



UNIVERSITY OF OTAGO
FACULTY OF DENTISTRY
**SIR JOHN WALSH
RESEARCH INSTITUTE**
TE POKAPŪ RAKAHAU OTĀ JOHN WALSH

Research Report 2011-12

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The Sir John Walsh Research Institute, a Research Centre of the University of Otago, advances research and increases knowledge for the improvement of oral health in New Zealand. Its innovative, future-focused, interconnected research programmes cover the spectrum of oral health research, from the molecular level through biological systems to the health of populations. The Institute is part of New Zealand's only Faculty of Dentistry and its members have well-established productive collaborations across the University and with other institutions in New Zealand and worldwide. Among its research objectives is to develop clinical research that translates discoveries into measurable health improvements, and to maintain fundamental research that underpins teaching.

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We hope you enjoy this Research Report of the Sir John Walsh Research Institute, a full account of our research activities and achievements for 2011-12. Further details on our research programmes, activities and outputs are available from our website <http://sjwri.otago.ac.nz>, and individual researcher profiles are accessible through the University of Otago Division of Health Sciences' searchable Research Expertise database: www.otago.ac.nz/healthsciences/expertise.

Dr James Smith

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Introduction from the Dean



It is an honour to write this introduction to the third Research Report of the Sir John Walsh Research Institute. The Institute within the Faculty of Dentistry at the University of Otago has now established itself as providing the research basis for all the professions of dentistry within New Zealand. Within this reporting period, the results of the latest Performance Based Research Funding (PBRF) round were released, the Institute became a recognised Research Centre of the University and a new Clinical Research Programme was established so as to reflect the growing clinical research effort within the Faculty.

The PBRF results were particularly impressive with Dentistry outperforming a number of the basic science departments within the Health Sciences and with eight A ranked staff, Dentistry was the sixth highest out of all academic units within the University. This magnificent effort is a reflection of the activity within the Institute and is a testimony to the changed ethos that the creation of the Institute has brought to research within the Faculty and to the hard work of the Director in assisting staff with their Evidence Portfolios.

The position of the Institute as the focus for dental research in New Zealand was further recognised by the University by making the Institute a Research Centre of the University of Otago. Relatively few groups were given such recognition and the fact that the Institute was recognised as such reflects the high standing of dental research and of dental researchers, not only within the University, but also nationally and internationally.

The Institute draws together the research strengths within the Faculty. Initially there were five Research Programmes – Biomechanics and Oral Implantology (including Dental Biomaterials, Oral Implantology and Forensic Dentistry), Dental Epidemiology and Public Health, Oral Molecular and Immunopathology, Molecular Microbiology and Dental Education Research. The structure of the Institute however, was always designed to be flexible and while these five programmes represented the research strengths which existed at the time the Institute was formed, they were not fixed and it was envisaged that new programmes would evolve as new research themes developed and as the needs of the professions, and of the country, changed. In this context therefore, it is very pleasing to see the creation of the new Clinical Research Programme within the Institute.

The Clinical Research Programme, headed by Associate Professor Mary Cullinan, was formed in late 2012. It aims to bring together clinical researchers and to foster clinical research within the school. An early initiative of this group is to establish a practice-based research network (PBRN), which will reach out to dental practitioners throughout New Zealand. PBRNs foster relationships between practitioners and academics by investigating research questions of relevance to daily clinical practice. The types of studies that are undertaken range from retrospective studies using dental records, observational studies of routine care, case-control studies, through to clinical trials. Discussions have already been held with Dr Frederick Curro of New York University regarding the NZ PBRN linking with NYU's PEARL Network (Practitioners Engaged in Applied Research and Learning) together with eVident in Australia and the Scottish PBRN, based in Dundee, with the view of forming a global network to carry out practice based clinical trials.

The future of the Sir John Walsh Research Institute now looks very bright such that the oral health, and hence general health, of all New Zealanders will be based on a firm research footing.

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

Gregory J Seymour AM FRSNZ
Dean, Faculty of Dentistry, University of Otago
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Report from the Director



As the only Faculty of Dentistry in New Zealand, we have been at the centre of dental research in this country for more than a century. Today, our staff and students continue to earn international acclaim in areas as diverse as immunopathology, oral implantology, dental public health, materials science, microbiology and forensic odontology, to name just a few. More than ever before, our researchers are collaborating beyond their traditional disciplinary boundaries and are sharing their expertise, experience and passion for discovery. This is evidenced by the hugely successful performance of the Faculty of Dentistry and its research arm, the Sir John Walsh Research Institute (SJWRI), in the recent Performance Based Research Fund round.

The Sir John Walsh Research Institute remains committed to supporting research excellence within the Faculty of Dentistry. However, building a successful research strategy depends on an understanding what is happening now and what we think future trends will be across the wider research landscape. With the highly advanced technology available today such research is becoming increasingly more collaborative, interactive and dynamic. Moreover, the complexity of today's research questions demands a move beyond the confines of our own disciplines and an exploration of complementary expertise from scholars in other fields. One example of our efforts in this context is the establishment of a new Research Programme, that of Clinical Research and in particular Practice-Based Research. Greatly facilitated by the University, who conferred the status of Research Centre to the SJWRI, we were able to establish this developing theme in addition to our five established areas of Research Strength (Biomechanics and Oral Implantology, Dental Epidemiology and Public Health, Education Research, Molecular Microbiology and Oral Molecular and Immunopathology). It should be emphasized, however, that while these themes are neither prescriptive nor exhaustive, they do offer current and future staff and students an insight into our established areas of research expertise.

Building a successful research strategy clearly also involves funding considerations. The current funding environment is becoming ever more competitive and complex. Hence, the resources to support our research and innovation now need to be derived from a multitude of sources and programs, including those of various levels of government as well as private sector partners and various not-for-profit agencies.

Additionally, there is an increasing political and financial investment in the idea of research as an economic driver. As the SJWRI is still largely dependent on competitive funding, it remains a challenge to create a sustainable resource base from all our funding sources. In a period of constrained public expenditure and reduced core funding for basic research, universities are understandably eager to present evidence of linkages between research and industry, as well as the larger goals of society. Our answer to these challenges has been to explore more vigorously the commercial application of many of our research ideas. However, we do recognize that approaches to solving such problems are not possible without a strong foundation in basic research, even if the linkages between innovation and such research appear to be indirect.

Much of the research conducted at the SJWRI depends on the involvement of both undergraduate and postgraduate students. Although the roles of students vary among research areas, the quality of the research that can be accomplished is frequently dependent on the calibre of the students conducting the research, as well as the support provided to them to enable their success. The greatest challenge for us is our outdated and overcrowded laboratory space. At all levels, the overall level of research improves as the number and quality of staff and students improves. Hence, to maintain and improve research excellence at the Faculty, it is critical to offer modern, optimally designed facilities for the conduct of such research. Continued delays in the acquisition of these will inevitably impact negatively on our performance in the future.

Finally, a renewed focus is required to increase access to, and dissemination of, research tools, data, and artifacts developed at the SJWRI for students and our professionals. We are now committed, with the support of the Division of Health Sciences, to exploring and engaging the use of new IT channels of communication and support, such as interactive web designs, material repositories, and open-source learning pools. These are exciting times for the SJWRI and the Faculty, and we look forward to working together with the broader University, as well as our allied professional bodies, to further dental research in New Zealand.

Professor Jules Kieser

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Sir John Walsh KBE



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 third 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, himself also a dental graduate. In recent times, some fifty years after its initial introduction, the MDS degree was replaced by the Doctorate in Clinical Dentistry (DClinDent) featuring a considerably expanded research component, thus increasing 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 inform specialist 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.

