schneider in Germany, resulting in a series of high-impact-factor papers investigating hierarchical influences on the mechanical properties of enamel.

Recent Publications

Swain MV. Chipping of veneering porcelain on all-ceramic dental crowns and bridges. *Acta Biomaterialia* 5: 1668–1677 (2009).

Schwass DR, Swain MV, Purton DG, Leichter J. A system of calibrating micro-tomography for use in caries research. *Caries Research* 43: 314–321 (2009).



Ang SF, Bortel EL, Swain MV, Klocke A, Schneider GA. Size dependent elastic/inelastic behaviour of enamel over millimeter and nanometer length scales. *Biomaterials* 31: 1955-1963 (2010).

Farah RA, Monk BC, Swain MV, Drummond B. Protein content of molar-incisor hypomineralisation enamel. *Journal of Dentistry* 38: 591-596 (2010).

ANDREW TAWSE-SMITH

DDS (Colombian Sch of Dent) CertPeriodontology (Goteborg)
Dentistry
Student Affairs Officer and Senior Lecturer

Andrew conducts clinical research involving dental implantology treatment, and is involved in the prospective evaluation of patients rehabilitated with implant-supported mandibular and maxillary overdentures, as well as evaluations of clinical outcomes (success rates), the hard- and soft-tissue interface (peri-implant health) and different treatment loading modalities.

Another aspect of his research involves educational research. With Dr Vivienne Anderson, he is currently evaluating the development of a research-informed bridging programme for international students involved in IMU-University of Otago partnered dental education.

Research and Collaboration

International collaborations include the following.

Institucion Universitaria Colegios de Colombia, Faculty of Dentistry – Colombian School of Dentistry, University of Otago and Amphia Teaching Hospital Breda, Netherlands; evaluating satisfaction and success rates in patients rehabilitated with Implant-supported Removable Partial Dentures (Multicentre study).

Institucion Universitaria Colegios de Colombia, Faculty of Dentistry – Colombian School of Dentistry; evaluating the effect of removable partial dentures and restorative dentistry on the periodontium.

Recent Publications

Chaparro D, López C, Pabón E, Rozo E, Tawse-Smith A. Efectos clinicos de Protésis Parcial Removible sobre el periodonto. *Journal Odontologico Colegial* (4) Diciembre; 25-30 (2009).

Restrepo M, Restrepo E, Tawse-Smith A, Lozano S, Paez S, Molina B. Efectos de la terapia periodontal en los niveles sericos de proteína C-reactiva en pacientes con enfermedad periodontal. *Journal Odontologico Colegial* (3): 15 – 22 (2009).

Payne AGT, Tawse-Smith A, De Silva R., Duncan W. Early and Conventional Loading. Early loading of two implants in the mandible and final restoration with a retentive-anchor-supported RDP. In: *ITI Treatment Guide Vol 4* Wismeijer D Buser D. Bulser U. Quintessence Publishing Group Vol 4: 76-84 (2010).

Ma S, Tawse-Smith A, Thomson WM, Payne AGT. Marginal bone loss with mandibular 2-implant overdentures using different loading protocols and attachment systems: 10-Year outcomes. *International Journal of Prosthodontics* 23: 321–332 (2010).



W MURRAY THOMSON

MA (Leeds) BSc BDS MComDent (Otago) PhD (Adel) FICD FADI

Oral Sciences

Professor

Professor Thomson conducts research in the broad fields of dental epidemiology, dental public health and dental health services research. His work is currently cited more than 300 times a year, and his h index is 23. In 2010, Professor Thomson was awarded an international Distinguished Scientist Award (the H Trendley Dean Award) by the IADR, and received the Sir John Walsh Research Award from the SJWRI. In 2009, he received Australasia's most prestigious IADR award (the Alan Docking medal) for his contribution to oral sciences and research. To date, his published output includes 179 papers in the peer-reviewed international scientific literature (25 in 2009-10). Professor Thomson has received research funding from the US National Institutes of Health (2 grants as PI) and the NZ Health Research Council.

Research and Collaborations

Professor Thomson's research work is in the areas of (1) dental epidemiological research and (2) dental health services research. *Dental epidemiological research* covers the occurrence, determinants and natural history of the common oral conditions. To do this, he employs a number of standard dental epidemiological approaches (most notably the prospective cohort study and the cross-sectional survey) and techniques. *Dental health services research (HSR)* is concerned with how the dental healthcare system works, and the extent to which users are benefitting from it. Since 1996, Professor Thomson has been the dental principal investigator in the renowned Dunedin Multidisciplinary Health and Development Study. In that role, he has the privilege of working with some of the world's finest researchers in human development. It is a rare day indeed that he does not learn something new.

Recent Publications

Mohamed AR, Thomson WM, Mackay TD. An epidemiological comparison of Dean's index and the Developmental Defects of Enamel (DDE) index. *Journal of Public Health Dentistry* 70: 344-347 (2010).

Sussex PV, Thomson WM, Fitzgerald RP. Understanding the "epidemic" of complete tooth loss among older New Zealanders. *Gerodontology* 27: 85-95 (2010).

Thomson WM, Williams SM, Broadbent JM, Poulton R, Locker D. Long-term dental visiting patterns and adult oral health. *Journal of Dental Research* 89: 307-311 (2010).

Thomson WM, Broadbent JM, Poulton R, Locker D. Trajectories of dental anxiety in a birth cohort. *Community Dentistry and Oral Epidemiology* 37: 209-219 (2009).



GEOFFREY TOMPKINS

BSc PhD PGDipSci (Otago)
Oral Sciences
Senior Lecturer

Dr Tompkins qualifications are in microbiology and he has worked in oral/dental bacteriology for the past 29 years (including graduate studies and postdoctoral appointment). He has been involved in a variety of research, including a Marsden Fund-supported project (see NROs 1 and 2). His current interests include the following areas.

Heme/iron acquisition by periodontal anaerobic bacteria. One DCLinDent student was involved in this research during the assessment period, and one PhD student commenced his degree.

Application of molecular microbiology to forensic analysis of bite marks. One PhD student has been involved in this research during the assessment period. A manuscript is currently under review. The project is currently being extended to examine pre-historic human calculus and its value as an anthropological tool.

Evaluation of antimicrobials in an *ex vivo* endodontic infection model. Dr Tompkins has co-supervised two DCLinDent students involved in this research. One manuscript has been accepted and another has been drafted.

Research and Collaboration

Heme acquisition by periodontal bacteria. There are two components to this research. The first is degradation of host hemopexin by *Porphyromonas gingivalis*. This work has involved collaboration with the Oral Health CRC laboratory, Melbourne Dental School, University of Melbourne. The second is identification of high-affinity heme-binding sites expressed by *P. gingivalis*. Prof. Iain Lamont (Dept. Biochemistry, University of Otago) is a co-supervisor for Mr Bikiran Pardessi (PhD), a student involved with this project.

Forensic analysis of bite marks by comparison of oral bacterial DNA profiles. PhD student Darnell Kennedy is co-supervised by Dr Tompkins, Dr Jo-Ann Stanton (Dept. Anatomy and Structural Biology) and Prof. Jules Kieser (Sir John Walsh Research Institute).

Ex vivo modeling of endodontic infections. This project has involved three DCLinDent students under the collaborative supervision of Dr Tompkins and three members of the Dept. of Oral Rehabilitation: Assoc. Prof. Nicholas Chandler, Mrs Tina Hauman and Mr Jonathan Leichter.

Recent Publications

Power DA, Cordiner SJ, Kieser JA, Tompkins GR, Horswell J. PCR-based detection of salivary bacteria as a marker of expired blood. *Science & Justice* (online May 5, 2009).

Tompkins GR. Genotypic comparison of bacterial DNA recovered from bite marks and teeth. In: Dorion R.B.J. (ed) *Bitemark Evidence: a Color Atlas and Text*. 2nd edition. Marcel Dekker, New York. (2010).

Aziz A, Parmar D, MacNaughton A and Tompkins GR. Viability determination in a dentinal tubule infection model by confocal laser scanning microscopy. In *Oral microbiology. Series: Methods in Molecular Microbiology Humana* (2010).



DARRYL TONG

BDS MB ChB (Otago) MSD CertOMS (Wash) FFDRCSI
FDSRCS FACOMS

Oral Diagnostic and Surgical Sciences
Associate Professor

Darryl conducts clinically-based oral and maxillofacial surgery research which includes dentoalveolar surgery, pathology, trauma, dental implantology, systematic reviews and epidemiological studies of clinical aspects of the specialty. Of particular interest, however, is maxillofacial trauma and ballistic injury, especially in theatres of conflict. Associate Professor Tong is currently enrolled in a PhD investigating war injuries of the face and jaws; it has a historical component describing the evolution and development of war surgery of the face and jaws from ancient to modern times (Afghanistan and Iraq), a surgical audit component utilising the unique HP Pickerill Collection at the Hocken Library and case matching with contemporary patients from Afghanistan, and an evidence-based, systematic review component investigating contemporary aspects of war surgery of the face and jaws which would allow non-specialist clinicians in the field to deal with maxillofacial injuries with more confidence using evidence-based guidelines for care.

Research and Collaboration

Key collaborative research efforts conducted within and outside the School of Dentistry include: the development of a facial trauma stabilisation device with Mr Neil Waddell (Dental Technology) and Otago Innovation which has been awarded a provisional US patent and a second-stage PCT filing with further evaluation of commercialization prospects; and collaborative research with Dr Debra Carr (Textiles); Prof Tom Brooking (History) and Prof Ross Beirne (OMS from the University of Washington), all involved with PhD research on war injuries of the face and jaws.

Other research collaborations include: a veterans' health project conducted by Veterans Affairs NZ (VANZ) and conducted (in part) by members of the Dept of Preventive and Social Medicine; implantology research with Dr Warwick Duncan (Perio); and research involving gunshot wounds to skulls with the Forensic Biology Group headed by Prof Jules Kieser.

Recent Publications

Patel KJ, De Silva HL, Tong DC, Love RM. The concordance between clinical and histopathological diagnoses of oral mucosal lesions. *Journal of Oral and Maxillofacial Surgery* doi:10.1016/j.joms.2010.07.075. Epub Oct 22 (2010).

Beaconsall-Ryan K, Tong DC, Love RM. Radiolucent inflammatory jaw lesions – a 20 year analysis. *International Endodontic Journal* 43: 859-865 (2010).

Willis DHR, Tong DC, Thomson WM, Love RM. Maxillofacial trauma and the General Dental Practitioner – specialty recognition and patterns of referral. *New Zealand Dental Journal* 106: 97-102 (2010).

Tong DC, Dawson J, Love RM. Factors affecting oral health status in an elderly military veteran population in New Zealand. *Journal of Military and Veterans' Health* 18: 12-17 (2010).



NEIL WADDELL

MDipTech (DentTech)(TN) PGDipCDTech (Otago) HDE (UN)
Oral Rehabilitation
Senior Lecturer

Neil's research involves craniofacial biomechanics with a special focus on prosthodontic, failure mechanisms and adhesion of dental restorations and materials, and forensics.

Research and Collaboration

Within the Faculty of Dentistry, Mr Waddell is involved with the following research groups: Waddell JN, Payne AGT, Swain MV and Kieser J, Failure of bar attachment systems in implant overdentures; and Kieser J, Swain MV, Farella M and Waddell JN, Intra-oral Pressure Dynamics.

His other national and international collaborations are listed below.

Waddell JN, Selvanesan L, Dias GJ and Swain MV. Collaborative group between the School of Dentistry, the Department of Anatomy and Structural Biology investigating the strength and fracture response of suture repaired rat skin.

Kieser J, Taylor M, Nicholson HD, Swain MV, Walsh K and Waddell JN. Collaborative group between the School of Dentistry, the Department of Anatomy and Structural Biology and the Forensic Science Department of Environmental Science and Research, investigating Sharp and Blunt Force Trauma, Skin/Skull/Brain Wound Ballistics and Blood Spatter.

Kieser J, Bernal V and Waddell JN. Collaborative study on The Uniqueness of the Human Anterior Dentition, a Procrustes Analysis between the School of Dentistry and Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, Argentina.

Kieser J, Pullen AJ, Brondlund J, Foster K, Swain MV, Ichim I and Waddell JN. Collaborative group between School of Dentistry, the Bioengineering Institute – Auckland University; Institute of Food Nutrition and Human Health – Massey University; School of Dentistry/Oral Health Centre of Western Australia – The University of Western Australia, investigating Craniofacial Mastication.

Roehrle O, Sani H, and Waddell JN. Collaborative group between School of Dentistry and the Institute of Applied Mechanics, Stuttgart University, investigating virtual articulation in dental CAD/CAM applications.

Recent Publications

Jorn D, Waddell JN, Swain MV. The influence of opaque application methods on the bond strength and final shade of PFM restorations. *Journal of Dentistry* 38: 143-149 (2010).

Kennedy D, Waddell JN, Swain MV, Kieser J. Tongue pressure patterns during water swallowing. *Dysphagia* 25: 11-19 (2010).

Radford G, Kieser J, Bernal V, Waddell JN, Forrest A. Biomchanical approach to human bitemark reconstruction. *Journal of Forensic Odontostomatology* 27: 33-36 (2009).

Röhrle O, Waddell JN, Foster KD, Saini H, Pullen AJ. Using A Motion Capture System To Record Dynamic Articulation For Application In CAD/CAM Software. *Journal of Prosthodontics* 18: 703-10 (2009).



KIRSTEN WADE

*MPH DipDentHyg DPH (Otago) DipTchg
Oral Sciences
Lecturer*

Ms Wade is currently involved in a number of areas of research. The first is a study to observe and describe the clinical working postures of final year Bachelor of Oral Health (BOH) students, conducted at the Faculty of Dentistry and School of Physiotherapy; and a second is a project to evaluate the effectiveness of delivery of an oral health message for patients with heart disease or diabetes through two local community pharmacies.

A third project aims to describe the oral health beliefs and health-related behaviors of University of Otago Bachelor of Oral Health and Minnesota State University, Mankato Bachelor of Dental Hygiene Students, utilising the Transtheoretical Model of Behavioral Change (TTM) developed by James O. Prochaska and Carlo C. DiClemente in the early 1980s. The TTM proposes that individuals progress through a series or stages of change when intentionally changing behaviors. This study is designed to examine oral health beliefs and oral health-related behaviors of these students at both entry and graduate levels utilizing the constructs of TTM. Pre-education findings will be compared with post-education findings. Finally, University of Otago and Minnesota State University, Mankato students' data will be compared and examined for commonalities and differences during the same educational points in time.

Another project is an investigation into edentulous patients' motivation for replacement of their existing complete dentures, the expectations they have in relation to their new dentures, and why treatment was sought at the Faculty of Dentistry. Finally, Kirsten is involved in a study to determine the effect of attendance at a dental hygiene clinic on oral health behaviour; utilising constructs of the Transtheoretical Model (TTM) of behaviour change.