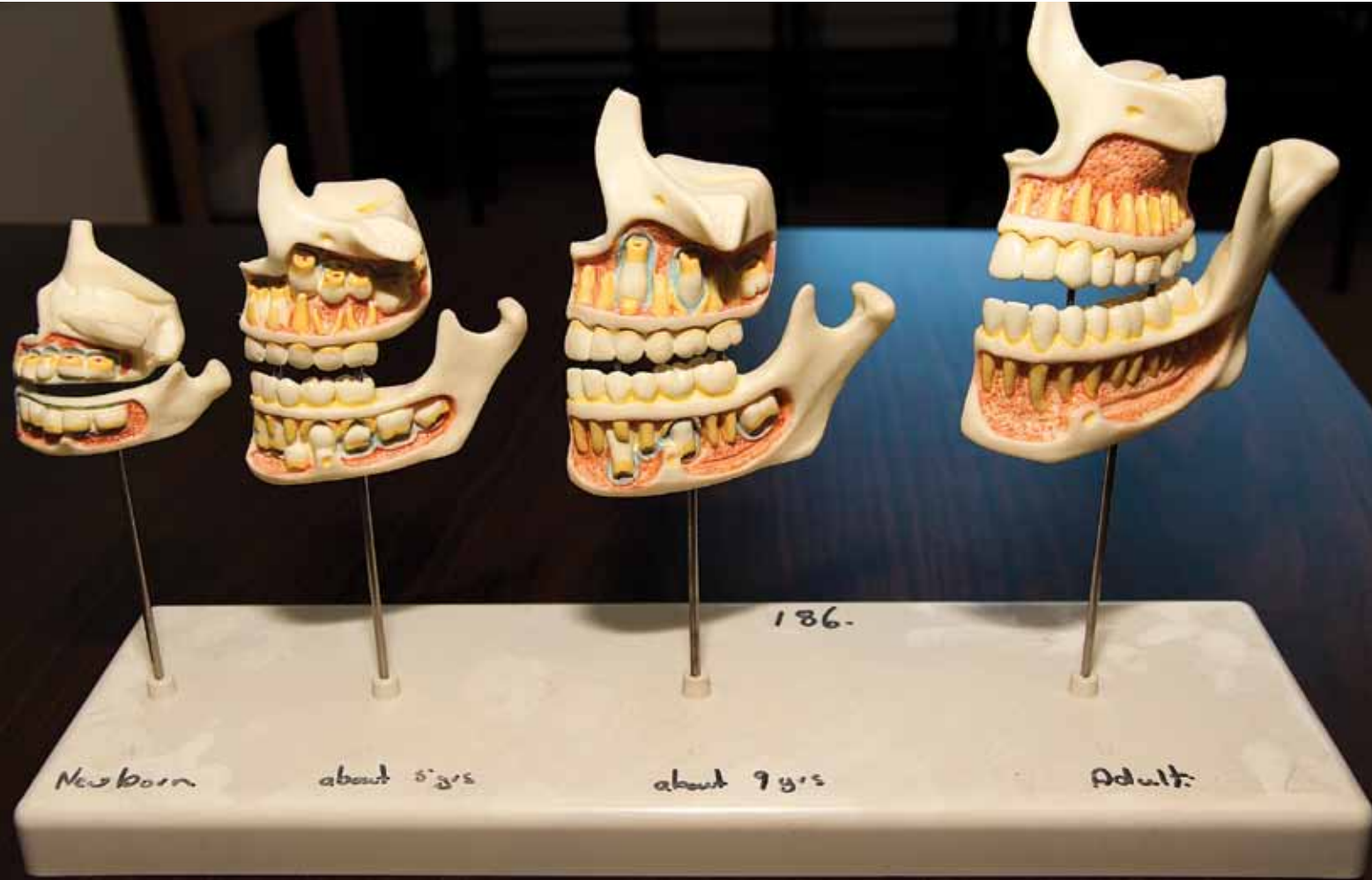
In 1952, Walsh's research on the air turbine handpiece ceased due to lack of funding. American and Swedish research had overcome the technical problems by about 1955 and, in 1957, the Borden Airotor was marketed by the Dentists' Supply Company. R.J. Nelson, who had produced a water- and powered cooled 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 within the Dental School in 1960, and supporting an electron microscopy suite, now reflected in the Otago Centre for Electron Microscopy. 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'.



Sir John Walsh, shown here at his desk at the Otago Dental School, 1940s. Hocken Collections, Uare Taoka o Hākena, University of Otago. (Reference S11-534d)



Research Highlights

PUBLICATIONS

DEPARTMENT	CATEGORY	2011	2012
Office of the Dean			
	Journal - Research Article	6.04	4.97
	Journal - Research Other		1.2
	Journal - Professional & Other Non-Research Articles	1	
	Conference Contribution - Published proceedings: Full paper	0.25	
	Conference Contribution - Published proceedings: Abstract	9.38	10.89
	Conference Contribution - Poster Presentation (not in published proceedings)	0.92	
	Conference Contribution - Verbal presentation and other Conference outputs	4.29	2.17
Office of the Dean (Dentistry)		21.88	19.23
Technical Services			
	Journal - Research Article		0.83
Technical Services			0.83
Oral Sciences			
	Authored Book - Research		1
	Chapter in Book - Research	2.33	1
	Journal - Research Article	35.61	45.28
	Journal - Research Other	1.7	6.73
	Journal - Professional & Other Non-Research Articles		1.5
	Conference Contribution - Published proceedings: Full paper		4.5
	Conference Contribution - Published proceedings: Abstract	19.86	31.38
	Conference Contribution - Poster Presentation (not in published proceedings)	3.65	1.1
	Conference Contribution - Verbal presentation and other Conference outputs	7.52	2.52
	Intellectual Property	1	
	Commissioned Report for External Body	0.5	
	Other Research Output		1
	Awarded Doctoral Degree	1	
Oral Sciences		73.17	96.01
Oral Diagnostic & Surgical Sciences			
	Journal - Research Article	14.97	7.77
	Journal - Research Other	0.83	1.33
	Conference Contribution - Published proceedings: Full paper		3.5
	Conference Contribution - Published proceedings: Abstract	6.72	8.87
	Conference Contribution - Poster Presentation (not in published proceedings)	0.57	0.18
	Conference Contribution - Verbal presentation and other Conference outputs	3.64	3.7
Oral Diagnostic & Surgical Sciences		26.73	25.35
Oral Rehabilitation			
	Chapter in Book - Research	1	
	Journal - Research Article	22.43	33.84
	Journal - Research Other	1.67	5.53
	Journal - Professional & Other Non-Research Articles		0.5
	Conference Contribution - Published proceedings: Full paper		2
	Conference Contribution - Published proceedings: Abstract	10.04	11.16
	Conference Contribution - Poster Presentation (not in published proceedings)	6.03	0.18
	Conference Contribution - Verbal presentation and other Conference outputs	1.58	1.75
Oral Rehabilitation		42.75	54.96
Total for Faculty of Dentistry/Sir John Walsh Research Institute		164.52	196.38

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

RESEARCH FUNDING

Funder	AWARDED 2011		AWARDED 2012		COMBINED 2011-12	
	#	Value	#	Value	#	Value
Dentsply	1	\$3,133	2	\$2,250	3	\$5,383
Downie Stewart Fuller Scholarship	9	\$25,000	5	\$10,000	14	\$35,000
FORENZAO Charitable Trust	4	\$11,136			4	\$11,136
Health Research Council:						
- Programme*			1	\$1,020,000	1	\$1,020,000
- Feasibility Study	1	\$146,826			1	\$146,826
Lottery Health Research	1	\$13,467			1	\$13,467
Maurice & Phyllis Paykel Trust:						
- Project	1	\$10,000	1	\$8,000	2	\$18,000
- Travel	1	\$2,000	2	\$2,500	3	\$4,500
- Conference support			1	\$4,000	1	\$4,000
Ministry of Health:						
- Oral health self-care in adults			1	\$230,332	1	\$230,332
- CBG subcontract			1	\$43,478	1	\$43,478
NZ Dental Association:						
- Ministry of Health ORF	5	\$130,259	4	\$47,419	9	\$177,678
- NZDA Research Foundation	11	\$119,419	9	\$111,982	20	\$231,401
NZ Pharmacy ERF	1	\$12,250			1	\$12,250
OIL Proof of Concept	1	\$50,000			1	\$50,000
Otago Medical Research Foundation:						
- Jack Thomson Arthritis Fund			1	\$29,473	1	\$29,473
UMAT			1	\$65,121	1	\$65,121
UoO Centres			1	\$75,000	1	\$75,000
UoO Research Grants			5	\$138,679	5	\$138,679
Wishbone Trust			1	\$14,560	1	\$14,560
TOTAL	36	\$523,490	36	\$1,802,794	72	\$2,326,284

- number of contracts awarded

* SJWRI/Faculty of Dentistry project 'Oral Health to age 38' within HRC Programme 'The Dunedin Multidisciplinary Study of Aging and Risk for Chronic Disease' led by Prof Richie Poulton, University of Otago (awarded \$5.67M over five years in 2012)

NEWS AND EVENTS

2012 PERFORMANCE BASED RESEARCH FUND QUALITY EVALUATION

The SJWRI would like to thank all academic staff who contributed to the Faculty of Dentistry's success in the recent Performance Based Research Fund (PBRF) Quality Evaluation for 2012, which reveals the remarkable gains in research productivity achieved by our faculty and within the larger University sector since the PBRF exercise was last conducted in 2006.

The PBRF Quality Evaluation, carried out by the government under the auspices of the Tertiary Education Commission (TEC), examines the quality of research performance by all eligible academic and research staff in New Zealand Universities and other tertiary education organisations. The 2012 evaluation reveals that Otago has more than 700 individual staff graded as either 'A' or 'B' for the quality of their research. 'A' graded researchers are judged as possessing high international standing in their fields and 'B' as enjoying high national standing. Since the 2006 evaluation, Otago's number of 'A' staff has increased from 144 to 189, while numbers of 'B' staff have risen from 473 to 546. The University improved its score in all four Average Quality Score metrics used by TEC to evaluate quality of research personnel and outputs. Otago was ranked first among New Zealand universities in the measure of research quality weighted by its postgraduate roll, and second in the measure weighted by degree-level enrolments and higher. The University is also the only tertiary education organisation to be ranked in the top four in all four quality measures.

SUBJECT AREA RESULTS

The Subject Area of Dentistry increased its Average Quality Score significantly since the previous assessment, largely due to the contribution of academic staff in our Faculty who make up the vast majority (over 97%) of Dentistry researchers in New Zealand. Dentistry was ranked 11th of all 42 subject areas assessed by TEC, and is one of only eight subject areas to have 20% or more of its researchers ranked 'A'. This underlines the unparalleled strength in Dentistry research within our Faculty.

NOMINATED ACADEMIC UNIT RESULTS

The Faculty of Dentistry was ranked 21st of 48 Nominated Academic Units (i.e. departments, schools or other organisational groupings nominated by the host institution) at the University of Otago, with an AQS of 5.0, a marked increase on both the 2006 and 2003 assessments and above average for Otago NAUs. Of all NAUs in the Division of Health Sciences, the Faculty is ranked fourth (behind only University of Otago Christchurch, the National School of Pharmacy and the Department of Biochemistry) and is one of only three units in the Division to have increased its number of both 'A' and 'B' ranked researchers since the previous audit; in terms of full-time-equivalent staff members, the Faculty scored 8.02 'A's, 14.69 'B's and 18.53 'C's.



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SJWRI RESEARCH CENTRE RECOGNISED

Following a rigorous application process, The Sir John Walsh Research Institute became one of 14 groups to be formally designated as a 'University of Otago Research Centre' for at least the next five years, beginning November 2012.

Deputy Vice-Chancellor (Research & Enterprise) Professor Richard Blaikie said, "Each of these centres bring together many of our finest researchers in collaborative, multidisciplinary research platforms or programmes pushing the frontiers of knowledge in their areas."

A demonstrated commitment to reach out and engage with relevant sectors of the community, business and government was among the selection criteria for the centres.

"At Otago, we believe that it is important that our research activities can be translated into real-world benefits wherever practicable. This goal is much more likely to be achieved if researchers forge close links with the end users of the research and other interested external parties," he says.

The research the centres are undertaking covers a broad spectrum. It ranges from pursuing advances in atomic and optical physics that will underpin new technologies, through to exploring the development of colonial culture and how it has shaped New Zealand society. Two centres are conducting large programmes looking at key aspects of how New Zealand can become more sustainable, while others have a strong focus on helping to bridge gaps between science and society. A number of centres, including ourselves, are involved in world-leading health-related research, with the goal of ensuring findings can be translated into improved treatment of diseases and disorders. Areas of focus include brain health; cancer; cardiovascular disease; diabetes and obesity; lifecourse studies; infectious diseases; neuroendocrinology; and oral health.

The University of Otago is committing more than \$2.5M over the next five years to support the internationally outstanding work of its leading research centres. The funding from the University's Research Committee will supplement other grants and contributions from academic divisions over this period to support their world-class research activities.

SIR JOHN WALSH RESEARCH INSTITUTE RESEARCH DAYS

Research Day 2011



On Thursday 11 August 2011, the Sir John Walsh Research Institute held its fifth annual research day. Students, practitioners, and academics from around the world joined us for a day that celebrated the research accomplishments of the staff, students and friends of the Sir John Walsh Research Institute.

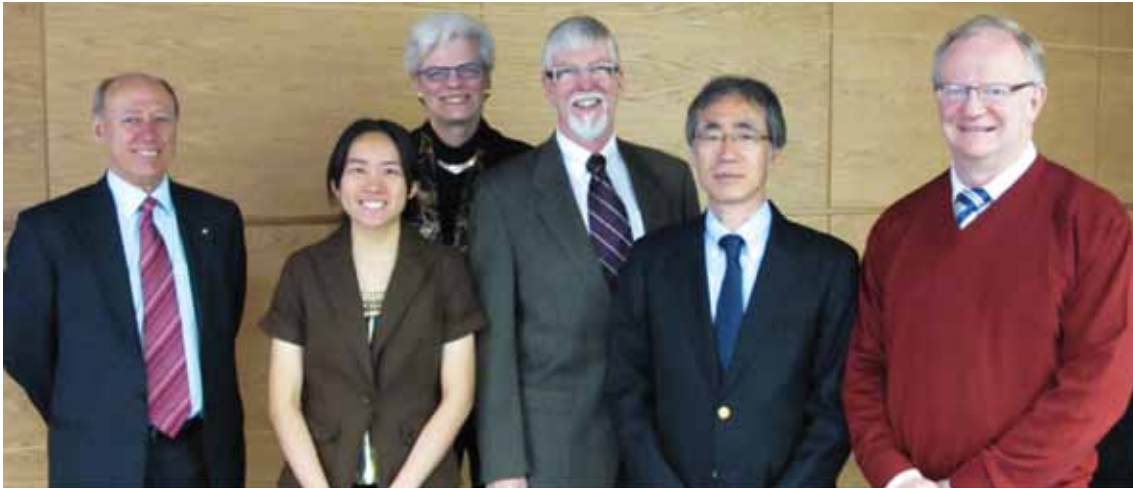
Keynote speeches were offered by:

Professor Dianne Rekow (NYU Senior Vice Provost for Science and Technology) – 'What compromises performance of all-ceramic crowns?'

Professor Van Thompson (Professor and Chair, NYU Department of Biomaterials and Biomimetics) – 'PEARL Practice Based Research Network Results: posterior composite restoration and dentin caries activity, noncarious cervical lesion treatment and endodontic treatment patient centered outcomes'

Professor Shinya Murakami (Professor and Chairman, Osaka University Department of Periodontology) – 'FGF-2 stimulates periodontal regeneration'

The Student Guest Speaker was our own Student Guest Speaker Grace Lee, winner of the 2011 Hatton Prize (Junior Category) from the International Association for Dental Research (see separate article). Grace's presentation was titled 'Inhibiting drug efflux pumps relevant to fungal infections and cancer: developing fluorescence assays of efflux'.



The award for best student speaker was won by Guy Farland, whose paper 'Under Pressure: Are We All The Same?' examined the pressures involved in swallowing for the first time. The international panel of judges praised Guy's work for 'pushing back the boundaries of science' and applauded its originality.

Research Day 2012

The 2012 edition of the annual SJWRI Research Day was held on Thursday 2 August in the Hutton Theatre, at the Otago Museum. Keynote addresses were delivered by:

Professor Deborah Greenspan (Professor of Oral Medicine, Leland A. and Gladys K. Barber Distinguished Professor in Dentistry and Chair, Department of Orofacial Sciences, School of Dentistry, University of California, San Francisco) – 'HIV/AIDS At Thirty Years'.

Professor John Greenspan (Associate Dean for Global Oral Health in the School of Dentistry at University of California, San Francisco) – 'Partnering for Global Oral Health'.

Steve Ting, Teaching Fellow, Centre for Science Communication, University of Otago – 'Science and Storytelling: How I gave up on tape measures and picked up a camera.'

The award for best student speaker was won by Sobia Zafar. Sobia's presentation, 'Effects of biphosponate on angiogenic gene expression in human gingival fibroblasts' highly impressed the national and international judges.

The Sir John Walsh Research Institute Research Days 2011 and 2012 were made possible by the generous support of 3M ESPE.

3M ESPE



Professor Deborah Greenspan



Professor John Greenspan

INAUGURAL NEW ZEALAND FORENSIC BIOMECHANICS SYMPOSIUM

Environmental Science and Research (ESR) and the Sir John Walsh Research Institute were proud hosts of the inaugural New Zealand Forensic Biomechanics Symposium held on Tuesday, 15 February 2011.

The symposium provided a welcome opportunity for members of the forensic biomechanics community to present their current research and plan for possible future collaborations. Guest speaker Dr David Baldwin, Director of the Midwest Forensic Resource Centre, Ames Laboratory, Iowa, opened the day's proceedings with a keynote presentation on the forensic scene in the United States.

In addition to being a valuable benchmarking exercise, the symposium provided an opportunity for forensic biomechanics students to present their results to an international forum.

Following the success of the inaugural event, highly successful SJWRI-ESR Forensic Biology Symposia were subsequently held in 2012 and 2013.



2011 SIR JOHN WALSH RESEARCH INSTITUTE AWARDS

The Sir John Walsh Research Institute Awards celebrate high quality research achievements and support within the Institute and the Faculty of Dentistry.

Postgraduate Publication Award: Mo'men Atieh (Biomechanics and Oral Implantology)

This award is for the best paper published or accepted for publication between 1 January 2010 and 31 December 2010 by a masters or doctoral student. Its purpose is to encourage young researchers completing their masters or doctorate to publish an article in a professional refereed journal that will enhance their research portfolios. The winner receives \$500.