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| Geoffrey Tompkins | | geoffrey.tompkins@otago.ac.nz | 55 |
| Kirsten Wade | kirsten.wade@otago.ac.nz | 58 | |
| Sir John Walsh Research Institute | Jules Kieser | jules.kieser@otago.ac.nz | 37 |

Research Highlights

IADR Colgate Poster Competition 2009

The New Zealand Section of the International Association for Dental Research (IADR) Colgate Student Poster Competition, held in 2009, produced two winners who went on to compete at the ANZ Divisional meeting held later that year in Wuhan, China. They were:

Philippa Greer – *Expression of Cytokeratins in Odontogenic Tumours*. Supervised by Haizal Hussaini, Ms Lynda Horne, Mr Norman Firth and Associate Professor Alison Rich.

Nurul Haji Ishak – *Revealing the Genomic Secrets of Streptococcus salivarius Strain Mia*. Supervised by Associate Professor Mary Cullinan, Professor John Tagg and Dr Nick Heng.

IADR Colgate Poster Competition 2010

Winners of the 2010 Colgate Student Poster Competition were:

Jessica Po – *Within – and between – individual variability in the natural human chewing pace*. Supervised by Professor Mauro Farella.

Michael Zhao – *Evaluation of an in-vitro wounding model for human gingival fibroblast*. Supervised by Dr Dawn Coates and Professor Gregory Seymour.

In 2010, Division Travel Awards were introduced, funded by the ANZ Division. These were awarded to:

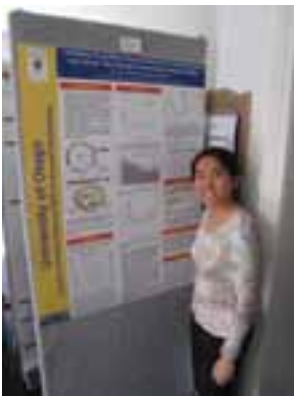
Michelle Kang – *Students' perceptions of educational environment and future professional work*. Supervised by Dr Lyndie Foster Page and Dr Vivienne Anderson.

Grace Lee – *Inhibiting drug efflux pumps relevant to fungal infections and cancer*. Supervised by Dr Kyoko Niimi, Dr Ann Holmes and Dr Mikhail Keniya.

All winners competed at the IADR ANZ Divisional Meeting held in Kiama (New South Wales) from 27-29 September 2010. Grace, a 4th-year BDS student, went on to be awarded the Junior IADR/Unilever Hatton ANZ Division Award.

Grace conducted her research while on a summer studentship under the supervision of Drs Ann Holmes and Kyoko Niimi from the Molecular Microbiology Research Group of the Sir John Walsh Research Institute. The project involved developing a fluorescence-based assay to study the efflux kinetics of specific transporters which contribute to the development of drug resistance in fungal infections and cancer. The optimised assay will be valuable for screening for clinically safe drug efflux pump inhibitors that can be used in combination with existing antifungal agents and cancer drugs to overcome drug resistance.

The Divisional Award provided Ms Lee with a travel grant to present her research in the Hatton Competition at the 89th General Session of the IADR held in San Diego, California in March 2011.



Grace Lee with her winning poster.



Associate Professor Awarded Lottery Health Grant

In 2010, Associate Professor Anita Nolan was awarded a Lottery Health Grant of \$34,000 toward her research into Oral Crohn's Disease.

Crohn's Disease costs New Zealand over \$58 million annually, because this country has the second highest incidence of this disease in the world. The patients' cost is far greater than financial, as this chronic, incurable bowel disorder causes pain, considerable illness and disruption to life. Early, prompt treatment is reported to significantly improve outcome. Mouth lesions termed "Oral Crohn's Disease" often precede intestinal Crohn's Disease. Increasingly, evidence suggests that Oral Crohn's Disease is not only an early sign of future Crohn's Disease, but it may even predict the type and severity of future intestinal inflammation. This research will evaluate the genetic links and benefits of screening for Oral Crohn's Disease. Oral screening is simple and painless, but may revolutionise future management of Crohn's Disease by alerting clinicians to initiate treatment at a much earlier stage of the disease.

Associate Professor Nolan said "This is an exciting research project, which is only possible with the enormous support and expertise of the entire research team. This team includes Dr Rebecca Roberts, Biochemistry, Associate Professors Richard Gearry and Andrew Day and Dr Michael Schultz, Dept. of Medicine, University of Otago and Professor Murray Thomson from the Faculty of Dentistry".

ANZFSS 20th International Symposium: 5-9 September 2010

In September 2010, a contingent of 9 students from the Sir John Walsh Research Institute's forensic group presented their research at the ANZFSS (Australia and New Zealand Forensic Science Society) 20th International Symposium on the Forensic Sciences, held in Sydney, Australia. The group gave 2 oral and 5 poster presentations, which were well placed within a stimulating programme that showcased research and expertise from over 950 delegates across a multitude of disciplines. From both scientific and legal perspectives, the symposium provided much insight into the current issues facing the field of forensic science. In addition, the networking opportunities gained will be of great benefit to both individual students and the forensic group as a whole.

Attendees: Sam White, Sarah Weller, Gemma Dickson, Tanya Dann, Gemma Radford, Jacqui Kao, Darnell Kennedy, Andrea Donaldson, Joy Tahere.





Oral Biology book published in 2010

With the increasingly sophisticated molecular biological tools and techniques developed in recent years, a comprehensive collection of detailed methods directly relating to oral research was needed. Professor Gregory Seymour, Associate Professor Mary Cullinan and Dr Nick Heng from the Molecular Microbiology and Oral Immunopathology Research Groups (Sir John Walsh Research Institute) were commissioned to edit a volume in the well-known Methods in Molecular Biology series entitled "Oral Biology: Molecular Techniques and Applications" featuring an international panel of contributors, all experts in their own respective fields of oral biology.

The book is divided into three parts: (i) saliva studies, (ii) oral microbiology, and (iii) cells and tissues. Each chapter describes a protocol (or a set of associated protocols) in detail and includes a "Notes" section, featuring useful "tips and tricks" related to the technique. In addition, methods to analyse the results (for example, from high-throughput sequencing or DNA microarrays) are also provided. Protocols can also be adapted to the user's specific needs. This volume, thought to be the first in the MiMB series dealing specifically with oral biology, will serve as a valuable resource for molecular biology novices and veterans alike.



Kate Sheppard Memorial Award Recipient for 2010

Dr Sunyoung Ma from the Faculty of Dentistry's Department of Oral Rehabilitation was the 2010 recipient of the Kate Sheppard Memorial Award. Dr Ma is a senior lecturer/specialist prosthodontist who has been involved in the ceramic implant overdenture research project at the Sir John Walsh Research Institute.

As part of the project, Dr Ma will be running a pilot study examining the different loading patterns around implants supporting overdentures, as well as the wear of the attachment systems. The grant from the Kate Sheppard Memorial Award Trust will be put towards the purchase of equipment for the attachment wear analysis.

The Kate Sheppard Memorial Award Trust was set up to establish an annual award to provide an opportunity for a woman to develop her potential by undertaking further education, study, research or training in areas which are of value in the community within New Zealand.



Major support from Marsden Fund for innovative Otago research

University of Otago researchers have received major support from the prestigious Marsden Fund for a wide variety of innovative studies that will push the boundaries of current knowledge.

In the Fund's 2010 round, researchers from across the University's Divisions of Health Sciences, Humanities, and Sciences gained \$10.67M for 19 projects addressing unsolved questions in realms ranging from atomic physics to societal conflict resolution.

Dr Brian Monk was one of the Marsden funding recipients and was awarded \$840,000 over three years for a project titled "Multifunctional azoles: A triple whammy designed to defeat drug resistance". Dr Monk and his research team, which includes Dr Joel Tyndall, Dr Mikhail Keniya and colleagues in Brussels, San Francisco, Wellington and Wiesbaden, are working to develop a novel fungicidal chemotherapy to stop multidrug resistant infections that kill people or adversely affect agricultural productivity.

Marsden grants are administered by the Royal Society of New Zealand and support research excellence in science, technology, engineering and mathematics, social sciences and the humanities.



Otago Professor wins international award for research in dental health

Professor Murray Thomson from the University of Otago's Department of Oral Sciences was the 2010 recipient of a prestigious award from the International Association for Dental Research. The H. Trendley Dean Memorial Award was presented to Professor Thomson at the Association's 88th General Session & Exhibition in Barcelona, Spain.

Before he left for Barcelona, Professor Thomson said he felt extremely honoured to be chosen for the award, and it marked a major milestone in his professional career. As Professor of Dental Epidemiology and Public Health at the University of Otago, he is a prolific researcher. He is known for his contributions in several areas of dentistry, most notably the natural history of oral conditions (and associated disparities) in both young people and older adults.

In a statement announcing the award, the Association said Professor Thomson is regarded as an international expert on the epidemiology of dry mouth and has undertaken important work on the measurement and epidemiology of that condition. "Professor Thomson has made a number of important contributions in this field. These range from the epidemiological validation of quality of life measures (as it relates to oral health) to various aspects of health services research and dental practice," the statement said.

Professor Thomson entered academia in 1994 after five years in general dental practice in New Zealand and England, and seven years in this country's public dental sector. He has been at Otago in his academic and research role since 1996. His research has been funded by a number of agencies, including the US National Institutes of Health, the New Zealand Dental Association, the Health Research Council of New Zealand and the Ministry of Health. To date, Professor Thomson has published 179 research papers in peer-reviewed scientific literature. He is also the Editor of the New Zealand Dental Journal.

The award is in memory of H. Trendley Dean, the 21st President of the IADR and first dental officer of the National Institutes of Health. The award comprises a monetary prize and plaque, and is given for distinguished accomplishments in research and development in the fields of behavioural science, epidemiology, and public health. It is one of the highest honours bestowed by the IADR.

Alan Docking Award for 2009

In 2009, Professor Thomson received the prestigious Alan Docking Award from the Australia-New Zealand division of the IADR. The Docking Award is given for distinguished research in dentistry.



Professor Murray Thomson receiving the IADR Distinguished Scientist Award (the 2010 H Trendley Dean Memorial Award, for meritorious research in epidemiology and public health) at the 2010 General Session of the International Association for Dental Research, Barcelona, July 2010.

Enrolled Postgraduate Students 2009 – 2010

PhD

| Name | Title of Research Project | Primary Department | Supervisors |
|--------------------|---|--|---|
| Nabeel Alsabeeha | Mandibular implant overdentures for older adults. An 'in vivo' and 'in vitro' assessment to develop a novel attachment system | Oral Rehabilitation | Associate Professor A Payne |
| Momen Atieh | Interventions for replacing missing teeth: oral implants in molar extraction sockets (delayed, early and immediate placement) restored with single implant crowns | Oral Rehabilitation | Dr W Duncan Associate Professor M Cullinan Associate Professor R K De Silva Mr D Schwass |
| Marina Mohd Bakri | Acetaldehyde metabolism in candida albicans and its role in oral can | Oral Sciences | Professor R Cannon Dr Ann Holmes Associate Professor A Rich |
| Jonathan Broadbent | Oral health disparities to the fourth decade of life | Oral Sciences | Professor WM Thomson Professor J Kieser Dr K Ayers |
| Andrea Coldea | Suitability of resin-ceramic interpenetrating network composites for CAD/CAM based dental restorative material | Oral Rehabilitation | Professor M Swain Dr Norbert Thiel, Vita Zahnfabrik, Germany Professor J Kieser |
| Gemma Dickson | Marine decomposition and bacterial succession as a forensic indicator of postmortem submersion interval | Department of Biochemistry OSMS | Professor J Kieser Associate Professor R Poulter, Biochemistry Associate Professor K Probert, Marine Science |
| Jennifer Doss | The measurement of health-related quality of life among oral cancer patients in Malaysia | Oral Sciences | Professor WM Thomson Associate Professor B Drummond Professor R Jallaludin, Community Dentistry, University of Malaya |
| Frank Fischer | Inhibition of Candida albicans adherence by immunoglobins | Oral Sciences | Professor R Cannon Dr A Holmes |
| Lyndie Foster Page | Oral health related quality of life (OHRQoL) among adolescents | Oral Sciences | Professor WM Thomson Mr A Quick Professor J Kieser |
| Amanda George | Disease in Prehistoric New Zealand and the Chatham Islands | Department of Anthropology, Gender & Sociology | Professor J Kieser Associate Professor R Walter |

| Name | Title of Research Project | Primary Department | Supervisors |
|-------------------------------------|---|-------------------------------------|---|
| Sujan Yellagunda Ramalinge Gowda | Heterologous expressions of Homo sapiens ABC92 (HsABCG2) in yeast | Oral Sciences | Dr Brian Monk Dr Erwin Lamping Dr Kyoko Niimi |
| Sara Hanning | The development of an oily formulation for xerostomia | School of Pharmacy | Associate Professor N Medicott, Pharmacy Professor T Rades, Pharmacy Professor J Kieser |
| David Healey | Expectations and satisfaction with orthodontic treatment | Oral Sciences | Professor WM Thomson Associate Professor R Gauld |
| Franzi Huschmann | Elucidation of a new anti-cancer drug target | School of Pharmacy | Dr J Tyndall, Pharmacy Professor K Krause, Biochemistry Dr E Lamping |
| Haizal Mohd Hussaini | Immune response in tissue and peripheral blood in oral cancer patients | Oral Diagnostic & Surgical Sciences | Associate Professor A Rich Professor G Seymour Mr N Firth |
| Anil Jalaludin | Biofouling | Department of Chemistry | Professor J McQuillan Dr B Monk Professor P Bremer |
| Jacqui Kao | Raman microscopy of complex biological materials | Department of Chemistry | Professor J Kieser Professor K Gordon, Chemistry Professor M Eccles, Pathology |
| Darnell Kennedy | Microbial DNA analysis of bite marks | Oral Sciences | Dr G Tompkins Dr J Stanton Professor J Kieser |
| Dusan Kuzmanovic | Effect of endodontic access cavities on the structural integrity of all-ceramic crowns | Oral Diagnostic & Surgical Sciences | Professor R Love Professor M Swain |
| Carolina Loch Santos da Silva | Comparative study of modern and fossil cetacean dentitions (Cetacea: Delphinoidea and Platanistoidea) | Department of Geology | Associate Professor E Fordyce Professor J Kieser |
| Karl Lyons | Biofilm formation on prosthetic materials used to restore maxillary resection defects | Oral Rehabilitation | Professor R Cannon Professor R Love |
| Karen Matejka | Biofilm characteristics of <i>Moraxella catarrhalis</i> | Oral Sciences | Dr G Tompkins Professor P Bremer |