Sir John Walsh Research Publication Award: Neil Waddell (Biomechanics and Oral Implantology)

This award is to recognise excellence in research by acknowledging the research calibre and effort required to produce a paper for the highest ranking journals of science or dentistry. The publication must have been accepted between 1 January and 31 December 2010. The winner receives \$1,000.

Research Support Award: Liz Girvan (Otago Centre for Electron Microscopy)

This award is to recognise the excellent support provided by general staff to research groups, units and/or departments within the Faculty of Dentistry. The winner receives \$2,000 towards attendance at a conference.



Liz Girvan with Andrew Tawse Smith of the SJWRI in the scanning electron microscopy suite of the OCEM, Department of Anatomy.

Basic Research Award: Dr Nicholas Heng (Molecular Microbiology)

The Sir John Walsh Research Institute, on behalf of the Faculty of Dentistry, wishes to acknowledge and promote basic research by a member of staff or postgraduate student in the Faculty of Dentistry. This award is to support a research development initiative that could make a contribution to the strategic direction of research within the Institute. The winner receives \$5,000 towards their continuing research.

Clinical Research Award: Associate Professor Warwick Duncan (Biomechanics and Oral Implantology)

The Sir John Walsh Research Institute, on behalf of the Faculty of Dentistry, wishes to acknowledge and promote clinical research by a member of staff or postgraduate student in the Faculty of Dentistry. This award is to support a research development initiative that could make a contribution to the strategic direction of research within the Institute. The winner receives \$5,000 towards their continuing research.

Sir John Walsh Research Award: Professor Richard Cannon (Molecular Microbiology)

The Sir John Walsh Research Institute, on behalf of the Faculty of Dentistry, wishes to acknowledge excellence in research over an extended period of time (more than 10 years) by a member of staff of the Faculty of Dentistry. The winner receives \$3,000 towards professional development.

ABOUT THE SIR JOHN WALSH RESEARCH AWARD WINNER

Professor Richard Cannon's research into the microorganisms that cause oral disease began more than twenty-five years ago, and has moved in some very surprising directions. What began as an exploration of the ways in which microorganisms adhere to saliva-coated surfaces in the mouth, leading to oral thrush and other, potentially more serious problems, has resulted in a groundbreaking technology platform that has wider implications for AIDS patients, cancer research, and veterinary medicine.

Professor Cannon, along with students and colleagues at the Faculty of Dentistry's Sir John Walsh Research Institute, has spent the last decade developing a novel way of introducing proteins from the pathogen *Candida albicans*, responsible for making the fungus resistant to antifungal agents, into common baker's yeast (*Saccharomyces cerevisiae*). This enables partners at research institutions around the globe to bombard the yeast cells with literally hundreds of thousands of compounds in a matter of days. This high-throughput screening (HTS) approach enables researchers to identify compounds with the potential to inhibit the resistance of *C. albicans* to antifungal drugs. The HTS has already identified hundreds of compounds with potential applications for patients who have received organ transplants or are suffering from AIDS, leaving them vulnerable to systemic fungal infections.

Professor Cannon and his team are currently conducting research to identify the most effective of the compounds they have discovered to date, while simultaneously looking at ways to adapt their technology to other fields of research. One avenue for further exploration is to apply the HTS methodology to tumours that have shown resistance to chemotherapy, looking for new drugs that can defeat these resistant forms of cancer. Another is in the agricultural industry, where resistance to the drenches used to treat sheep and cattle with intestinal worms is a multi-million dollar problem. His team is investigating whether their HTS platform can be used to discover drugs that will restore the potency of existing and well-trusted drenches for which resistance has developed.

Professor Cannon's work has been, and continues to be, a credit to the Sir John Walsh Research Institute, and we congratulate him on this award, which recognises his distinguished research contribution to both dentistry and the wider field of medicine.



CLEANING UP DENTAL DISPARITIES

University of Otago researchers seeking to develop ways to reduce chronic dental disease among Māori children will be doing so as part of an international initiative.

The project is a partnership between Māori, Indigenous Australians and First Nations Canada, under the umbrella of the International Collaborative Indigenous Health Research Partnership. The Health Research Council (HRC) is putting more than \$2.3 million in funding into the New Zealand part of the project.

Professor John Broughton, who is director of the University-based Ngāi Tahu Māori Health Research Unit, is lead investigator for the New Zealand research and is working closely with Professor Murray Thomson and Kate Morgaine in the Faculty of Dentistry. All three are affiliated with the SJWRI's Dental Epidemiology and Public Health research programme.

"Oral health disparities between indigenous populations and the rest of the population are a global thing," says Professor Broughton. "The cause is multifactorial. Diet, oral health behaviours, fluoridation, social determinants of health – those sorts of things."

Early childhood caries can become the focus of disease, pain and discomfort in the body, he says. "It can compromise their eating, their diet, and their behaviour. It can impact upon the quality of their life and impact on other members of the family."

The New Zealand research is being conducted in partnership with Tainui through their health provider, Raukura Hauora O Tainui, and the Waikato Tainui College for Research and Development, established by the late Sir Robert Mahuta.

"They are leading the project on the ground so it is all being done within their tribal area. They have the clinical facilities, while the college has the strong research kaupapa."

Professor Broughton points to some startling statistics when putting the case for such research in New Zealand. For example, Waikato District Health Board data on preventable hospital admissions for 2007 indicate that 12.8 per cent of admissions involving children aged up to four years were for dental reasons, making it the second highest cause. In the next age group (five–14 years) the figure for admissions due to dental problems jumped to 30.8 per cent, making it the highest cause in that age group.

The project is looking at New Zealand Māori mothers and their babies, and to safeguard the oral health of the mothers as well as that of the children.

"The thing about it is that all dental disease is preventable. And if you have a parent with poor oral health, and if you have a parent who has a high caries rate and a virulent strain of bacteria in their mouths they can infect their babies – just by kissing them."

By restoring and maintaining the oral health of the parents, and then other interventions along the way, it is hoped the babies can grow up without any oral pathology.

The researchers are currently recruiting 200 pregnant mothers for the five-year study who will be split into two randomised groups – an intervention group and a delayed intervention group so that all participants get the benefits of the interventions.

The intervention has two components: dental treatments for mothers and motivational interventions.

"It is called motivational and participatory guidance. It's not telling the participants what they should and shouldn't do; it's leading them into the position where they make those decisions themselves," says Professor Broughton.

"This is a good example of whānau ora. It's not just focused on the individual; it's focused on the family and the environment as well."

Reprinted with permission from *He Kitenga Māori*, University of Otago 2011



FILLING FIX WINS PAIR PROOF OF CONCEPT GRANT

Development of silver nanoparticle-based materials for treating dental caries won Dentistry Senior Lecturer Dr Don Schwass and Chemistry Lecturer Dr Carla Meledandri the 2011 Otago Innovation Proof of Concept Grant worth \$50,000.

Drs Schwass and Meledandri are together researching the application of silver-nanoparticles as a way to deliver and maintain antibacterial effects deep within the tooth. Their aim is to create a product that eliminates bacteria and prevents its recurrence under and around fillings. The Proof of Concept Grant will help fund their efforts to prove that these ultra-small nanoparticles are effective on teeth, as well as to conduct toxicity studies and then take the work to a stage that will interest dental materials manufacturers.

The project began with Dr Schwass's interest in new strategies for prevention of dental caries (tooth decay).

Dr Schwass felt the chemical compound silver diamine fluoride showed real promise, but when applied on teeth it leaves an unappealing black silver fluoride deposit on the cavity surface of carious lesions. A chance encounter at a speed-collaboration exercise for Otago academic researchers linked him with Dr Meledandri, who is interested in nanoparticles. In partnership, the pair have developed suspensions of silver nanoparticle-based materials which testing showed to have tremendously potent antibacterial qualities at very low concentrations. At these concentrations, the nanoparticle suspensions appear pale yellow in colour, or more often, completely colourless, solving the aesthetics problem.

In January 2013, with support from Otago Innovation Ltd, a provisional patent application was filed pertaining to the assembly of micelle aggregates of surfactant micelles and silver nanoparticles, and their use as an antibacterial agent. A suitable commercial partner is currently being sought to further develop this novel treatment into a marketable dental product.



PHD CANDIDATE GEMMA DICKSON RECOGNISED FOR PRESENTING THESIS OF EXCEPTIONAL QUALITY

SJWRI Forensic Biology PhD candidate Gemma Dickson was recognised in December 2012 by the University as having presented a thesis of exceptional quality. Gemma's thesis 'Microbial marine decomposition of human and animal remains', supervised by Associate Professor Russell Poulter of the Department of Biochemistry and Professor Jules Kieser of the SJWRI, was submitted in 2012. A thesis is of exceptional quality when all three examiners of a candidate's thesis agree that the thesis is among the top 10% of theses examined, and is of an exceptional standard in the areas of research content, originality, quality of expression and accuracy of presentation.