| Name | Title of Research Project | Primary Department | Supervisors |
|-------------------|---|-------------------------------------|---|
| Alison Meldrum | Challenging dominant epistemologies: professional education in Dentistry | Higher Education Development Centre | Associate Professor T Harland Professor J Kieser |
| Albert Nguyen | Investigating the Protease Tex31 | School of Pharmacy | Dr J Tyndall, Pharmacy Dr B Monk |
| Reham Osman | Different designs, numbers and distribution of ceramic implants supporting overdentures | Oral Rehabilitation | Dr W Duncan Professor M Swain |
| Praveen Parachuru | Characterisation of CD4, CD25, Fox P3 regulatory T cells and Th17 cells in periodontal disease | Oral Sciences | Professor G Seymour Dr N Heng Associate Professor A Rich |
| Bikiran Pardesi | Identification and characterisation of the high-affinity heme-binding site expressed by Porphyronoma gingivalis | Oral Sciences | Dr G Tompkins Dr N Heng Professor I Lamont, Biochemistry |
| Andrew Quick | The influence of orthodontic and orthognathic therapy on mandibular motion | Oral Sciecnes | Professor J Kieser Dr G Johnson Professor P Herbison |
| Ely Rodrigues | Role of sexual recombination in <i>Candida albicans</i> biology | Oral Sciences | Professor R Cannon |
| Madhu Shankaar | Riboflavin biosynthesis pathway as a antifungal drug target | School of Pharmacy | Dr J Tyndall, Pharmacy Dr B Monk |
| Ajay Sharma | Response of implants coated with peptide sequence orresponding to the cell-binding domains of BMPRI and BMPRII containing sequence DWIVA on osseointegration: A sheep model study | Oral Sciecnes | Dr W Duncan Associate Professor M Cullinan |
| Allauddin Siddiqi | Surgical outcomes of ceramic implants | Oral Rehabilitation | Dr W Duncan Associate Professor R K De Silva |
| Michael Tholey | Interface between Zirconia and veneering porcelain | Oral Rehabilitation | Professor M Swain Professor J Kieser Dr Norbert Theil, Vita Zahnfabrik, Germany |
| Darryl Tong | An evidence-based analysis of maxillofacial war injuries: Aspects of contemporary war surgery | Oral Diagnostic & Surgical Sciences | Professor R Love Professor T Brooking |
| Neil Waddell | Physical and metallurgical assessment of bar-joint and bar-attachment solder joints in implant overdentures: An in-vitro study | Oral Rehabilitation | Professor M Swain Professor J Kieser |

| Name | Title of Research Project | Primary Department | Supervisors |
|---------------------|---|---|--|
| Glenn Wall-Manning | The effects of antimicrobial agents on microcosm dental plaques | Department of Pathology & Molecular Medicine OUW | Associate Professor C Sissons, OUW Dr A Holmes |
| Manjula Weerasekera | Role and dynamics of yeast species in oral biofilms | Department of Pathology & Molecular Medicine OUW | Associate Professor C Sissons, OUW Dr S Anderson, NIWA Dr L Wong, Pathology, OUW Professor B Delahund, Pathology, OUW Professor R Cannon Dr A Holmes |
| Samuel White | Resolution of mitochondrial mixtures | Department of Biochemistry OSMS | Associate Professor R Poulter Professor J Kieser Dr S Cordiner, ESR |
| Sobia Zafar | Effect of bisphosphonates on oral tissues | Oral Sciences | Associate Professor M Cullinan Dr D Coates Associate Professor B Drummond |

DClinDent

| | | | |
|---------------------|--|----------------------|---|
| Rohaida Abdul Halim | Identification of factors in the natal and neonatal period influencing enamel development in permanent first molars and incisors | Paediatric Dentistry | Associate Professor B Drummond Professor WM Thomson |
| Jaffar Abduo | Fit of implant fixed ceramic partial denture frameworks | Prosthodontics | Professor M Swain Dr V Bennani Mr K Lyons Mr N Waddell |
| Luke Adsett | Patterns and trends in facial fractures in New Zealand | Oral Surgery | Professor WM Thomson Professor J Kieser Associate Professor J Broughton |
| Basil Al-Amieh | Assessment of wear at the interface of titanium implants caused by zirconia abutments | Prosthodontics | Professor M Swain Dr V Benanni Mr K Lyons |
| Latfiya Al-Harhi | The impact of periodontal disease on oral health related quality of life among Omani teachers | Periodontology | Professor WM Thomson Mr J Leichter Associate Professor M Cullinan |

| Name | Title of Research Project | Primary Department | Supervisors |
|-------------------|--|---------------------------|--|
| Osama Alothmani | Theory and practice of endodontics measurement and assessment using radiographs | Endodontics | Associate Professor N Chandler Mrs L Friedlander Professor B Monteith |
| Adinar Baharuddin | RANKL, RANK and OPG expression in surgically created periodontal defects in sheep | Periodontology | Dr W Duncan Mr D Holborow Dr T Milne Professor G Seymour |
| Karthika Balaji | Acquisition of oral bacteria in children with Down Syndrome compared with their siblings | Paediatric Dentistry | Associate Professor B Drummond Associate Professor M Cullinan Dr N Heng Mrs A Meldrum |
| Anuj Batra | Microshear bond strength of resin composite to hypomineralised enamel | Paediatric Dentistry | Associate Professor B Drummond Professor J Kieser |
| Eric Chen | Properties of root canal lubricants | Endodontics | Associate Professor N Chandler Associate Professor D Purton Dr G Tompkins |
| Giselle D'Mello | Long-term oral and general health outcomes among children who have required comprehensive dental treatment under general anaesthesia | Paediatric Dentistry | Associate Professor B Drummond Professor WM Thomson Associate Professor M Cullinan |
| Ala Dameh | Root canal preparation with four different rotary systems: comparative study assessed by micro-computed tomography | Endodontics | Professor R Love Professor M Swain |
| Guy Farland | Aspects of intra-oral pressure changes during swallowing | Orthodontics | Professor J Kieser Professor M Farella |
| Rami Farah | The origin of proteins in molar-incisor hypomineralisation enamel | Paediatric Dentistry | Associate Professor B Drummond Dr B Monk Professor M Swain |
| Samuel Goldsmith | Influence of pedicle flap design on healing and postoperative sequelae after lower third molar tooth removal | Oral Surgery | Professor R Love Associate Professor D Tong Associate Professor R K De Silva |

| Name | Title of Research Project | Primary Department | Supervisors |
|---------------------------|---|-------------------------|---|
| Siti Hamzah | Oral health care of people with special needs in Malaysia – A situational analysis and the development of special needs dentistry service | Special Needs Dentistry | Professor R Love Ms E MacFadyen |
| Noren Hasmun | The impact of environmental tobacco smoke on preschool-aged child oral health | Paediatric Dentistry | Associate Professor B Drummond Associate Professor M Cullinan Dr N Heng Professor G Seymour |
| Faizal Hidayat | Use of salivary transcriptomes to identify patients susceptible to periodontal diseases | Periodontology | Mr D Holborow Mr J Leichter Associate Professor M Cullinan Dr N Heng Professor G Seymour |
| Leanne Xiao Li Hou | Does saliva from dry mouth patients promote greater <i>Candida albicans</i> adhesion than saliva from healthy individuals? | Prosthodontics | Professor R Cannon Dr A Holmes Mr K Lyons |
| Hannah Jack | Aspects of labial and lingual pressure during oral function | Orthodontics | Professor M Farella Professor J Kieser |
| Andrea Kelsen | Could we be doing more to look after the oral health of our institutionalized older people? | Special Needs Dentistry | Professor R Love Professor WM Thomson Ms E MacFadyen |
| Yeon Ju (Anna) Kim | The resected root end: is what you see what you get? A naked eye, optical and scanning electron microscope study | Endodontics | Associate Professor N Chandler Mrs L Friedlander |
| Ryan Kim | Wnt expression during early osseointegration of titanium dental implants | Periodontology | Dr W Duncan Dr D Coates Dr T Milne Dr A Tawse-Smith Mr J Leichter Associate Professor A Rich |
| Ching-Yee (Constance) Law | Assessing the zirconia implant-framework system under static and functional loading | Prosthodontics | Professor M Swain Dr V Bennani Mr K Lyons |
| Emily Lam | Remineralization of decalcified tooth enamel consequent to orthodontic treatment | Orthodontics | Mr A Quick Professor J Kieser Professor M Swain Miss W Harding |

| Name | Title of Research Project | Primary Department | Supervisors |
|--------------------|--|-------------------------|--|
| Amy Lee | In vitro investigation on wear mechanisms of different restorative materials on enamel antagonists | Prosthodontics | Professor M Swain Mr K Lyons Dr C He |
| Kimmy Lin | Immunohistochemical localization of TLR2, TLR4 and RANK/RANKL /OPG system in inflammatory root resorption | Endodontics | Professor R Love Mrs L Friedlander Associate Professor A Rich Professor G Seymour |
| Guo Yean Ling | Oral Health of older people admitted to hospital for assessment | Special Needs Dentistry | Professor R Love Ms E MacFadyen Professor WM Thomson |
| Reza Shah Mansouri | Effect of tooth whitening on tooth structure | Prosthodontics | Professor M Swain Dr C He Mr K Lyons Associate Professor D Purton |
| Cameron McNee | EMG neck muscle activity and operator ergonomics in orthodontics | Orthodontics | Professor M Farella Professor J Kieser |
| Erni Noor | Gro EL and heat shock protein 60 specific T-cells in atherosclerosis and chronic periodontitis | Periodontology | Professor G Seymour Associate M Cullinan |
| Edward Ohlrich | The effect of bisphosphonates on angiogenic gene expression by gingival fibroblasts | Periodontology | Dr W Duncan Associate Professor M Cullinan Dr T Milne Dr N Heng |
| Chae Park | Investigation of the relationship between bone density and mechanical properties of peri-implant bone | Prosthodontics | Professor M Swain Dr W Duncan Associate Professor D Purton |
| Joseph Petelo | Aspects of growth and development in New Zealand Polynesian children | Orthodontics | Professor J Kieser Miss W Harding Dr H Buckley |
| Rohan Rodricks | The influence of Haem and superoxide dismutase on the sensitivities of P.gingivalis and P.intermedia | Periodontology | Dr G Tompkins Mr J Boyens Dr N Heng |
| Benedict Seo | Endoplasmic reticulum stress, inflammation and periodontal disease: The unfolded protein response pathways leading to the activation of nuclear factor Keppa B (CNFKB) | Oral Pathology | Associate Professor A Rich |

| Name | Title of Research Project | Primary Department | Supervisors |
|---------------------|--|---------------------------|---|
| Amna Siddiqui | Dentine tubule infection, detection and distribution in root canals | Endodontics | Dr G Tompkins Dr W Duncan Associate Professor N Chandler Mrs T Hauman |
| Suraya Sinon | Expression of toll-like receptor 2 in oral mucosal lichen planus using immunohistochemistry and quantitative real-time reverse transcriptase polymerase chain reaction | Oral Pathology | Associate Professor A Rich Mr N Firth |
| Michael Smith | A comparison of Bio Oss® and Moa Bone® xenografts for maxillofacial bone grafting in the sheep animal model | Periodontology | Dr W Duncan Associate Professor A Rich |
| Jayaram Subramanian | Student and graduate perceptions of the DCLinDent programme: a qualitative research project | Periodontology | Professor T Kardos Dr V Anderson |
| Praema Suppiah | Prevalence of Periodontitis and Oral Characteristics in Ankylosing spondylitis Patients | Periodontology | Associate Professor M Cullinan Associate Professor A Nolan Dr S Stebbings Professor WM Thomson |
| Langley Tasmania | Contact guidance and bacterial invasion of dentinal tubules | Endodontics | Professor R Love Professor R Cannon |
| Kimberley Timmins | Aspects of cervical growth and dental development in New Zealand children | Orthodontics | Professor J Kieser Professor WM Thomson Mr A Quick |
| Ali Ukra | Impact of care-seeking behaviours on temporomandibular disorders and psychological traits in orthodontic patients | Orthodontics | Professor M Farella Professor WM Thomson Dr L Foster Page Professor B Knight |
| Varayini Yoganathan | Antimicrobial peptides and their in-vitro effects against endodontic pathogens | Endodontics | Professor R Love Dr B Monk |

MDS/GPD, MDS/MBChB, PGDipClinDent

| Name | Degree/Diploma | Primary Department |
|----------------------|----------------|-------------------------------------|
| Hamish Cameron | MDS/MBChB | Oral Diagnostic & Surgical Sciences |
| Duncan Campbell | MDS/MBChB | Oral Diagnostic & Surgical Sciences |
| Han Choi | MDS/MBChB | Oral Diagnostic & Surgical Sciences |
| Rhonda Gooding | PGDipClinDent | Oral Diagnostic & Surgical Sciences |
| Sina Ioapo | PGDipClinDent | Oral Diagnostic & Surgical Sciences |
| Rakesh Jattan | MDS/MBChB | Oral Diagnostic & Surgical Sciences |
| Chin-Hwa Liu | PGDipClinDent | Oral Sciences |
| Ovini Masi | MDS | Oral Diagnostic & Surgical Sciences |
| Colleen Murray | PGDipClinDent | Oral Sciences |
| Elizabeth Naysmith | PGDipClinDent | Oral Sciences |
| Rana Othman | PGDipClinDent | Oral Diagnostic & Surgical Sciences |
| Prakash Hasvin Patel | MDS/MBChB | Oral Diagnostic & Surgical Sciences |
| Justus Penaar | MDS/MBChB | Oral Diagnostic & Surgical Sciences |
| Poonam Verma | MDS | Oral Diagnostic & Surgical Sciences |

MComDent, PGDipComDent

| Name | Degree/Diploma | Primary Department |
|---------------------|----------------|--------------------|
| Danny Areai | PGDipComDent | Oral Sciences |
| Angela Benn | MComDent | Oral Sciences |
| Kathryn Fuge | MComDent | Oral Sciences |
| Elizabeth Hitchings | MComDent | Oral Sciences |
| Victoria McKelvey | MComDent | Oral Sciences |
| Tule Misa | MComDent | Oral Sciences |
| Haji Haji Mohamed | MComDent | Oral Sciences |
| David Marshall | PGDipComDent | Oral Sciences |
| Dara Shearer | MComDent | Oral Sciences |



Students in the new Simulation Clinic, First Floor, School of Dentistry.