Gemma's PhD research investigated the involvement of marine bacteria in decomposition of human and animal remains in coastal marine environments. Surrounded by coastline, New Zealand sees an unusually high number of accidental and suspicious deaths occurring at or around the sea. Established methods that determine time of death for corpses on land, such as levels of decomposition or infestation by insects, aren't useful or informative for submerged bodies. Human remains in seawater are subject to a large number of decompositional factors, dependent upon the remains themselves and the specific marine environment. "Unless a body is witnessed entering the water, there is no reliable method for determining

the length of time that a body has been submerged," says Gemma, quoted in leading popular science magazine *New Scientist* in 2010. Marine bacteria appear to play an integral role in marine decomposition, though this process is poorly understood.

Gemma's research investigated whether the types of marine bacteria colonizing a body changes as it decomposes, serve as a postmortem 'clock', enabling determination of the length of time a body has been submerged in the sea, a critical factor that must be determined in any death investigation. Adult pigs' heads, used as an analogue for human cadavers, were submerged in Otago Harbour for up to three weeks, or until they were reduced to a bare skull, while sampling the bacteria on their decomposing skin was carried out every two to four days. To determine the effect of water temperature on bacterial colonisation, heads were submerged in autumn, early winter and late winter. Gemma found that stages of decomposition had different bacterial signatures. For example, for the heads submerged in winter, *Psychromonas* bacteria colonised during the first stages of decomposition, while specific *Bacteroidales* genera only colonised after 10 days of submersion. From this, a characteristic profile of bacterial genera could be established to infer time of entry into the water. Gemma's findings were published in leading forensics journal *Forensic Science International*, as well as being reported in national and international media.



POLICE COMMISSIONER AWARDS DARNELL KENNEDY

SJWRI PhD candidate Darnell Kennedy was honoured for an article which appeared in the *Australian Police Journal* in October 2012. The article "Forensic Dentistry and Microbial Analysis of Bite Marks" was published in March last year, winning Darnell first place in the education sector of the journal's awards.

In recognition of her achievement, Darnell was presented with a plaque and cheque by New Zealand Police Commissioner Peter Marshall at the Dunedin Central Police Station. "I thank you for what you have done, what you are doing now, and no doubt what you will go on to do," he told Darnell during the presentation.

Darnell says she has had a lifelong interest in law enforcement and developed a love for science-based research in early high school.

"I therefore consider myself extremely fortunate to be given the opportunity to perform research that encompasses both. But even more fortunate is the fact that I am under the guidance of three very supportive and nurturing supervisors, Professor Jules Kieser, Dr Geoffrey Tompkins and Dr Jo-Ann Stanton, to whom I credit much of my growth as a budding researcher."

Darnell commenced her PhD studies in 2009, looking at whether streptococcal DNA from a bite mark can be matched to DNA obtained from the teeth of the biter. Bite marks predominate in some of the most serious crimes, the most common of which are sexually motivated attacks and child abuse. Current conventional methods of analysing bite marks involve an element of subjectivity. The most objective mode of analysis involves the recovery of the biter's DNA from a bite mark. However, this is not often successful because enzymes in saliva degrade DNA. Oral streptococci are predominant colonisers of the tooth surface and are subsequently deposited in a bite mark. Past research suggests that individuals harbour their own unique collection of streptococci. Darnell's research was aimed at investigating whether streptococcal DNA from a bite mark can be matched to that obtained from the teeth of the biter, utilising a high-throughput DNA sequencing approach (the Roche 454 Genome Sequencer FLX instrument) to provide the DNA sequence data in which to make the comparisons. Darnell completed her thesis in late 2012. She donated the money she was awarded (\$500AU) to the New Zealand Forensic Science Society.



DENTAL STUDENT WINS TOP RESEARCH PRIZE AT INTERNATIONAL CONFERENCE

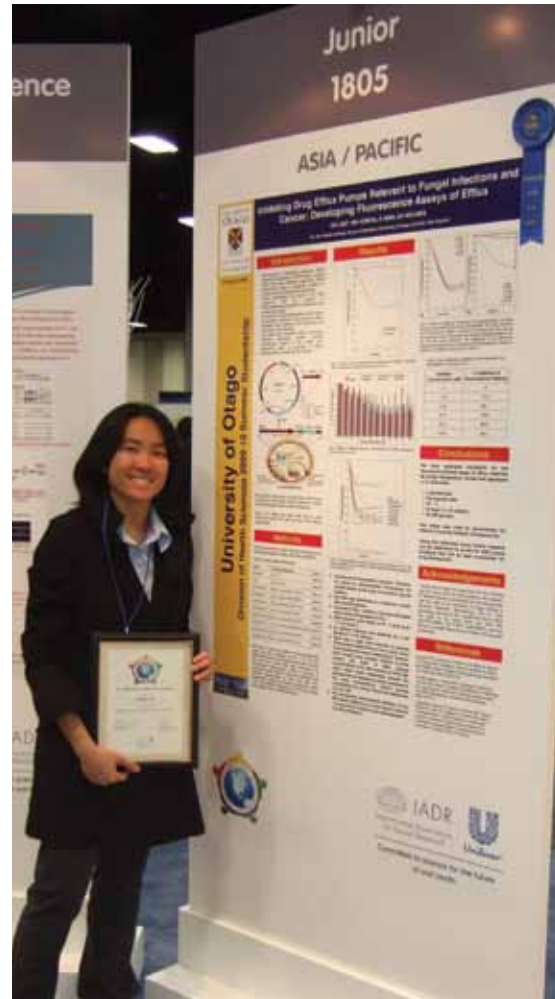
Fifth year dental student Grace Lee won first prize in the Hatton Competition (Junior Category) at the 89th General Session of the International Association for Dental Research (IADR) in San Diego, USA, March 2011.

Grace undertook a research project to investigate how drugs are pumped out of drug-resistant fungal cells. She developed a way of measuring pump function and used this to identify a pump inhibitor that could overcome fungal drug resistance.

Her research was selected by the New Zealand branch of the IADR to compete in the Australasian IADR poster competition in Kiama, Australia, in late 2010. She won that competition and received a travel grant from Unilever to enable her to compete in the Hatton Competition in San Diego. There she was up against the top dental students selected from North America, Latin America, Europe, Asia, Africa and the Middle East.

Her research was supported by a University of Otago Division of Health Sciences Summer Studentship, and funding from the NIH, USA, and the Foundation for Research Science and Technology. This marked the second time in four years that the Hatton competition has been won by a student from the Sir John Walsh Research Institute. Both Grace and the previous winner, Shilpa Raju, were supervised by Dr Ann Holmes within the Molecular Microbiology research programme.

Grace was awarded a plaque and a prize of US\$1,600.

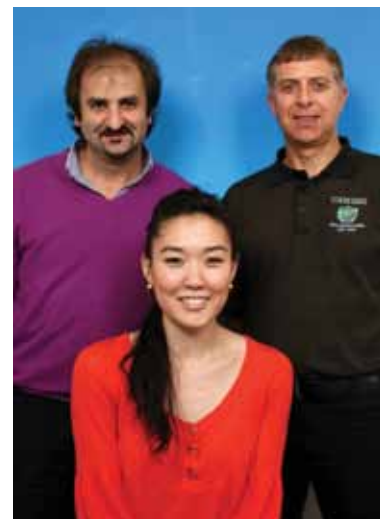


OTAGO STUDENT RECOGNISED AT IADR ANZ CONFERENCE

In September 2011 Inah Kim, a fifth year dental student, came runner up in the Colgate competition (Junior Category) at the Australia and New Zealand meeting of the International Association for Dental Research (IADR) in Melbourne, Australia.

Inah carried out a research project to describe three-dimensional mandibular growth using cone-beam computed tomography (CBCT). She developed an animal model system to superimpose 3D data sets and an initial 3D analysis of mandibular growth in a rabbit model. Her research was selected by the New Zealand branch of the IADR to compete in the Australasian IADR poster competition. She has been awarded a travel grant from Colgate to present her research in the 90th general session to be held in Rio de Janeiro, Brazil in June 2012. Here she will present her study amongst top dental students selected from North America, Latin America, Europe, Asia, Africa and the Middle East.

Her research was supported by a University of Otago Division of Health Sciences Summer Studentship, and funding from Education and Research Development Group (ERDG), from the New Zealand Association of Orthodontists (NZAO).



(Left to right) Professor Mauro Farella, Inah Kim, and Associate Professor Warwick Duncan.

IADR POSTER COMPETITION WINNERS 2011

The winners of the New Zealand section IADR student poster competition were announced at a small ceremony held on Thursday 19 May 2011. The judges noted that the standard this year was particularly high and, accordingly, four prizes were awarded. The winners are as follows:

Colgate prizes

The winners received \$2,000 from Colgate New Zealand to assist the students to represent the New Zealand section at the IADR Australian/New Zealand Division meeting to be held in Melbourne in September 2011.