MDentTech, PGDipCDTech, PGDipDentTech

| Name | Degree/Diploma | Primary Department |
|-------------------------|-----------------------|---------------------------|
| Charlotte Adams | PGDipCDTech | Oral Rehabilitation |
| Marc Adams | PGDipCDTech | Oral Rehabilitation |
| Mohammad Al-Shakarchi | PGDipCDTech | Oral Rehabilitation |
| Khatera Aman | PGDipCDTech | Oral Rehabilitation |
| Steve An | PGDipCDTech | Oral Rehabilitation |
| Livius Andrezza | PGDipCDTech | Oral Rehabilitation |
| Vadym Bataykin | PGDipCDTech | Oral Rehabilitation |
| Chia-Yuan (James) Chang | PGDipDentTech | Oral Rehabilitation |
| Yi-Hsiang (Jimmy) Chiu | PGDipDentTech | Oral Rehabilitation |
| Young Jin Choi | PGDipCDTech | Oral Rehabilitation |
| Shareen ElShiyab | MDentTech | Oral Rehabilitation |
| Yanyan Geng | PGDipCDTech | Oral Rehabilitation |
| Weiwei Hao | PGDipCDTech | Oral Rehabilitation |
| Sae Hoon Jeon | PGDipCDTech | Oral Rehabilitation |
| Min Seh Kim | PGDipCDTech | Oral Rehabilitation |
| Leslie Lamb | PGDipCDTech | Oral Rehabilitation |
| Yu Ri Lee | PGDipCDTech | Oral Rehabilitation |
| Jyana Luba | PGDipCDTech | Oral Rehabilitation |
| Simon Ma | PGDipCDTech | Oral Rehabilitation |
| Claire Macbeth | PGDipCDTech | Oral Rehabilitation |
| Gareth McMurdo | PGDipCDTech | Oral Rehabilitation |
| Susan Merrick | PGDipCDTech | Oral Rehabilitation |
| Emma Mitchell | PGDipCDTech | Oral Rehabilitation |
| Anna Morris | PGDipCDTech | Oral Rehabilitation |
| John Morris | PGDipCDTech | Oral Rehabilitation |
| Mustafa Laith Mustafa | PGDipDentTech | Oral Rehabilitation |
| Ghulum Nawrozi | PGDipCDTech | Oral Rehabilitation |
| Tristan Pattinson | PGDipCDTech | Oral Rehabilitation |
| Pagiranam Prajumas | PGDipCDTech | Oral Rehabilitation |
| Sivalingam Reddy | PGDipCDTech | Oral Rehabilitation |
| Reza Shamini | MDentTech | Oral Rehabilitation |
| Reza Shamiri | MDentTech | Oral Rehabilitation |
| Greg Siggelkow | PGDipDentTech | Oral Rehabilitation |
| Danniel Squire | PGDipCDTech | Oral Rehabilitation |
| Michael Tapealava | PGDipCDTech | Oral Rehabilitation |
| Boris Tinone | PGDipCDTech | Oral Rehabilitation |
| Yuan Wang | PGDipCDTech | Oral Rehabilitation |
| Ronald Winter | PGDipCDTech | Oral Rehabilitation |
| Suzhen Yang | PGDipCDTech | Oral Rehabilitation |
| Wayne Young | PGDipCDTech | Oral Rehabilitation |
| Jiuhu Xiao | PGDipCDTech | Oral Rehabilitation |
| Wenchao Zhou | PGDipCDTech | Oral Rehabilitation |

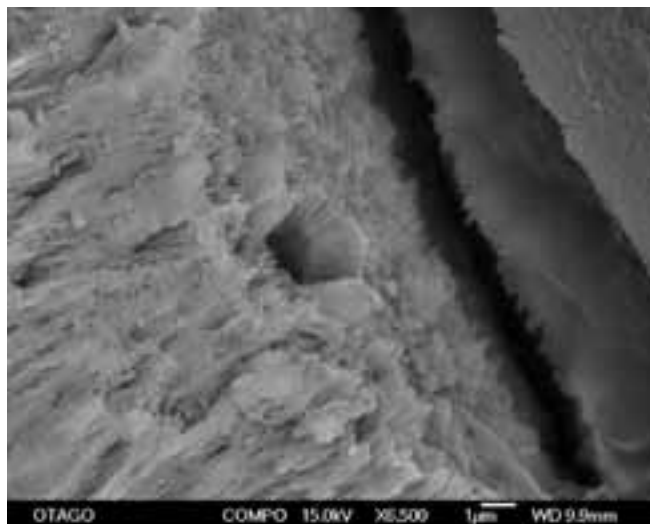
Visiting Research Fellows

2009

| PERIOD OF VISIT | NAME | HOME UNIVERSITY | RESEARCH/SPECIAL INTEREST |
|---------------------------------------|---|--|---------------------------|
| January – February 2009 | Dr L Crocombe (Postgraduate Visiting Fellow) | University of Adelaide, Australia | Dental Epidemiology |
| 10 September 2009 – September 2010 | Dr N Manzoor | Jamia M Islamia, New Dehli, India | Molecular Genetics |

2010

| PERIOD OF VISIT | NAME | HOME UNIVERSITY | RESEARCH/SPECIAL INTEREST |
|------------------------------------|--|---|---|
| January – March 2010 | Mrs L Davidson (Postgraduate Visiting Fellow) | University of Sheffield, United Kingdom | Paediatric Dentistry |
| 2 February – 6 March 2010 | Professor A Lussi | University of Berne, Switzerland | Restorative and Paediatric Dentistry |
| 2 February – 26 March 2010 | Professor R Seymour | University of Newcastle, United Kingdom | Oral Pathology |
| 6 March – 27 March 2010 | Profesor G Schneider | University of Hamburg, Germany | Biomaterials |
| 28 March – 3 April 2010 | Mr Francis Smith | University of California, United States of America | Orthopaedic Surgery |
| 30 March – 2 April 2010 | Associate Professor Rangsini Mahanonda | University of Bangkok, Thailand | Periodontology |
| 13 September – 10 December 2010 | Professor A Ferreira-Pereira (Postgraduate Visiting Fellow) | University of Rio de Janeiro, Brazil | Antifungal drug discovery |



Enamel crystals
under SEM.

Research Funding 2009 – 2010

| Start Date | Project Title | Principal Investigator | Funder | Total \$ (excl GST) |
|------------|---|--------------------------------|---|---------------------|
| 2009 | Microbial analysis of dental plaque samples in the Dunedin Multidisciplinary Health & Development study (DMHDS) | Professor M Thomson | Otago Medical Research Foundation | \$15,185 |
| 2009 | Oral health to age 38 | Professor M Thomson | Health Research Council of NZ (HRC) | \$1,005,527 |
| 2009 | DNA, RNA and protein analysis for dentistry | Professor R Cannon | New Zealand Dental Association | \$4,018 |
| 2009 | Immunohistochemical localisation of TLR2, TLR4 and the RANK/RANKL/OPG in inflammatory root resorption | Professor R Love | New Zealand Dental Association Research Foundation | \$12,817 |
| 2009 | Intergenerational continuity in oral health | Professor M Thomson | National Institutes of Health (USA) | \$261,911 |
| 2009 | Targeting melanoma chemotherapy resistance: developing a drug efflux inhibitor | Professor R Cannon | Health Research Council of NZ (HRC) | \$333,621 |
| 2009 | Oral Health of Older People Admitted to Hospital for Assessment | Professor R Love | New Zealand Dental Association Research Foundation & Ministry of Health | \$7,250 |
| 2009 | Acquisition of periodontopathic bacteria in children with Down syndrome | Associate Professor B Drummond | New Zealand Dental Association & Ministry of Health | \$11,132 |
| 2009 | Characterisation of natural regulatory T Cells and Th17 cells in human periodontal disease | Professor G Seymour | New Zealand Dental Association Research Foundation | \$14,407 |
| 2009 | Mode of action of the fungicidal Pma1p inhibitor BM2 | Dr B Monk | New Zealand Dental Association | \$4,709 |
| 2009 | Wnt expression during early osseointegration of titanium dental implants | Dr W Duncan | New Zealand Dental Association | \$14,970 |
| 2009 | Endoplasmic stress, inflammation and periodontal disease: Unfolded protein response pathways leading to the expression of nuclear factor KB | Associate Professor A Rich | New Zealand Dental Association | \$14,810 |
| 2009 | Identification of broad-spectrum antifungal efflux pump inhibitors | Professor R Cannon | National Institutes of Health (USA) | \$38,542 |
| 2009 | Closing the gaps – Completing the genome sequences of two oral streptococcus salivarius strains | Dr N Heng | New Zealand Dental Association | \$14,457 |
| 2010 | Improving the oral health of preschoolers – implementation of a tool for oral health professionals | A Meldrum | New Zealand Dental Association & Ministry of Health | \$20,971 |

| Start Date | Project Title | Principal Investigator | Funder | Total \$ (excl GST) |
|------------|--|--------------------------------|---|---------------------|
| 2010 | Oral Health Care Protocols and Practices in NZ Rest Homes and Long-Term Care Facilities | Professor R Love | New Zealand Dental Association & Ministry of Health | \$5,773 |
| 2010 | Validating essential enzymes as targets for new broad spectrum antifungal compounds | Dr J Tyndall | Maurice and Phyllis Paykel Trust | \$12,000 |
| 2010 | Trends of facial fractures in New Zealand | Professor M Thomson | Health Research Council of NZ (HRC) | \$110,454 |
| 2010 | Assessing the zirconia implant-framework system under static and functional loading – Fuller Scholarship | Professor M Swain | Fuller Award (Downie Stewart) | \$5,000 |
| 2010 | Wear at the interface of titanium implants by zirconia abutments. Fuller Scholarship. Student: Basil Al-Amleh | Professor M Swain | Fuller Award (Downie Stewart) | \$5,000 |
| 2010 | Root canal preparation with four different rotary systems: comparative study assessed by micro-computed tomography. Fuller Scholarship. Student: Ala Al-Dameh | Professor R Love | Fuller Award (Downie Stewart) | \$3,500 |
| 2010 | Aspects of intra-oral pressure changes during swallowing. Fuller Scholarship. Student: Michael Guy Farland | Professor J Kieser | Fuller Award (Downie Stewart) | \$5,000 |
| 2010 | Aspects of growth and development in NZ Polynesian children. Fuller Scholarship. Student: Joseph Petelo | Professor J Kieser | Fuller Award (Downie Stewart) | \$3,000 |
| 2010 | A comparison of BioOss and Moa Bone xenografts for maxillofacial bone grafting in the sheep animal model. Fuller Scholarship. Student: Michael Smith | Dr W Duncan | Fuller Award (Downie Stewart) | \$5,000 |
| 2010 | The influence of haem and superoxide dismutase on the resistance of Porphyromonas gingivalis and Prevotella intermedia to reactive oxygen species. Fuller Scholarship. Student: Rohan Rodricks | Dr G Tompkins | Fuller Award (Downie Stewart) | \$5,000 |
| 2010 | Long term oral and general health outcomes among children who have required comprehensive dental treatment under general anaesthesia. Fuller Scholarship. Student: Giselle D'Mello | Associate Professor B Drummond | Fuller Award (Downie Stewart) | \$4,744 |
| 2010 | Impact of Bisphosphonates on Gene Expression in Human Gingival Fibroblasts | Dr T Milne | Maurice and Phyllis Paykel Trust | \$5,000 |

| Start Date | Project Title | Principal Investigator | Funder | Total \$ (excl GST) |
|------------|--|---------------------------------|--|---------------------|
| 2010 | Immune escape mechanisms in oral cancer and lymph node metastases and their potential benefit in predicting clinical outcome | H Hussaini | Otago Medical Research Foundation | \$12,444 |
| 2010 | 15th International Congress on Oral Pathology and Medicine | Associate Professor A Rich | Maurice and Phyllis Paykel Trust | \$1,000 |
| 2010 | Disease Burden and Health Inequalities arising from Chronic Dental Disease in Indigenous Children | Associate Professor J Broughton | Health Research Council of NZ (HRC) | \$2,347,828 |
| 2010 | Can the pain and cost of Crohn's Disease be reduced by examining the mouth? | Associate Professor A Nolan | Otago Medical Research Foundation | \$7,900 |
| 2010 | New azoles for emerging fungal pathogens | Dr J Tyndall | Otago Medical Research Foundation | \$10,600 |
| 2010 | Immune escape mechanisms in oral cancer and and lymph node metastases and their relationship to clinical outcome | Associate Professor A Rich | New Zealand Dental Association Research Foundation | \$12,274 |
| 2010 | Cytokine profile of natural regulatory T Cells and Th17 cells in human periodontal disease | Professor G Seymour | New Zealand Dental Association Research Foundation | \$10,224 |
| 2010 | Tissue culture incubator for dental research | Professor R Cannon | New Zealand Dental Association Research Foundation | \$14,980 |
| 2010 | Treatment of dry mouth with microemulsions | Professor J Kieser | New Zealand Dental Association Research Foundation | \$14,956 |
| 2010 | How should oral Crohn's disease screening be undertaken? | Associate Professor A Nolan | New Zealand Dental Association Research Foundation | \$20,035 |
| 2010 | Effect of sodium hypochlorite and casein phosphopeptide-amorphous calcium phosphate on hypomineralised enamel in Molar Incisor Hypomineralisation (MIH). | Associate Professor B Drummond | New Zealand Dental Association Research Foundation | \$4,704 |
| 2010 | Verifying the role of ECM33 in Candida albicans adherence | Professor R Cannon | Tokyo Institute of Technology | \$3,000 |
| 2010 | Preliminary investigation of the aetiology of Molar-Incisor Hypomineralisation | Dr R Farah | New Zealand Dental Association Research Foundation | \$9,029 |
| 2010 | Oral implants in molar extraction sockets: microbiological aspects | Associate Professor M Cullinan | New Zealand Dental Association Research Foundation | \$11,227 |

| Start Date | Project Title | Principal Investigator | Funder | Total \$ (excl GST) |
|------------|---|--------------------------------|--|---------------------|
| 2010 | An investigation of the views of parents and schools on the current and proposed systems of dental care for children in New Zealand | Associate Professor B Drummond | New Zealand Dental Association Research Foundation | \$8,639 |
| 2010 | The oral health of individuals with haemophilia: a mixed methods investigation | Professor M Thomson | New Zealand Dental Association Research Foundation | \$5,615 |
| 2010 | Ceramic implants supporting overdentures | Dr S Ma | Kate Sheppard Memorial Award Trust | \$2,500 |
| 2010 | Overcoming drench resistance | Dr K Niimi | Ministry of Science and Innovation | \$923,393 |
| 2010 | The topographical and functional relationship of coronal and apical dental pulp cells | L Friedlander | New Zealand Dental Association Research Foundation | \$14,867 |
| 2010 | Prevalence of periodontitis and oral characteristics in ankylosing spondylitis patients | Associate Professor M Cullinan | New Zealand Dental Association Research Foundation | \$4,165 |
| 2010 | Dental implants placed in the jaw of a new ovine animal model: a histological analysis of zirconium ceramic implants versus titanium implants | Dr W Duncan | Maurice and Phyllis Paykel Trust | \$12,500 |
| 2011* | Multifunctional azoles: A triple whammy designed to defeat drug resistance | Dr B Monk | Royal Society of New Zealand | \$730,435 |
| 2011* | Does saliva from dry mouth patients promote greater <i>Candida albicans</i> adhesion than saliva from healthy individuals | Professor R Cannon | Fuller Award (Downie Stewart) | \$3,000 |
| 2011* | Contact guidance in <i>E. faecalis</i> , <i>S. mutans</i> and <i>S. gordonii</i> on micro-grooved methylmethacrylate discs | Professor R Love | Fuller Award (Downie Stewart) | \$3,000 |
| 2011* | EMG neck muscle activity and operator ergonomics in orthodontics | Professor M Farella | Fuller Award (Downie Stewart) | \$3,000 |
| 2011* | The impact of periodontal disease on oral-health-related quality of life among Omani teachers | Professor M Thomson | Fuller Award (Downie Stewart) | \$3,000 |
| 2011* | Aspects of labial and lingual pressure during oral function | Professor J Kieser | Fuller Award (Downie Stewart) | \$3,000 |
| 2011* | The resected root end: is what you see what you get? A naked eye, optical and scanning electron microscope study. | L Friedlander | Fuller Award (Downie Stewart) | \$1,000 |
| 2011* | Identification of factors in the natal and neonatal period influencing enamel development in the permanent first molars and incisors | Associate Professor B Drummond | Fuller Award (Downie Stewart) | \$3,000 |

*Awarded in 2010

Faculty Publications

The following publications are audited and supplied by the Publications/Outputs Office, University of Otago, whose formatting is used throughout this section. Publications are listed by Department.