Miss Inah Kim

Three dimensional evaluation of mandibular growth in rabbits

Supervisors: Dr W Duncan and Professor M Farella

Miss Huong Ho

Prenatal alcohol exposure's effects on the morphology and mineralization of mice's first molars

Supervisors: Dr R Napper, Professor J Kieser

IADR ANZ Division Travel Awards

The winners received \$700 towards registration and accommodation, plus return economy airfares, to present their work at the IADR Australian/New Zealand Division meeting in Melbourne.

Miss Doreen Ng

Neck and shoulder muscle activity during dentistry-related postural tasks

Supervisors: Dr C McNee, Professor J Kieser, Professor M Farella

Miss Debra Li

Negative pressure, cavitation effect and swallowing

Supervisors: Professor J Kieser, Professor M Swain, Dr Chris Bolter



(From left to right) Inah Kim, Associate Professor Nick Chandler, and Huong Ho.

IADR POSTER COMPETITION WINNERS 2012

The following students won grants to support their attendance and compete at the IADR ANZ Division's 52nd Annual Conference, held in Denarau, Fiji, in September 2012.

IADR NZ Section Colgate Poster Competition

Postgraduate – Mr Ben Seo, Endoplasmic reticulum stress and Russell bodies in periodontal inflammation

Undergraduate – Miss Ceridwen Benn, Identifying individual possums using their oral bacteria.

IADR ANZ Division Travel Grant

Miss Fiona Firth, Regulation of immune cells in lichen planus.

OTHER STUDENT AWARDS AND HIGHLIGHTS

Hannah Jack

was awarded an Advance Ashburton Community Foundation Special Award in March 2011. At the time of the award Hannah was a second year Doctorate of Clinical Dentistry student, specializing in Orthodontics.

Advance Ashburton Community

Foundation is a charitable trust which aims to improve health and education in the Ashburton region, as well as support the arts, sports and cultural groups, and a number of other charitable causes. The scholarship was awarded to Hannah as she grew up in the Ashburton area, and is currently undertaking post-graduate study in the Health Sciences area. The scholarship will be put towards orthodontic instruments and textbooks required for her course. Hannah undertook a research project as part of her doctorate investigating the role of lip pressures in orthodontic relapse of the lower anterior teeth.

Following completion of her DClintDent in 2012, Hannah was awarded the John McDonald medal for having the highest overseas mark in the Membership in Orthodontics (MOrth) examination in 2012. This examination is run by the Dental Council of the Royal College of Surgeons of Edinburgh, with those passing the exam being granted acceptance to the College. There are





a number of sittings of these exams, one in Edinburgh, Adelaide (which Hannah sat), Hong Kong, Dubai and Cairo, and Hanna scored the best mark from these overseas exams. As part of the assessment procedure Hannah was expected to submit some of her own orthodontic cases as well as being examined on other orthodontic topics.

Stephanie Ting, a Bachelor of Dental Technology with Honours student, was awarded an Electron Microscopy Student Research Award in June 2011. Two representatives of the OCEM User Group and two representatives of the OCEM Management Committee met to judge the 2011 EM Student Awards. Nine applications were received by the selection panel, and owing to the high standard of applications, two awards were allocated. Stephanie's project is entitled "The influence of a metal conditioner on the bond strength and residual stress of a porcelain-fused-to-metal system". The Award provides Stephanie with up to 15 hours electron microscope usage.

Daniel Sundaresan, a final year BDS student, won first place in the Otago Medical School Research Society (OMSRS) student speaker awards held on May 9 2012. Daniel carried out his research on a Summer Scholarship and was supervised by Nick Heng, Mary Cullinan and Bernadette Drummond.

Also in May 2012, **Dr Michael Tholey**, our first PhD student in Dental Technology visited the Faculty as part of the cooperation Vita Zahnfabrik has with the members of the Biomaterials discipline as headed by Professor Michael Swain. Dr Michael Tholey is employed in the Research and Development department of leading dental technology firm Vita Zahnfabrik, Germany.

Sajal Shah, a forensic biology Masters student in Forensic biology supervised by Prof Jules Kieser in the SJWRI, was awarded the AFTE Prize in July 2012. The Association of Firearm and Tool Mark Examiners (AFTE) is an international organisation who support forensic science students by awarding US\$2000 annually. Sajal Shah was chosen based on her academic transcript, reasons for pursuing a career in forensic science, contributions made to the field of forensic science and finally, recommendations by academic advisors and employers.

Following her award as best student speaker at SJWRI Research Day 2012 (see separate story), Oral Molecular and Immunopathology PhD student Sobia Zafar won the Colgate Senior Category Runner Up Award for her poster presentation at the 52nd Annual Meeting of the IADR Australia & New Zealand Division, which was held in Denarau, Fiji in September 2012.

Research Programme Profiles

BIOMECHANICS AND ORAL IMPLANTOLOGY

Programme Directors: Professor Michael Swain and Professor Jules Kieser

Clinical dentistry combines rules on evaluating and choosing different technologies, knowledge about oral function, materials and designs, together with experience of what works and what does not. However success depends greatly upon an understanding of the scientific basis of the constituent parts of the system.

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.

Research excellence increasingly relies on partnerships both with industry and funding organizations. Although the SJWRI has an excellent track record in this regard, there are several exciting new opportunities for partnerships that need to be developed in the coming years to help advance research excellence in the field of Oral Implantology and Biomaterials. In this regard, our researchers have focused on:

- Developing international partnerships for defined areas of enquiry
- Creation of new partnerships for research across the university
- Facilitation the commercialization of our ideas
- The development of partnerships with other New Zealand institutions necessary to make our research successful

- Expanding research capacity by acquisition of the latest instrumentation needed for such research.

Excitingly, there is no end in sight to the ongoing technological revolution. Our researchers are actively engaged in developing new materials and processes for sustainable restoration of teeth and the jaws that house them. We are trying to establish new paradigms in implantology, orthodontics, forensics and restorative materials, and in so doing, accepting the dual challenges of an ageing population as well as a younger population with a massive dental decay rate. Nanoscience and microscience are redefining possibilities of examination and analysis of natural and synthetic materials. Our group is exploring fundamental properties of teeth and materials through advances in sensors, imaging and myriad other technologies.

Intellectual property, including the negotiations over who gets to reap the financial and other benefits from it, remains central to our thinking. Our conceptions of new and emerging technologies and the roles they play in the development of our profession are the exciting drivers of much of our research.

KEY PERSONNEL

Professor Mike Swain
 Professor Jules Kieser
 A/Prof Warwick Duncan
 Professor Mauro Farella
 Dr Neil Waddell
 Associate Professor Bernadette Drummond
 Dr Vincent Bennani
 Dr Lihong He (deceased)
 Ludwig Jansen van Vuuren
 Dr Li Mei

PhD students:

Momen Atieh	Andrea Coldea
Therese De Castro	Gemma Dickson
Rami Farah	Amanda George
Felicity Gilbert (Australian National University)	Sara Hanning
David Kieser	Erin Hutchinson (University of the Witwatersrand, South Africa)
Kai Chun Li	Anne-Christine Lindstrom
Carolina Loch Santos da Silva	Sunyoung Ma
'Reham Osman	Andrew Quick
Donald Schwass	Ajay Sharma
Allauddin (Dini) Siddiqi	Michael Tholey
Neil Waddell	Darnell Kennedy
Andrew Tawse-Smith	Yikun Wang
Diogo Zaniccotti	

STUDENTS/COLLABORATIONS

Prof Jules Kieser and others in this group has been collaborating with a number of researchers, including:

Prof Ewan Fordyce of the Department of Geology co-supervised **Ms Carolina Loch Santos Da Silva** (pictured) who as completed a PhD thesis on the dentition of modern and fossil Cetacea (dolphins). This research has resulted in the publication of three articles in top end journals in the field.



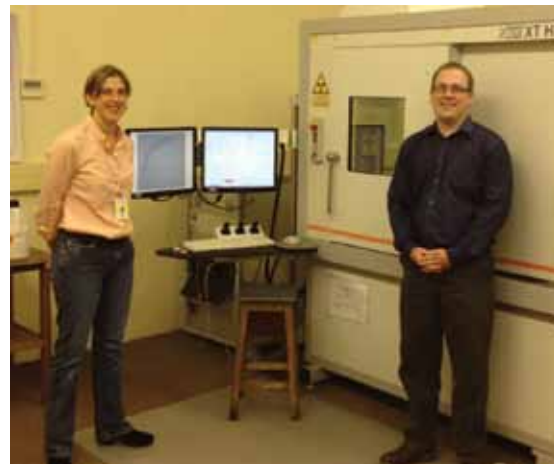
Prof Jean-Claude Theis of the Department of Orthopaedic Surgery, Dunedin School of Medicine, co-supervised **David Kieser's** PhD which focused on high velocity orthopaedic trauma. This research has already resulted in 5 publications and the award of the Dunedin School of Medicine Best PhD of 2013.



A/Prof Natalie Medicott of the School of Pharmacy co-supervised the PhD of **Sara Hanning** (pictured) who has focused her research on the development of an artificial saliva. The clinical application of this product to patients with severe xerostomia is currently being investigated in collaboration with Dr MaggieLee Huckabee of the Van DerVeer Institute, University of Canterbury, who is co-supervising Olivia Apperley's DCLinDent research.



Prof Beverley Kramer of the University of the Witwatersrand, Johannesburg, is co-supervising the PhD thesis of **Erin Hutchinson**, who is looking at the prenatal and early postnatal development of the human mandible. This research is being conducted using material from the RA Dart Collection and the advanced imaging facilities of the South African Nuclear Energy Corporation in Pelindaba. Erin is pictured with technician Kobus Hoffman at the micro-CT facility of the SANEC.



A/Prof Keith Probert, Marine Sciences and A/Prof Russell Poulter, Biochemistry co-supervised the PhD of **Gemma Dickson**, who studied the microbiology of marine decomposition. Not only was Gemma awarded a Tertiary Education Commission Top Achiever Award, but her thesis was selected by the University as being of 'exceptional quality', being in the top 10% of all doctoral theses submitted in 2012 (see separate article).



A/Prof Martyn Nash and the late Prof Andrew Pullan of the Department of Engineering Sciences, Auckland University together with Prof Oliver Rohrle of the Biomechanics and Mechanobiology Research Group at the University of Stuttgart, Germany, were involved in co-supervising **Yikun Wang's** PhD which centered on the biomechanical modeling of the human tongue during function. Yikun is pictured as a guinea-pig in his own research on tongue function, assisted by Nitin Raniga.



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.

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.

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.

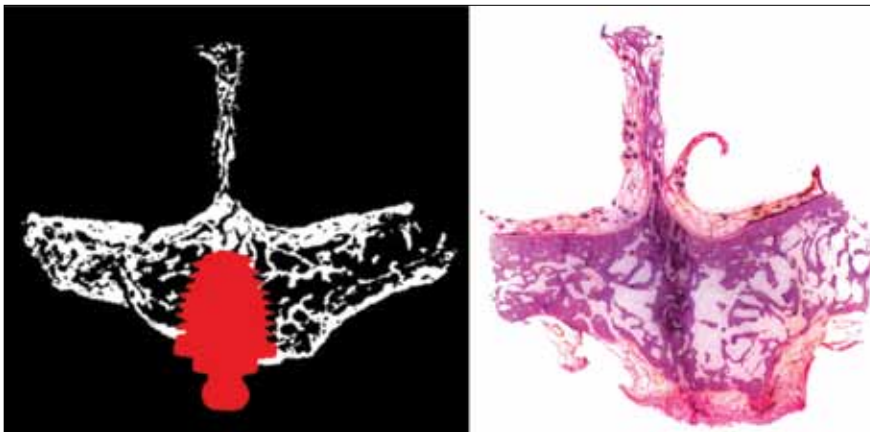
Sources of funding: New Zealand Dental Association Research Foundation, United States Department of Justice, ESR Capability Development Fund.

Activity 3. Implantology and associated superstructures

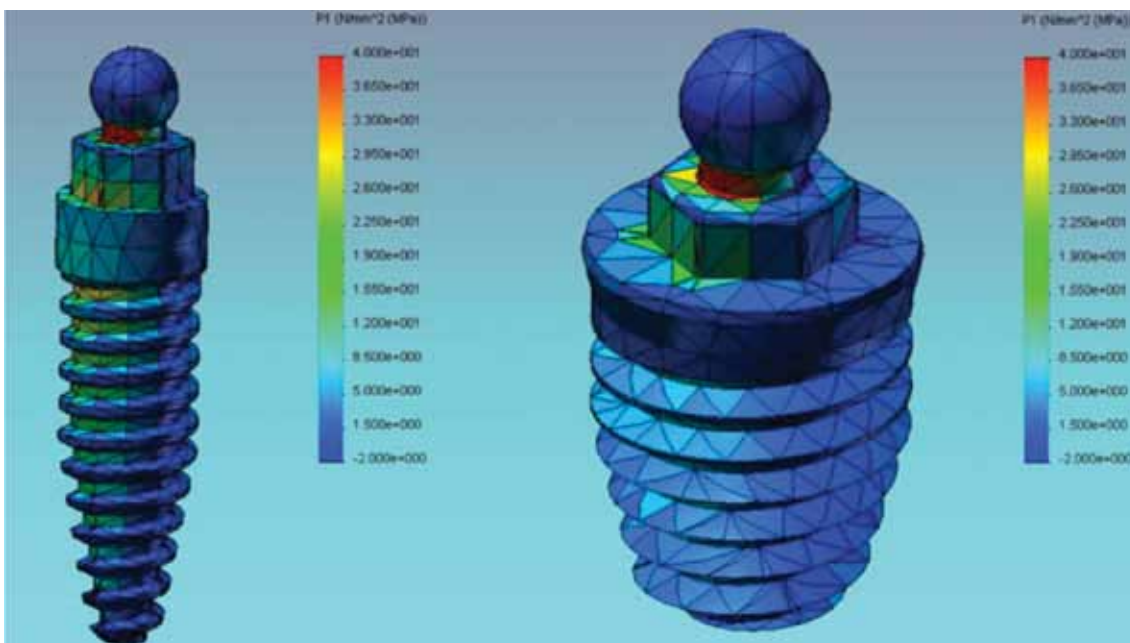
Description: Our research teams have expertise with respect to conducting clinical (human) and preclinical (animal) trials and laboratory-based research relating to oral implants. Currently, funded research is being conducted into different oral implant systems, materials, surfaces, superstructures, and surgical and restorative protocols, as well as supporting biological and regenerative products. Graduate student research during 2010-2011 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.



Micro-computerised tomographic image of human palate with superimposed silhouette of palatal implant (left) and histological images from the same site (right).Allauddin Siddiqi, PhD candidate.



First principal stresses in implants under oblique load on most distal implant on loaded side and on mid-palatal implant. Reham Osman, PhD candidate.

KEY PROJECTS AND FUNDING SUCCESSES

2012

New Zealand Lottery Grants Board Wireless monitoring of oral pH and bruxism. (Mauro Farella, Jules Kieser and Michael Paulin, Physics). \$49 500 (awarded 2013)

University of Otago Research Grant. Rush of blood to the head: Psychological factors in the analysis of bloodstain evidence (Jules Kieser with Rachel Zajac, Psychology and Michael Taylor, ESR) \$21,000.

University of Otago Research Grant. Merging anatomical and fluorescence molecular imaging to investigate craniofacial growth (Jules Kieser; Mauro Farella and Warwick Duncan) \$35,000.

University of Otago Research Grant. Periosteum under stress: The effects of denture-induced gingival pressure on bone resorption (Jules Kieser, Sunyoung Ma, Warwick Duncan and Michael Swain) \$ 32,768.

New Zealand Dental Research Foundation. The effect of seawater degradation on DNA from teeth (Sarah Drake, Jules Kieser, Warwick Duncan and Alison Rich) \$15,000.