2009 PUBLICATIONS

DENTISTRY (DEAN'S DEPARTMENT)

Chapter in Book - Research

- Kieser, J. A., Tkatchenko, T., Dean, M. C., Jones, M. E. H., Duncan, W., & Nelson, N. J. (2009). Microstructure of dental hard tissues and bone in the tuatara dentary, *Sphenodon punctatus* (Diapsida: Lepidosauria: Rhynchocephalia). In T. Koppe, G. Meyer, & K. W. Alt (Eds.), *Comparative dental morphology: Frontiers of Oral Biology (Vol. 13)* (pp. 80-85). Basel, Switzerland: Karger. doi: 10.1159/000242396
- Seymour, G. J., Gemmell, E., & Yamazaki, K. (2009). T-cell responses in periodontitis. In B. Henderson, M. Curtis, R. Seymour, & N. Donos (Eds.), *Periodontal medicine and systems biology* (pp. 357-378). Oxford, UK: Wiley-Blackwell.

Journal - Research Article

- Atieh, M. A. H., Payne, A. G. T., & Duncan, W. J. (2009). Immediate loading with single implant crowns: A systematic review and meta-analysis. *International Journal of Prosthodontics*, 22(4), 378-387.
- Atieh, M. A., Payne, A. G. T., Duncan, W. J., & Cullinan, M. P. (2009). Immediate restoration/loading of immediately placed single implants: Is it an effective bimodal approach? *Clinical Oral Implants Research*, 20(7), 645-659. doi: 10.1111/j.1600-0501.2009.01725.x
- Blinkhorn, A., Bartold, P. M., Cullinan, M. P., Madden, T., Marshall, R. I., Raphael, S. L., & Seymour, G. J. (2009). Is there a role for triclosan/copolymer toothpaste in the management of periodontal disease? *British Dental Journal*, 207(3), 117-125. doi: 10.1038/sj.bdj.2009.669
- Creeper, F., Lichanska, A. M., Marshall, R. I., Seymour, G. J., & Ivanovski, S. (2009). The effect of platelet-rich plasma on osteoblast and periodontal ligament cell migration, proliferation and differentiation. *Journal of Periodontal Research*, 44(2), 258-265. doi: 10.1111/j.1600-0765.2008.01125.x
- Cullinan, M. P., Ford, P. J., & Seymour, G. J. (2009). Periodontal disease and systemic health: Current status. *Australian Dental Journal*, 54(Suppl. 1), S62-S69. doi: 10.1111/j.1834-7819.2009.01144.x
- Fairhall, T. J., Thomson, M. W., Kieser, J. A., Broughton, J. R., Cullinan, M. P., & Seymour, G. J. (2009). Home or away? Differences between home- and clinic-based dental examinations for older people. *Gerodontology*, 26(3), 179-186. doi: 10.1111/j.1741-2358.2008.00263.x
- Gomes-Filho, I. S., Santos, C. M. L., Cruz, S. S., ..., Seymour, G. J., de ST Santos, C. A., & Barreto, M. L. (2009). Periodontitis and nosocomial lower respiratory tract infection: Preliminary findings. *Journal of Clinical Periodontology*, 36(5), 380-387. doi: 10.1111/j.1600-051X.2009.01387.x
- Kieser, J. A., Dall'Alba, G., & Livingstone, V. (2009). Impact of curriculum on understanding of professional practice: A longitudinal study of students commencing dental education. *Advances in Health Sciences Education*, 14(3), 303-314. doi: 10.1007/s10459-008-9114-6
- Milne, T. J., Ichim, I., Patel, B., McNaughton, A., & Meikle, M. C. (2009). Induction of osteopenia during experimental tooth movement in the rat: Alveolar bone remodelling and the mechanostat theory. *European Journal of Orthodontics*, 31(3), 221-231. doi: 10.1093/ejo/cjp032
- Ohlrich, E. J., Cullinan, M. P., & Seymour, G. J. (2009). The immunopathogenesis of periodontal disease. *Australian Dental Journal*, 54(Suppl. 1), S2-S10. doi: 10.1111/j.1834-7819.2009.01139.x
- Radford, G., Kieser, J., Bernal, V., Waddell, J. N., & Forrest, A. (2009). Biomechanical approach to human bitemark reconstruction. *Journal of Forensic Odonto-Stomatology*, 27(1), 33-36.
- Schätzle, M., Faddy, M. J., Cullinan, M. P., Seymour, G. J., Lang, N. P., Bürgin, W., Ånerud, Å., Boysen, H., & Löe, H. (2009). The clinical course of chronic periodontitis: V. Predictive factors in periodontal disease. *Journal of Clinical Periodontology*, 36(5), 365-371. doi: 10.1111/j.1600-051X.2009.01391.x
- Sosroseno, W., Bird, P. S., & Seymour, G. J. (2009). Effect of exogenous nitric oxide on murine immune response induced by *Aggregatibacter actinomycetemcomitans* lipopolysaccharide. *Journal of Periodontal Research*, 44(4), 529-536. doi: 10.1111/j.1600-0765.2008.01157.x

Sosroseno, W., Bird, P. S., & Seymour, G. J. (2009). Effect of exogenous nitric oxide on murine splenic immune response induced by *Aggregatibacter actinomycetemcomitans* lipopolysaccharide. *Anaerobe*, 15(3), 95-98.

Sosroseno, W., Bird, P. S., & Seymour, G. J. (2009). Nitric oxide production by a human osteoblast cell line stimulated with *Aggregatibacter actinomycetemcomitans* lipopolysaccharide. *Oral Microbiology and Immunology*, 24(1), 50-55. doi: 10.1111/j.1399-302X.2008.00475.x

Journal - Research Other

Seymour, G. J., Ford, P. J., Cullinan, M. P., Leishman, S., West, M. J., & Yamazaki, K. (2009). Infection or inflammation: The link between periodontal and cardiovascular diseases [Editorial]. *Future Cardiology*, 5(1), 5-9. doi: 10.2217/14796678.5.1.5

Siddiqi, A., Payne, A. G. T., & Zafar, S. (2009). Bisphosphonate-induced osteonecrosis of the jaw: A medical enigma? *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics*, 108(3), e1-e8. doi: 10.1016/j.tripleo.2009.04.027

Journal - Professional & Other Non-Research Articles

Kieser, J. A. (2009). Editorial. *Journal of Forensic Odonto-Stomatology*, 27(1). Retrieved from <http://www.odont.uio.no/foreninger/iofos/JFOS/Jun09/EditorialJun09.pdf>

Conference Contribution - Published proceedings: Abstract

Anderson, V. (2009). 'World-travelling': A framework for understanding students' shifts between countries and classrooms? *Proceedings of the Tertiary Education Research in New Zealand Conference*. Retrieved from <http://www.herdsa.org.nz/file.php/5/Anderson.htm>

Aziz, A., Hauman, C. H. J., Tompkins, G. R., & Chandler, N. P. (2009). Infection at the root apex: A confocal microscope study of bacterial viability. *International Endodontic Journal*, 42(12), (pp. 1150). doi: 10.1111/j.1365-2591.2009.01618.x

Cullinan, M. P., Hamlet, S. M., Ford, P. J., & Seymour, G. J. (2009). The distribution of periodontal pathogens in a cardiovascular population. *Proceedings of the International Association for Dental Research (IADR)/American Association for Dental Research (AADR)/Canadian Association for Dental Research (CADR) 87th General Session and Exhibition*. Retrieved from <http://iadr.confex.com/iadr/2009miami/webprogram/Paper117845.html>

Daroux, F., Carr, D. J., Kieser, J., Niven, B., & Taylor, M. (2009). Blunt force impact and laundering of fabric for forensic evidence. In C. A. Wilson & R. M. Laing (Eds.), *Proceedings of the Combined (NZ and AUS) Conference of The Textile Institute: Natural Fibres in Australasia: Book of abstracts*, (pp. 44). Dunedin, New Zealand: The Textile Institute (NZ).

Desai, S. V., Love, R. M., Rich, A. M., & Seymour, G. J. (2009). Expression of Toll-like receptor-2 in periapical lesions of endodontic origin. *International Endodontic Journal*, 42(12), (pp. 1135). doi: 10.1111/j.1365-2591.2009.01618.x

Hauman, C. H. J., Aziz, A., Tompkins, G. R., Chandler, N. P., & Leichter, J. W. (2009). Root-end cavity disinfection with chlorhexidine and laser. *International Endodontic Journal*, 42(12), (pp. 1149-1150). doi: 10.1111/j.1365-2591.2009.01618.x

Kieser, J. (2009). Silence of the limbs: Reinventing forensic anthropology. *Homo*, 60(3), (pp. 247). doi: 10.1016/j.jchb.2009.02.015

Kieser, J., TeMoananui, R., Herbison, P., & Liversidge, H. (2009). The estimation of dental age in Maori, Pacific Island and European children. *Homo*, 60(3), (pp. 247-248). doi: 10.1016/j.jchb.2009.02.016

Lang, N. P., Schaetzle, M., Faddy, M. J., Cullinan, M., Seymour, G. J., Bürgin, W., & Löe, H. (2009). Predictive factors in the clinical course of chronic periodontitis. *Proceedings of the International Association for Dental Research (IADR)/American Association for Dental Research (AADR)/Canadian Association for Dental Research (CADR) 87th General Session and Exhibition*. Retrieved from <http://iadr.confex.com/iadr/2009miami/webprogram/Paper117851.html>

Leishman, S. J., Ford, P. J., Rothnie, J., Bohnstedt, S., Cullinan, M. P., Westerman, B., Carle, A., Anderson, V., Heng, N., & Seymour, G. J. (2009). Antibody response to self and *Pgingivalis* heat-shock-proteins in cardiovascular patients. *Proceedings of the International Association for Dental Research (IADR)/American Association for Dental Research (AADR)/Canadian Association for Dental Research (CADR) 87th General Session and Exhibition*. Retrieved from <http://iadr.confex.com/iadr/2009miami/webprogram/Paper117826.html>

Rose-Hill, S., Ford, P. J., Do, H. L., Seymour, G. J., & Cullinan, M. P. (2009). Improvement in periodontal health and systemic markers of inflammation. *Proceedings of the International Association for Dental Research (IADR)/American Association for Dental Research (AADR)/Canadian Association for Dental Research (CADR) 87th General Session and Exhibition*. Retrieved from <http://iadr.confex.com/iadr/2009miami/webprogram/Paper117135.html>

Conference Contribution - Verbal presentation and other Conference outputs

- Aziz, A. (2009, March). *Root-end cavity disinfection with chlorhexidine and laser*. Verbal presentation at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.
- Aziz, A. (2009, May). *Single visit root canal treatment and endodontic surgery in a single visit*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.
- Brown, S. (2009, March). *Immediately restored single implants in the anterior maxilla using a novel design*. Verbal presentation at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.
- Chang, C. (2009, March). *Effects of high-speed grinding with diamond burs on four all-ceramic veneering porcelains*. Verbal presentation at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.
- Keng, B. (2009, March). *Rate of space closure using NiTi T-loop: A prospective RCT*. Verbal presentation at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.
- Kieser, J. (2009, July). *Silence of the limbs: Forensic research at Otago*. Keynote speaker at the Biolive: Transformation & Change Conference, Dunedin, New Zealand.
- Kieser, J. (2009, March). *Tongue pressure patterns during normal swallowing*. Verbal presentation at the 17th Annual Dysphagia Research Society (DRS) Meeting, New Orleans, LA.
- Praveen, P.V., Seymour, G. J., Rich, A. M., Horne, L., & Hussaini, H. M. (2009, June). *Proinflammatory and immunoregulatory T cells in periodontal disease*. Verbal presentation at the New Zealand Australasian Society for Immunology (NZ ASI) Branch Meeting, Wellington, New Zealand.
- Seymour, G. J., Rich, A. M., Firth, N. A., Horne, L., Praveen, P.V., & Hussaini, H. M. (2009, June). *Increased number of TLR2+FoxP3+ regulatory T cells and possible contact-dependent association of TLR2 and regulatory T cells in tumour infiltrating lymphocytes within oral squamous cell carcinoma*. Verbal presentation at the New Zealand Australasian Society for Immunology (NZ ASI) Branch Meeting, Wellington, New Zealand.

Commissioned Report for External Body

- McGrath, T., Anderson, V., Ching, C. P., Doi, A., Stock, P., & International Student Ministries of New Zealand Inc (2009). *Tracking study series of Asian business graduates [Asia:NZ Research: Report 1]*. Commissioned by Asia New Zealand Foundation. Wellington: Asia:NZ Foundation, 26p.

Working Paper; Discussion Paper; Technical Report

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Conference Contribution - Verbal presentation and other Conference outputs

Abduo, J., Bennani, V., Waddell, N., Lyons, K., & Swain, M. (2009, June). *Strain distribution in the human mandible as a result of misfit of fixed partial implant-supported prosthesis: A preliminary result*. Verbal presentation at the 3rd Annual Biomouth Symposium, Dunedin, New Zealand.

Bennani, V. (2009, May). *A novel non-traumatic gingival retraction technique for a deeply placed implant*. Keynote address at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.

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Conference Contribution - Poster Presentation (not in published proceedings)

Farah, R. A., Monk, B. C., Swain, M.V., & Drummond, B. K. (2009, September). *Protein content of molar-incisor hypomineralisation enamel*. Poster session presented at the Third Annual Division of Health Sciences Research Forum, Wellington, New Zealand.

Conference Contribution - Verbal presentation and other Conference outputs

Cameron, H. (2009, May). *Maxillofacial trauma: Pan mid-face fractures*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.

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Desai, S.V., Love, R. M., Rich, A. M., & Seymour, G. J. (2009). Expression of Toll-like receptor-2 in periapical lesions of endodontic origin. *International Endodontic Journal*, 42(12), (pp. 1135). doi: 10.1111/j.1365-2591.2009.01618.x

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De Silva, H. (2009, May). *Surgical management of facial disfigurement: Experience from a provincial hospital in a developing country*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.

Goldsmith, S. (2009, May). *A severe complication of toothache*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.

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Praveen, P.V., Seymour, G. J., Rich, A. M., Horne, L., & Hussaini, H. M. (2009, June). *Proinflammatory and immunoregulatory T cells in periodontal disease*. Verbal presentation at the New Zealand Australasian Society for Immunology (NZ ASI) Branch Meeting, Wellington, New Zealand.

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Dr Kyoko Niimi in the Molecular Microbiology Laboratory.

2010 PUBLICATIONS

DENTISTRY (DEAN'S DEPARTMENT)

Edited Book - Research

Seymour, G. J., Cullinan, M. P., & Heng, N. C. K. (Eds.). (2010). *Oral Biology*. New York: Springer; 360p.

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- Ford, P. J., Raphael, S. L., Cullinan, M. P., Jenkins, A. J., West, M. J., & Seymour, G. J. (2010). Why should a doctor be interested in oral disease? *Expert Review of Cardiovascular Therapy*, 8(10), 1483-1493. doi: 10.1586/erc.10.109
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Smith, M., Seymour, G. J., & Cullinan, M. P. (2010). Histopathological features of chronic and aggressive periodontitis. *Periodontology 2000*, 53(1), 45-54. doi: 10.1111/j.1600-0757.2010.00354.x

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Journal - Research Other

O'Shea, C., Quick, A., Johnson, G., Carman, A., & Herbison, P. (2010). The effect of a Clark twin block on mandibular motion: A case report. *Australian Orthodontic Journal*, 26(2), 189-194.

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Cullinan, M. P., & Seymour, G. J. (2010). Understanding risk for periodontal disease. *Annals of the Royal Australasian College of Dental Surgeons*, 20, (pp. 86-87).

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Alothmani, O., Chandler, N., Friedlander, L., & Monteith, B. (2010). Influence of clinical experience on radiographic evaluation of the quality of root canal treatment and accuracy of working length determinations. *Proceedings of the Faculty of Dentistry 3M Research Day*. Retrieved from <http://dentistry.otago.ac.nz/research/index.html>

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Lin, K. (2010, May). *Management of an Endo-Perio lesion*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.

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Conference Contribution - Published proceedings: Full paper

- Cullinan, M. P., & Seymour, G. J. (2010). Understanding risk for periodontal disease. *Annals of the Royal Australasian College of Dental Surgeons*, 20, (pp. 86-87).

Conference Contribution - Published proceedings: Abstract

- Baharuddin, N., Duncan, W., Coates, D., Seymour, G., & Cullinan, M. (2010). Expression of RANK, RANKL and OPG protein in surgically created periodontal defects in the sheep model. *Proceedings of the Faculty of Dentistry 3M Research Day*. Retrieved from <http://dentistry.otago.ac.nz/research/index.html>
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- Farella, M. (2010). Challenging an orthodontic dogma: The impact of masticatory function on malocclusion and craniofacial form. *Proceedings of the Faculty of Dentistry 3M Research Day*. Retrieved from <http://dentistry.otago.ac.nz/research/index.html>

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- Timmins, K. A., Kieser, J. A., Harding, W. J., & Thomson, W. M. (2010). Aspects of cervical vertebral growth and dental development in New Zealand children. *HOMO*, 61(3), (pp. 219). doi: 10.1016/j.jchb.2010.01.039

Conference Contribution - Verbal presentation and other Conference outputs

- Carr, D. J., Kemp, S. E., Kieser, J., Niven, B. E., & Taylor, M. (2010, September). *Reproducing 'real' stabbing events in the laboratory: The importance of a textile science perspective*. Verbal presentation at the Personal Armour Systems Symposium (PASS), Quebec City, Canada.
- Farella, M. (2010, April). *Challenging an orthodontic dogma: The impact of masticatory function on malocclusion and craniofacial form*. Keynote address at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.
- Hannah, A. (2010, November). *God image, gender and language: A pastoral issue?* Verbal presentation at the Pastoral/ Practical Theology in Aotearoa New Zealand Conference: Being Christian in the South Pacific: Kiwi Christian Practice, Dunedin, New Zealand.
- Hasmun, N. (2010, May). *Dentine hypomineralisation*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.
- Hidayat, F. (2010, May). *Localized severe periodontitis in the mandibular molar associated with cervical enamel projections: A case report and mini-review*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.
- Kieser, J. (2010, March). *Child abuse and the dentist: Current research and challenges*. Invited speaker at the 16th Biennial Convention of the Australian and New Zealand Society of Paediatric Dentistry, Queenstown, New Zealand.
- Noor, E. (2010, May). *The importance of the periodontal review in periodontal therapy*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.
- Quick, A., Colquhoun, A., & Hibbert, S. (2010, March). *Interdisciplinary treatment for children*. Panel discussion at the 16th Biennial Convention of the Australian and New Zealand Society of Paediatric Dentistry, Queenstown, New Zealand.
- Timmins, K. (2010, May). *My teeth don't meet: The challenges associated with the treatment of anterior open bites*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.

Inaugural Professorial Lecture

- Farella, M. (2010, September). *From orthodontics to neurosciences*. University of Otago, Dunedin, New Zealand.
Public Lecture
- Thomson, W. M. (2010, September). *The "falsies" generations no more: The emerging new order of oral health*. University of Otago Winter Lecture Series. Auckland, New Zealand.
- Thomson, W. M. (2010, September). *The "falsies" generations no more: The emerging new order of oral health*. University of Otago Winter Lecture Series. Wellington, New Zealand.

Journal Editor

- Armitage, G. C., Cullinan, M. P., & Seymour, G. J. (Eds.). (2010). *Periodontology 2000*, 53.

ORAL DIAGNOSTIC & SURGICAL SCIENCES

Chapter in Book - Research

Payne, A. G.T., Tawse-Smith, A., De Silva, R. K., & Duncan, W. J. (2010). Early and conventional loading: Early loading of two implants in the mandible and final restoration with a retentive-anchor-supported RDP. In D. Wismeijer, D. Buser, & U. Belser (Eds.), *ITI treatment guide: Loading protocols in implant dentistry: Edentulous patients (Vol. 4)* (pp. 76-84). Berlin, Germany: Quintessence.

Journal - Research Article

- Alsabeeha, N. H. M., De Silva, R. K., Thomson, W. M., & Payne, A. G.T. (2010). Primary stability measurements of single implants in the midline of the edentulous mandible for overdentures. *Clinical Oral Implants Research*, 21, 563-566. doi: 10.1111/j.1600-0501.2009.01890.x
- Atieh, M. A., Payne, A. G.T., Duncan, W. J., de Silva, R. K., & Cullinan, M. P. (2010). Immediate placement or immediate restoration/loading of single implants for molar tooth replacement: A systematic review and meta-analysis. *International Journal of Oral and Maxillofacial Implants*, 25(2), 401-415.
- Becconsall-Ryan, K., Tong, D., & Love, R. (2010). Radiolucent inflammatory jaw lesions: A twenty-year analysis. *International Endodontic Journal*, 43, 859-865. doi: 10.1111/j.1365-2591.2010.01751.x
- Campbell, D. I., Kuzmanovic, D., & DeSilva, R. K. (2010). Bimaxillary osteotomy in a young, edentulous patient with LADD syndrome. *Journal of Oral and Maxillofacial Surgery*, 68(7), 1685-1690. doi: 10.1016/j.joms.2009.07.095
- Niimi, M., Firth, N. A., & Cannon, R. D. (2010). Antifungal drug resistance of oral fungi. *Odontology*, 98(1), 15-25. doi: 10.1007/s10266-009-0118-3
- Rosdy, N. M. M. N. M., Firth, N. A., & Rich, A. M. (2010). Calibre-persistent labial artery: Often misdiagnosed as a mucocoele. *International Journal of Oral and Maxillofacial Surgery*, 39(12), 1230-1239. doi: 10.1016/j.ijom.2010.05.003
- Tong, D. C., Kumar, R. R., Kok, S., De Silva, R. K., & Thomson, W. M. (2010). Patterns of maxillofacial fracture presentation in Dunedin from 2000 to 2005. *New Zealand Dental Journal*, 106(1), 16-19.
- Tong, D., Dawson, J., & Love, R. (2010). Factors affecting oral health status in an elderly military veteran population in New Zealand. *Journal of Military Veterans' Health*, 18(3), 12-17.
- Willis, D. H. R., Tong, D. C., Thomson, W. M., & Love, R. M. (2010). Maxillofacial trauma and the GDP: Speciality recognition and patterns of referral. *New Zealand Dental Journal*, 106(3), 97-102.
- Zhou, J., Paul, A., Bennani, V., Thomson, W. M., & Firth, N. (2010). New Zealand dental practitioners' experience of patient allergies to dental alloys used for prosthodontics. *New Zealand Dental Journal*, 106(2), 55-60.
- Conference Contribution - Published proceedings: Abstract
- Anderson, V., Tawse-Smith, A., & Rich, A. (2010). Shifting countries, classrooms and clinics: Facilitating smooth transitions for students in partnered dental education. *Proceedings of the Tertiary Education Research in New Zealand (TERNZ) Conference*, (pp. 5-7). Retrieved from <http://www.herdsa.org.nz/Ternz/2010/programme.html>
- Goldsmith, S., Love, R., De Silva, R., & Herbison, P. (2010). Influence of pedicle flap design on healing and post operative sequelae after lower third molar removal. *Proceedings of the Faculty of Dentistry 3M Research Day*. Retrieved from <http://dentistry.otago.ac.nz/research/index.html>
- Hamzah, S., Love, R., & MacFadyen, E. (2010). The development of special needs dentistry: A situational analysis (Based on New Zealand experience). *Proceedings of the Faculty of Dentistry 3M Research Day*. Retrieved from <http://dentistry.otago.ac.nz/research/index.html>
- Lin, K., Love, R., Friedlander, L., & Seymour, G. (2010). Unravelling the pathogenesis of invasive cervical root resorption. *Proceedings of the Faculty of Dentistry 3M Research Day*. Retrieved from <http://dentistry.otago.ac.nz/research/index.html>
- Love, R. M., Friedlander, L. T., & Lin, Y. P. (2010). Association of the TLR2/TLR4 and RANK/RANKL/OPG expression in inflammatory root resorption. *Proceedings of the 88th General Session & Exhibition of the International Association for Dental Research (IADR)*. Retrieved from <http://www.iadr.org/i4a/pages/index.cfm?pageid=3854>
- Mohd, S., Rich, A., Firth, N., Milne, T., & Seymour, G. (2010). Does the Toll-Like Receptor-2 (TLR2) play a role in Oral Mucosal Lichen Planus (OMLP)? *Proceedings of the Faculty of Dentistry 3M Research Day*. Retrieved from <http://dentistry.otago.ac.nz/research/index.html>

Nolan, A., Mansfield, J., Mentzer, A., Sanderson, J., Prescott, N., & Mathew, C. (2010). An evaluation of the genetic relationship between orofacial granulomatosis and crohn's disease. *Oral Diseases*, 16(6), (pp. 526). doi: 10.1111/j.1601-0825.2010.01743.x

Siddiqui, A., Payne, A., Duncan, W., & De Silva, R. (2010). Surgical and peri-implant outcomes of ceramic implants supporting overdentures. *Proceedings of the Faculty of Dentistry 3M Research Day*. Retrieved from <http://dentistry.otago.ac.nz/research/index.html>

Conference Contribution - Verbal presentation and other Conference outputs

Choi, H., & Best, A. (2010, May). *Osteoma and Gardner's Syndrome*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.

Hamzah, S. (2010, May). *Small mouth - big problems: Dental implications of scleroderma*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.

Hussaini, H. (2010, May). *Identification of metallic substances in oral pigmented lesions using SCM EDS: A case report*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.

Nolan, A. (2010, May). *Looking in the mouth for Crohn's disease*. Verbal presentation at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.

Quick, A., Colquhoun, A., & Hibbert, S. (2010, March). *Interdisciplinary treatment for children*. Panel discussion at the 16th Biennial Convention of the Australian and New Zealand Society of Paediatric Dentistry, Queenstown, New Zealand.



Winners of Sir John Walsh Research Institute and Director's Awards, December 2010. Standing back left to right: Professor Jules Kieser, Michael Smith, Professor Richard Cannon, Professor Murray Thomson, Dr Eric Lord, Janeece Park. Seated front left to right: Trish Ferrier, Anna Lind, Dr Michele Coleman, Professor Greg Seymour, Jenine Uprichard.

Summer Studentships

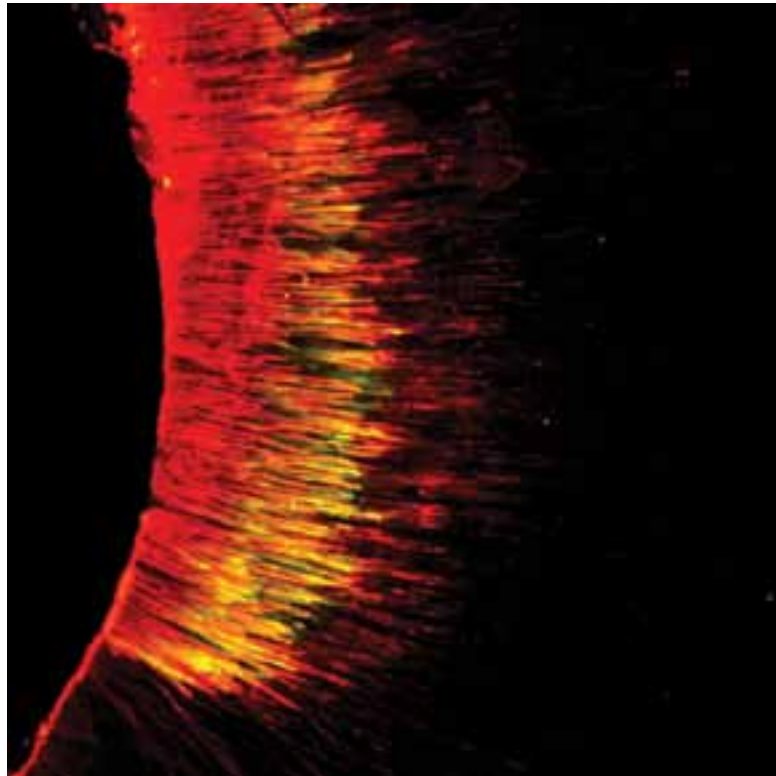
2008/2009

| STUDENT | COURSE | TITLE OF RESEARCH PROJECT 2008-2009 | SUPERVISOR | AWARD |
|------------------|--------|--|---|---|
| Azza Al-Ani | BDS | Gingival retraction techniques for fixed prosthodontics and implant impressions: A New Zealand Survey | Dr V Bennani, Associate Professor N Chandler, Mr K Lyons | R C Tonkin (NZDARF) |
| Elvira Beliak | BDS | A comparison of the subgingival microbiota following laser and conventional mechanical debridement | Mr J Leichter, Mr D Holborow | New Zealand Society of Periodontology |
| Amanda Buxcey | BOH | Study into the feasibility and acceptability for the delivery of the oral health message in community pharmacies in the Greater Dunedin area | Mrs A Meldrum, Ms K Morgaine | Colgate |
| Angharad Carter | BDS | Design of an oral health brochure for at-risk individuals | Mrs A Meldrum, Ms K Morgaine | Colgate |
| Myles Chen | BDS | Molecular Basis of Antifungal Binding of BM2 Peptide to Plasma Membrane H ⁺ -ATPase | Dr Mikhail Keniya, Dr Ann Holmes | Auckland Dental Association |
| James Dawson | BDS | Oral Health Needs of New Zealand War Veterans Residing in an Aged Care Facility | Mr D Tong | Sir John Walsh (NZDARF) |
| Hannah Green | BDS | Examining the Tooth Crown of <i>Sphenodon punctatus</i> (Tuatara) | Professor J Kieser, Dr W Duncan | Otago Branch NZDA |
| Nurul Haji-Ishak | BDS | Revealing the genomic secrets of <i>Streptococcus salivarius</i> strain Mia | Dr N Heng | Division of Health Sciences |
| Abby Hodgson | BDS | Expressing the human BK potassium channel protein in <i>Saccharomyces cerevisiae</i> for functional analysis | Dr A Holmes, Dr K Niimi, Professor R Cannon | Sir John Walsh (NZDARF) |
| Joy Tahere | BDS | Cranial Suture Morphology in the Tuatara, <i>Sphenodon punctatus</i> | Professor J Kieser, Professor M Swain, Dr W Duncan | R C Tonkin (NZDARF) |
| Andrew Wong | BDS | Sequencing and Annotating the Genome of <i>Streptococcus salivarius</i> JH | Dr N Heng | Division of Health Sciences |

2009/2010

| STUDENT | COURSE | TITLE OF RESEARCH PROJECT 2008-2009 | SUPERVISOR | AWARD |
|----------------------|--------|--|--|-----------------------------------|
| Phillipa Greer | BDS | Histomorphometric analysis of submerged, unloaded, bimodal-surface Neoss implant in the sheep femur augmented with a novel bone-promoting keratin hydrogel (Keratee) | Dr W Duncan, Dr C He | Faculty of Dentistry |
| Poppy Horne | BDS | Improving preparation finishing lines with a novel atraumatic ultrasonic instrument: a pilot study | Dr V Benanni, Associate Professor D Purton, Associate Professor N Chandler | Satelec Acteon Equipment (France) |
| Alaina Kalyan | BOH | Filling in the gaps of <i>Streptococcus salivarius</i> M18 genome sequence | Dr N Heng | Otago Branch NZDA |
| Michelle Kang | BDS | The School of Dentistry educational environment and future professional work: Students' perceptions at the start and end of their first professional year | Dr L Foster Page, Dr V Anderson | Auckland Dental Association |
| Grace Lee | BDS | Inhibiting drug efflux pumps relevant to fungal infections and cancer: developing fluorescence assays of efflux | Dr A Holmes, Dr K Niimi, | Division of Health Sciences |
| Jessica Li | BDS | Anodisation does not affect osseointegration of osstem implants in unloaded sheep mandible after 1 month | Dr W Duncan | Faculty of Dentistry |
| Blake Moore | BDS | Equipping Biofactories with Efflux Pumps | Dr B Monk | Sir John Walsh (NZDARF) |
| Jessica Po | BDS | Variability in the natural human chewing pace | Professor M Farella | R C Tonkin (NZDARF) |
| Jung Houn (Alice) So | BDS | Optimisation of a universal 16s rRNA primer/probe set for quantification of oral pathogens | Dr T Milne, Mr J Leichter, Associate Professor M Cullinan, Dr N Heng | Faculty of Dentistry |
| Karan Taneja | BDS | The antimicrobial effect of honey against bacterial strains found in the oral cavity | Dr G Tompkins, Mrs J Upritchard | Comvita |
| Merana Tumohe | BDS | Investigating the use of mini dental implants in New Zealand | Mr J Boyens, Dr W Duncan, Professor M Thomson | NZ Society of Periodontology |
| Andrew Wong | BDS | Bridging the Unknown: Filling the Gaps in the <i>Streptococcus salivarius</i> JH Genome Sequence | Dr N Heng | Division of Health Sciences |

| | | | | |
|-----------------------|-----|--|-------------------------------------|----------------------------|
| Zhi (Rena) Xu | BDS | Smile for the Nurse – an evaluation of the acceptability of primary health care nurses delivering oral health messages | Ms S Moffat, Mrs A Meldrum | Faculty of Dentistry |
| Yingzhi Xu | BDS | The Role of Erosion in Non-cariou Cervical Lesions | Dr C He | Faculty of Dentistry |
| Yilong (Michael) Zhao | BDS | Evaluation of an <i>in-vitro</i> wounding model for human gingival fibroblast | Dr D Coates, Professor G Seymour | Sir John Walsh (NZDARF) |



Confocal microscope image showing bacterial invasion of a root canal lumen.

Invited Presentations

VIVIENNE ANDERSON

BRCSS Research Conference, Wellington, 10-12 June 2009.

"The importance of impurity: reflections on a social group for international and local women in internationalised higher education."

JOHN BROUGHTON

International Association for Dental Research General Session, Barcelona, Spain, 17 July 2010.

"Oral Health Interventions among Indigenous Populations in New Zealand."

International Association for Dental Research General Session, Barcelona, Spain, 17 July 2010. Invited to Co-chair Symposium

"Reducing Dental Disease Burden and Oral Health Inequalities among Indigenous Populations".

RICHARD CANNON

New Zealand Yeast Group, Bethell's Beach, Auckland, 11 February 2009.

"Yeast research at the University of Otago."

Tokyo Institute of Technology, Tokyo, Japan, 25 May 2009.

"Efflux-mediated drug resistance of *Candida albicans*."

Jawaharlal Nehru University, New Delhi, India, 2 June 2009.

"Overcoming efflux-mediated drug resistance of *Candida albicans*."

Malaghan Institute of Medical Research, Wellington, 17 July 2009.

"Heterologous expression of membrane proteins in *Saccharomyces cerevisiae*."

Department of Pharmacy, University of Otago, Dunedin, 7 August 2009.

"Antifungal drug development."

Hopkirk Research Institute, Palmerston North, 17 February 2010.

"Heterologous expression of membrane proteins in *Saccharomyces cerevisiae* to overcome drug resistance: from fungi to higher eukaryotes."

NICHOLAS CHANDLER

"Collaborative treatment for the adult patient". A day of evidence-based lectures on provisional restorations, coronal leakage, when to restore and when to recall and evidence for selection of certain types of restoration and how they influence tooth survival (A New Zealand Dental Association Education Trust Day Course), Christchurch, May 2009.

"Collaborative treatment for the adult patient". A day of evidence-based lectures on provisional restorations, coronal leakage, when to restore and when to recall and evidence for selection of certain types of restoration and how they influence tooth survival (A New Zealand Dental Association Education Trust Day Course), Nelson, December 2009.

Otago Branch, New Zealand Dental Association, February 2010.

"How thick are teeth, and why should anyone care?"

Australian Society of Endodontology, Western Australia Branch, Perth, Australia, June 2010.

"Testing and measuring things in endodontics" and "At the back and dead or alive- the challenges of pulp testing molars."

MARY CULLINAN

Colgate Research & Technology Center, Piscataway NJ, USA, September 2009.

“Does Long-term Use of Triclosan Toothpaste lead to Bacterial Resistance?”

The Philippines Society for Periodontology, Manila, Philippines, October 2009.

“Understanding Risk For Periodontal Disease.”

Oral Systemic Workshop, Sydney, Australia, November 2009.

“Current Status of the Oral Systemic Connection.”

The Royal Australasian College of Dental Surgeons 20th Convocation, Perth, Australia, March 2010.

“Understanding Risk for Periodontal Disease.”

Colgate Travelling Lecturer Programme, Auckland, April, 2010.

“Oral Diseases and Lifestyle: Can we ignore it?”

Dental Hygienists' Association of Australia, Perth, Australia, October 2010.

“Genetic and Environmental Risk factors for Periodontal Disease.”

Dental Hygienists' Association of Australia, Perth, Australia, October 2010.

“The Impact of Oral Disease on Systemic Health”.

Australian Society of Periodontology (Queensland Branch), Brisbane, Australia, October 2010.

“New Perspectives in Risk Profiling in Periodontics.”

Australian Society of Periodontology (Queensland Branch), Brisbane, Australia, October 2010.

“Systemic Disease and Risk Profiling in Dental Practice.”

Taiwan Association for Dental Science, Taipei, Taiwan, November 2010.

“Understanding Risk for Periodontal Disease.”

National Taiwan University, Taipei Taiwan, November 2010.

“Periodontal Disease and Systemic disease.”

HARSHA DE SILVA

Invited lecture for the Faculty of Dentistry-Clinical Excellence Day, Dunedin, May 2009.

“Dento-facial deformities - An experience from a Provincial Hospital in Sri Lanka.”

ROHANA KUMARA DE SILVA

6th Annual Scientific Sessions of the Sri Lanka Academy of Aesthetic and Cosmetic Dentistry, Sri Lanka, 31 October - 1 November 2009.

“Osseointegration: Is it the way forward in facial aesthetics?”

32nd Asia Pacific Dental Congress, Sri Lanka, 12-16 May 2010.

“Complications that can be associated with oral surgery procedures.”

WARWICK DUNCAN

Zürich University, July 2010.

“Dental implant testing in the domestic sheep *ovis aries*. Existing models, current results, relevance?”

Keynote speaker, IADR ANZ Division Golden Jubilee meeting, Kiama Australia, September 2010.

“Dental Implants - does animal research inform our clinical practice?”

MAURO FARELLA

Clinical course to the ex-alumni in Orthodontics, University of Geneva, Sils Maria, Switzerland, 16-17 January 2009.

"Orthodontics and temporomandibular disorders."

International Conference on Orofacial Pain and Temporomandibular Disorders ICOT2009, Bahia, Brazil, 26-28 August 2009.

"Occlusal and craniofacial features: risk factors for TMD?"

Meeting "La Terapia del Paziente con Disordini Craniomandibolari: Quale Evidenza?", Ferrara, 21 March 2009.

"Mioartropatie masticatorie: dalle cause alla terapia."

7th International Orthodontic Congress, Sydney, Australia, 6-9 February 2010.

"Orofacial musculature and orthodontics: clinical and research implications."

Symposium on Computational Modelling, University of Otago, 19 March 2010.

"Modelling electromyographic signals of the masticatory muscles."

Keynote lecture, Research Day, Faculty of Dentistry, University of Otago, April 2010.

"Challenging an orthodontic dogma: the impact of masticatory function on malocclusion and craniofacial form".

International meeting: "Recent Research Advances in Orofacial Pain, Motor Function" Tribute to S.Palla & A.Woda. Siena, Italy, 6-9 May 2010.

"Stereotypic masticatory muscle contractions: a possible explanation for TMDs?"

Symposium im Rahmen der Besetzung der Professur Kieferorthopädie und Kinderzahnmedizin, Universität Zürich, 7 June 2010.

"Impact of jaw function on craniofacial morphology."

International meeting of the New Zealand Association of Orthodontics – Advances in Orthodontics, Christchurch, 30 June-3 July 2010.

"Introduction to diagnosis and management of masticatory function disorders" and

"Effect of oral parafunctions on masticatory muscles and temporomandibular joints."

First workshop of the Centre for Bioengineering and Nanomedicine, University of Otago, September 2010.

"Bioengineering in Dental sciences."

Inaugural Professorial Lecture, University of Otago, 2010.

"From orthodontics to neurosciences."

International Conference of the European Academy of Craniomandibular Disorders: *Pain and dysfunction: an update on diagnosis and therapy*, Naples, Italy 23-26 September 2010.

"Can parafunction overload the stomathognathic system?"

NICHOLAS HENG

1st Next-Generation Sequencing Workshop, Palmerston North, 2009

"Revealing the genomic secrets of the oral bacterium *Streptococcus salivarius* using the Genome Sequencer FLX System" (Heng N, Haji-Ishak N, Wong A, Stanton J-A, Cullinan M, Tagg J).

ROSEMARY KARDOS

Invitation from the Alaska Native Tribal Health Consortium and the Alaska Tribes to Anchorage Alaska and present at the 3rd Annual meeting of the Alaska Dental Therapists, 2-6 November 2009.

JULES KIESER

Invited podium presentation, 17th Annual Dysphagia Research Society Meeting, New Orleans, United States, 4-7 March 2009 (Winner, Award of Achievement for 3rd Best Presentation at Conference).

"Tongue pressure patterns during water swallowing."

Keynote address, Biolive Conference, Dunedin, 7 July 2009.

"Silence of the limbs: Forensic biology research at Otago."

Invited podium presentation, 18th Annual Dysphagia Research Society Conference, San Diego, United States of America 4-6 March 2010.

"Stability of intra-oral pressure patterns during swallowing."

Keynote address, 16th Biennial Convention Australian and New Zealand Society of Paediatric Dentistry, Queenstown, 28-30 March 2010.

"Child abuse and the dentist: Current research and challenges."

Invited Plenary Lecture, Food Oral Processing Conference, Leeds, United Kingdom, 5-7 July 2010.

"Tongue palate interactions during swallowing."

ERWIN LAMPING

Oral Microbiology and Dental Health Research Theme Mini Symposium, Dunedin, 4 December 2009.

"Novel motifs and evolution of the large family of pleiotropic drug resistance (PDR) transporters."

10th ASM Conference on Candida and Candidiasis, Miami, Florida, US, 22-26 March 2010.

"Concerted evolution of *Candida krusei* multidrug efflux pumps ABC1 and ABC11 - a highly homologous pair of tandem-duplicated genes."

Austrian Center of Industrial Biotechnology, Graz University of Technology, Graz, Austria, 21 April 2010.

"Study of multidrug efflux pumps in a specially modified *Saccharomyces cerevisiae* host."

JONATHAN LEICHTER

Lumino Dental Group Annual Conference, Arrowtown, April 2010.

"Clinical Crown Lengthening In General Dental Practice."

ROBERT LOVE

Asia Pacific Endodontic Confederation, Tokyo, 24-26 April 2009.

"Bacterial infection of dentine-does it follow the principles of colonization?"

New Zealand Prosthodontic Academy, Wellington, 9 May 2009.

"Factors influencing treatment planning decisions of single-tooth implants versus preserving natural teeth with nonsurgical endodontic therapy."

European Society of Endodontology Congress, Edinburgh, 24 August-16 September 2009.

"An analysis of radiolucent lesions of the jaws."

Association of Australia and New Zealand Prosthodontists Biennial Conference Werribee, Melbourne, 17-19 June 2010.

"Outcome factors influencing treatment planning decisions of single-tooth implants versus preserving natural teeth with nonsurgical endodontic therapy."

New Zealand Orthodontic Association, Christchurch, 2 July 2010.

"Update of current regulations from the DCNZ for orthodontists and Update of current regulations from the DCNZ for orthodontic auxiliaries."

Australian Endodontic Society (Queensland Branch), 20 August 2010.

"Aspects of endodontic microbiology."

Trans-Tasman Endodontic Conference Christchurch, 4-6 November 2010.

"Microbiological aspects of endodontic retreatment."

University of Southern California Ninth International Endodontics Symposium, 19-20 November 2010.

"The effect of bioactive molecules in preventing bacterial invasion of dentin."

ANITA NOLAN

Department of Medicine, Christchurch Campus, University of Otago, 11 December 2009.

"An overview of recent research in Oral Crohns Disease."

University of Kuwait, Faculty of Dentistry, on behalf of the Royal College of Surgeons in Ireland, February 2010.

"An Update on Salivary Gland Disease."

NZDA, Christchurch 1 March 2010, Wellington 2 March 2010, Auckland 3 March 2010.

"The interface between dentistry and medicine: Gastroenterology."

"Epithelium 2010", University of Otago, 27 March 2010.

"Research into Inflammatory Bowel Disease: an Oral Perspective."

Immunology & Dermatology Research Group, Auckland Hospital, 28 May 2010.

"An update on recent research into Orofacial Granulomatosis."

Invited by Head and Neck Oncology Group, Dunedin Hospital July 2010.

Recent advances in Oral Medicine.

One of 27 abstracts selected from 254 submissions for presentation at the European Association of Oral Medicine, London, 2010.

"An evaluation of the genetic relationship between Orofacial Granulomatosis and Crohn's Disease."

Colorectal Surgeons of Otago & Southland Meeting, Dunedin Hospital 15 October 2010.

"Research into Crohn's Susceptibility genes in Orofacial Granulomatosis."

ALISON RICH

Waikato Branch, New Zealand Dental Association, May 2009

"Assessment of potentially malignant oral lesions" and "Vesiculo-bullous disorders".

Inaugural Peter C Reade Memorial Lecture, Oral Medicine Society of Australia and New Zealand Annual Meeting, Gold Coast, October 2009.

"Assessing the malignant potential of oral lesions."

Lecture in Special Lecture Series sponsored by Chonam National University, Gwangju, South Korea, 23 August 2010.

"Kia Ora from the University of Otago: Current work on immune cells in oral mucosal diseases."

GREGORY SEYMOUR

University of Chile, Santiago, Chile, April 2009.

"Dental education in the 21st century: where is research leading us?"

A one day course for the Chilean Society for Periodontology, Santiago, Chile, April 2009.

"The immunopathogenesis of chronic periodontitis and peri-implantitis."

University of Antofagasta, Antofagasta, Chile, April 2009.

"Multidisciplinary research: A new paradigm for the 21st century."

Australian and New Zealand Academy of Periodontists, Adelaide, Australia, May 2009.

"Molecular mimicry: How does it work?"

Hospital Dentists Conference, Queenstown, New Zealand, July 2009.

"Outplacement of final year dental students."

The British Society for Periodontology, London, September 2009.

"From York to Dunedin: Life after the Fish Prize."

The Philippines Society for Periodontology, Manila, October 2009.

"The periodontal-systemic connection."

The Philippines Society for Periodontology, Manila, October 2009.

"Treatment planning in periodontics: *Where have we come from? where are we now? where are we going? and how are we getting there?*"

Australian Dental Association NSW Country Convention, Canberra, Australia, November 2009.

"Products and Trends."

Australian Dental Association NSW Country Convention, Canberra, Australia, November 2009.

"Periodontal Horoscopes."

Royal Society of New Zealand Symposium, Christchurch, New Zealand, November 2009.

"Periodontology: What is it?"

University of Malaya, Kuala Lumpur, Malaysia, June 2010.

"Susceptibility to periodontal disease."

University of Malaya, Kuala Lumpur, Malaysia, June 2010.

"Infection or inflammation - the oral-systemic connection: How does it work?"

70th Anniversary Meeting Chulalongkorn University, Bangkok, Thailand, August 2010.

"From basic science to clinical practice: The role of dental education."

National Taiwan University Taipei, Taiwan, November 2010.

"Dental education: Challenges for the 21st century."

Taiwanese Association for Dental Science, Taipei, Taiwan, November 2010.

"The periodontal-systemic connection: Molecular mimicry and what it means for the general dentist."

DON SCHWASS

Evening lecture presentation to NZ Institute of Dental Technology (NZIDT), Dunedin, 23 July 2010.

"Caries risk assessment for prosthodontic patients."

Evening lecture presentation to Canterbury Branch of NZ Dental Association, Christchurch, 29 September 2010 at the request of 3M Espe.

"What is minimally invasive dentistry?"

W MURRAY THOMSON

Korero to the Hui Oranga Niho, Huirapa Marae, Karitane, 3 February 2010.

"Public health issues in New Zealand."

Invited presentation to the 16th biennial convention of the Australian and New Zealand Society of Paediatric Dentistry, Queenstown, 29 March 2010.

"Improving the oral health of children and adolescents: the role of health services research."

Keynote address to the Universidad de Chile celebration of the Chilean Bicentennial, Santiago, Chile, 22 April 2010.

"Oral health and disease from childhood to adulthood: some findings from the Dunedin Study."

DARRYL TONG

Invited speaker, University of Otago Research Commercialization Symposium, Dunedin, 29 March 2010.

Australasian Society of Prosthodontists Conference, Werribee, Victoria, 17-19 June 2010.

“Prosthetic rehabilitation of maxillofacial war injuries.”

Medical Education Conference of Aotearoa, Dunedin, 11-12 September 2010.

“The challenges of medicine and surgery in the field.”

Australian Military Medicine Association Conference/Joint Health Command Symposium, Canberra, 28-31 October 2010. Presentation on Combat Related Maxillofacial Injuries.

NEIL WADDELL

New Zealand Institute of Dental Technologists Conference, Auckland, 16-17 October 2009.

“How to deal with residual stress in zirconia ceramic restorations.”

New Zealand Institute of Dental Technologists Annual Conference, Auckland, 16 - 17 October 2009.

“The Influence of Temperature on The Mechanical Properties of Denture Acrylics.”

The Academy Of Australian And New Zealand Prosthodontists, Werribee, Australia, 17-19 June 2010.

“Mandibular flexure and implant superstructure failure.”

International Conference on Structural Integrity and Failure, Auckland, 4-7 July 2010.

“Strength and fracture response of suture repaired rat skin.”

Awards

| | |
|---------------------|---|
| John Boyens | Fellowship of the International College of Dentists, 2010. |
| Richard Cannon | Sir John Walsh Research Institute Research Publication Award, 2010. |
| Mary Cullinan | Fellowship of the International College of Dentists, 2010. |
| Warwick Duncan | Sir John Walsh Research Institute Director's Award for Student Research Support, 2010. |
| Bernadette Drummond | Fellowship (Honourous Causum) Royal College of Surgeons of Edinburgh, 2010. |
| Jules Kieser | Fellowship of the International College of Dentists, 2010. Sir John Walsh Research Institute Clinical Research Award, 2010. |
| Sunyoung Ma | Kate Sheppard Memorial Award, 2010. |
| W Murray Thomson | Fellow of the Academy of Dentistry International, March 2009. Alan Docking Award for distinguished research in dentistry by the Australia-New Zealand Division of the International Association for Dental Research, October 2009. IADR Distinguished Scientist Award (the 2010 H Trendley Dean Memorial Award, for meritorious research in epidemiology and public health) at the 2010 General Session of the International Association for Dental Research, Barcelona, July 2010. Sir John Walsh Research Award, for research over an extended period by a member of the Faculty of Dentistry, Dunedin, December 2010. |
| Gregory Seymour | Sir John Walsh Research Institute Director's Award for Researcher of the Year, 2010 |
| Michael Swain | Sir John Walsh Research Institute Basic Science Award, 2010 |
| Darryl Tong | JMVH prize for best paper published in the Journal of Military and Veterans' Health, 2010. |



Associate Professor Mary Cullinan (seventh from right), Mr John Boyens (fourth from right) and Professor Jules Kieser (second from right) following their induction as Fellows of the Australasian Section of the International College of Dentists in Christchurch on 19 August 2010.

Sponsors

The following is a list of donors who provided financial or in-kind support for research in the Faculty of Dentistry during 2009-2010. Their contributions are greatly appreciated by Faculty and students.

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NZ Dental Association (Otago Branch)
NZ Dental Association Research Foundation
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Vita Zahnfabrik GmbH

Faculty of Dentistry 3M Research Day 2009



The 2009 Faculty of Dentistry 3M Research Day was held on 26 March 2009 at the Hutton Theatre, Otago Museum.

BEST STUDENT ORAL PRESENTER PRIZE

Artika Patel was awarded the 'Best Student Oral Presenter' Prize for her presentation *Scanning Electron Microscopy Study of Root-End Cavities Following Laser Irradiation*.

KEYNOTE SPEAKERS

PROFESSOR MIKE MORGAN

School of Dentistry, University of Melbourne

Mike Morgan holds the Colgate Chair of Population Oral Health at The University of Melbourne. He graduated from the University of Otago with a BDS in 1979 and has worked predominantly at The University of Melbourne, School of Dentistry. His research interests include the prevention of oral disease in the community. He is currently Program Leader for Oral Health Informatics and Clinical Trials in the Cooperative Research Centre for Oral Health at The University of Melbourne. His other areas of interest within dentistry include undergraduate dental education and the legislative control of oral health care services.



PROFESSOR MARK C HERZBERG

School of Dentistry, University of Minnesota

Department of Diagnostic and Biological Sciences, University of Minnesota School of Dentistry, Director of the Mucosal and Vaccine Research Centre and directs the Graduate Program in Oral Biology and the NIH/NIDCR-supported Minnesota Craniofacial Research Training Program.

He maintains an active NIH/NIDCR-supported research program focusing on the molecular basis of infection. His current research program explores gene regulation in streptococcal biofilms, the structure and function of calprotectin as an innate intravascular antimicrobial and in the control of cell cycle, and mechanisms of primary HIV-1 infection of oral keratinocytes. The results of his research have been widely published in the peer-reviewed biomedical literature.



PROFESSOR ROSNAH ZAIN

Faculty of Dentistry, University of Malaya

A Professor in Oral Pathology and Oral Medicine since 2000, and currently the Deputy Dean for Postgraduate and Research as well as the Director, Oral Cancer Research and Coordinating Centre, Faculty of Dentistry, University of Malaya. She has published widely with her main area of research being oral mucosal lesions/oral cancer. Currently, she has a special interest in standardisation of various methodologic/clinical/pathologic criteria towards achieving credibility in all aspects of oral cancer research. She has been actively promoting research collaboration and training activities for some of the countries in the Asian region.



PROFESSOR KAZUHISA YAMAZAKI

Faculty of Dentistry, Niigata

Professor Yamazaki has published extensively in the area of the immunology of periodontal disease. He was amongst the first to demonstrate the regulatory NKT and T reg cells in periodontal dental tissues. His current research interests include the role of autoimmunity in periodontal disease progression and the relationship between periodontal and cardiovascular diseases.

Further information is available on the website:

<http://dentistry.otago.ac.nz/research/rd2009/researchday2009.html>

Faculty of Dentistry 3M Research Day 2010

The 2010 Faculty of Dentistry 3M Research Day was held on 1 April 2010 at the Hutton Theatre, Otago Museum.

BEST STUDENT ORAL PRESENTER PRIZE

Kimmy Lin was awarded the 'Best Student Oral Presenter' Prize for her presentation *Unravelling the Pathogenesis of Invasive Cervical Root Resorption*.

KEYNOTE SPEAKERS

ASSOCIATE PROFESSOR RANGSINI MAHANONDA

Department of Periodontology, Chulalongkorn University, Bangkok, Thailand

Rangsini Mahanonda's major research interest is in the critical role of innate immunity in periodontal disease. She has investigated how the non-immune innate cells, human oral epithelium and gingival fibroblast orchestrate the immune response to bacterial plaque products to keep homeostasis or result in disease expression. Her other research interests include the link between periodontitis and atherosclerosis and how periodontal infection is involved in the vasculature pathology and enhances plaque rupture.



MR FRANCIS SMITH

Department of Orthopaedic Surgery, University of California, San Francisco

Francis Smith's lifetime experience with a rare genetic craniofacial disorder (Treacher Collins syndrome) has led him to pursue a doctorate in craniofacial embryology at the University of California, San Francisco. Before he went to San Francisco, he studied craniofacial development at King's College. Outside of his laboratory, he is a pianist and violinist (despite his lack of hearing), an artist, a lover of antiques and an avid traveller.



PROFESSOR MAURO FARELLA

Department of Oral Sciences, Faculty of Dentistry, University of Otago

Mauro Farella's research is centred on the biomechanics of the masticatory system and the physiopathology of jaw muscles and temporomandibular joints. He has been working in research projects carried out at the University of Amsterdam, Copenhagen, Naples and Zurich. He is Professor of Orthodontics at the University of Otago, New Zealand. He has published over forty original articles in international peer-reviewed dental and non-dental journals and lectured in many countries.

Further information is available on the website:

<http://otago.ac.nz/sjwri/researchday/rd2010/researchday2010.html>



Acknowledgement

On behalf of the Sir John Walsh Research Institute, we would like to thank Professor Murray Thomson for his careful scrutiny of the text of this report.