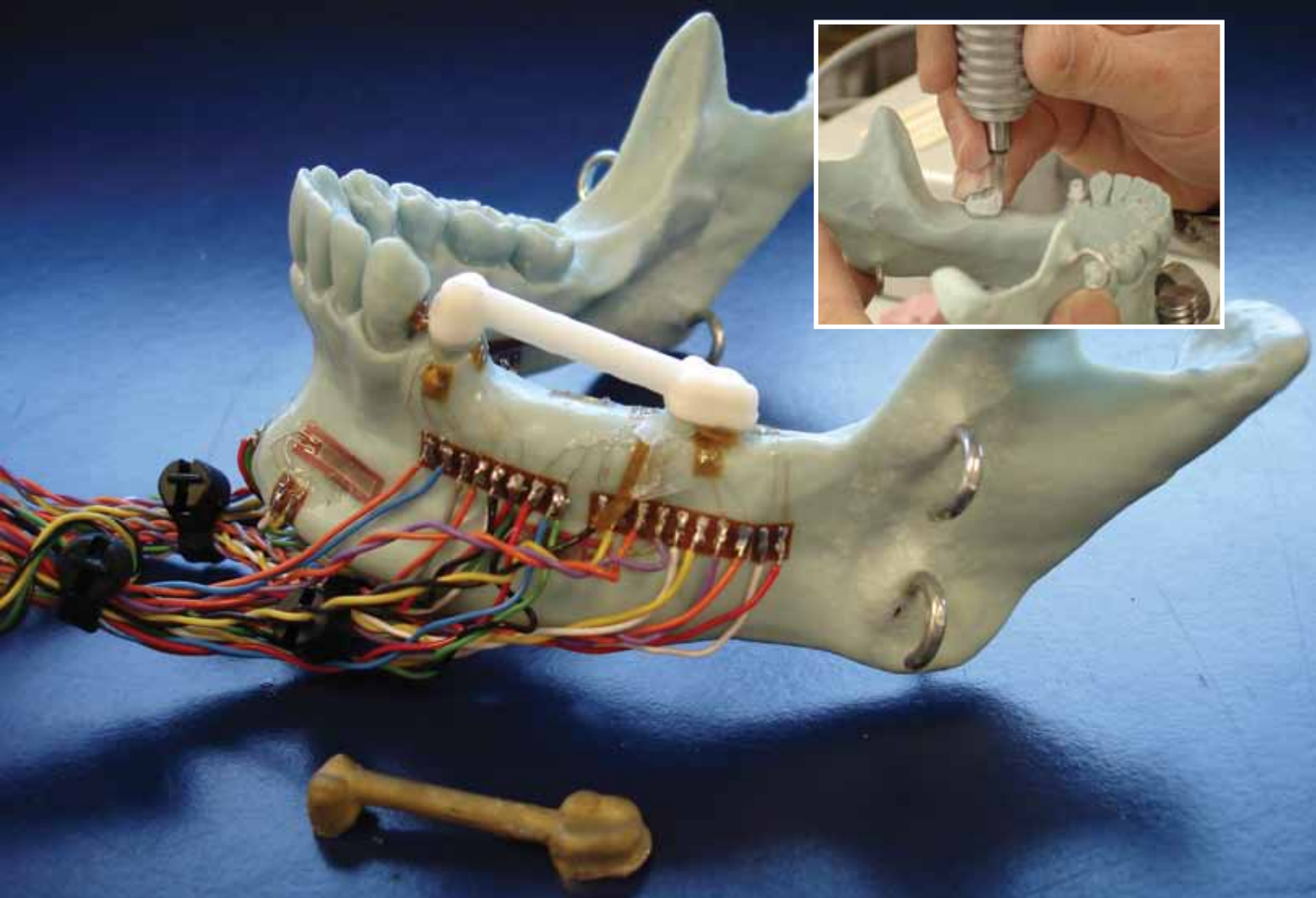
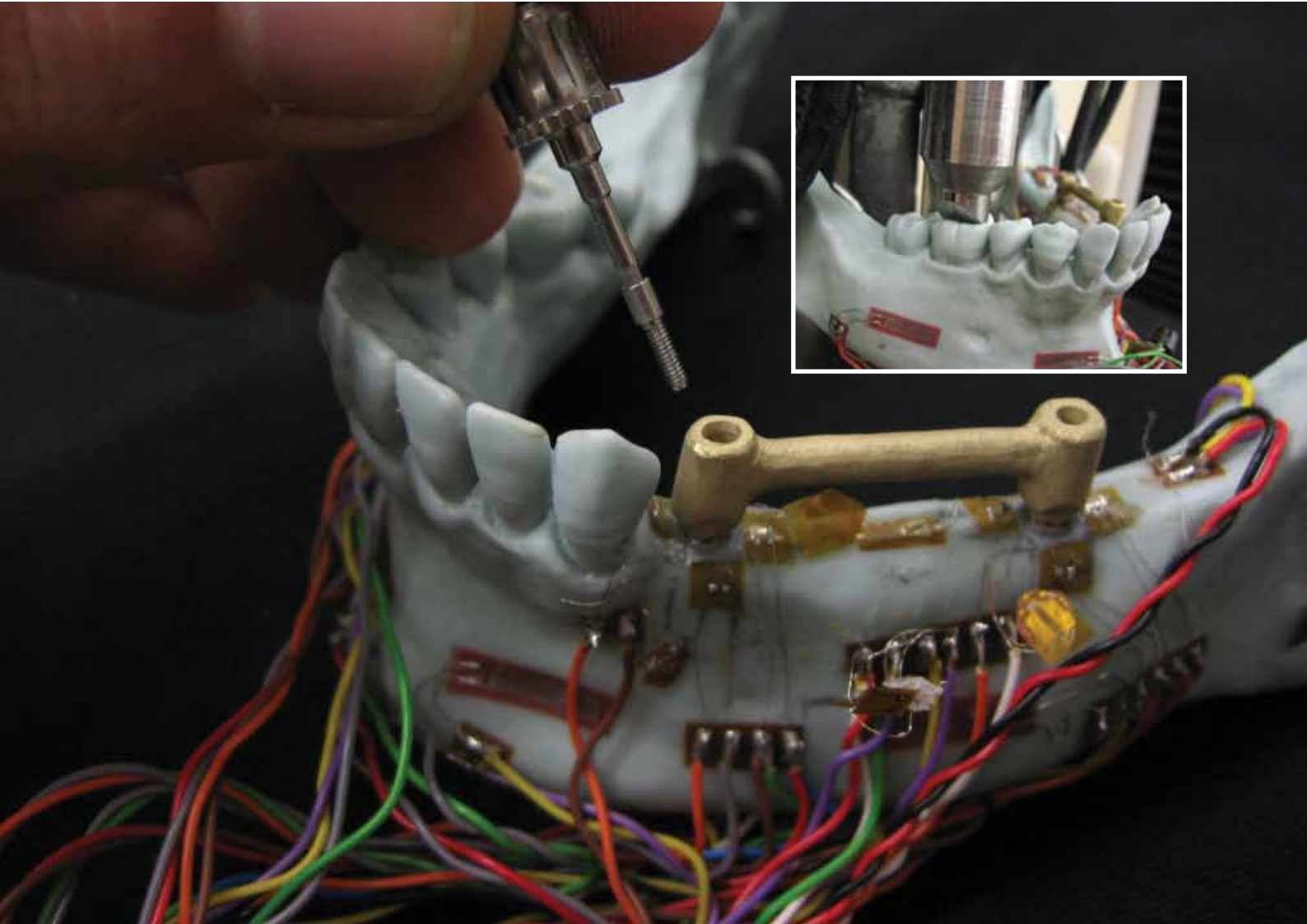
2011

National Institute of Justice USA. Development of a new model to study firearms related bloodspatter (Jules Kieser with Michael Taylor, ESR) US\$74,357.

Lottery Health Research Shared Equipment Grant. ARG-G2 magnetic bearing rheometer (E13/230861) (Programme members with Natalie Medicott and Thomas Rades) \$56,000.

New Zealand Dental Research Foundation. Continuous measurement of salivary pH using a novel indwelling wireless intraoral pH telemetry (Mauro Farella and Jules Kieser) \$15 000.

New Zealand Dental Research Foundation Continuing Dental Education Trust Research Award. Is the mid-palate of edentulous elders suitable for wide-bodied implants supporting over dentures? A histomorphometric and micro-computerised tomography study of human cadavers (with Allahoudin Siddiqi, Warwick Duncan, Jules Kieser and Rohana De Silva) \$7,000



DENTAL EPIDEMIOLOGY AND PUBLIC HEALTH

Programme Director: Professor W. Murray Thomson

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, in that 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 also conduct dental workforce research. We are also one of only three WHO Collaborating Centres in oral health in our particular WHO region; the other two are in Niigata (Japan) and Beijing (China).

KEY PERSONNEL AND COLLABORATIONS

Professor WM Thomson

Professor JR Broughton

Dr JM Broadbent

Ms DM Shearer (funded by an HRC programme grant; working on oral-general health)

Dr J Zeng (funded by an HRC programme grant; biostatistician; from 2013)

Dr LA Foster Page

Dr KC Morgaine

Our collaborations are very important to the work and impact of the group. Current collaborations include institutions in New Zealand (including Raukura O Hauora Tainui), Australia (the Universities of Adelaide and Melbourne), Canada (the University of Toronto), Japan (Osaka University), the USA (Duke University, the University of Michigan and the University of North Carolina), Britain (GKT Dental Institute, the University of London, Sheffield University, Dundee University), Chile (University of Chile) and Brazil (University of Santa Catarina, Florianopolis).

CURRENT RESEARCH

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: NZ HRC, US NIH, Otago Medical Research Foundation

Outcomes during 2011-12: Work in this area continues to attract international attention and to be published in the top international journals: 13 papers were published, and a number of conference presentations were made. The age-38 assessments were successfully completed for 95% of the surviving cohort. The funded aims of the dental research component for age 38 are: (1) to document the natural history of oral health and disease from childhood through to early midlife; (2) to determine the nature of the relationship of those conditions and associated SES inequalities with antecedent characteristics and exposures; (3) to investigate the relation between chronic periodontitis and cardiovascular risk; and (4) to identify gene-by-environment associations in oral health and disease.



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 2011-12: 13 papers were published.

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 2011-12: 25 papers were published (this total includes a number of clinical and educational research papers which 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 2011-12: successful postgraduate completions comprised seven Doctors of Clinical Dentistry and six Masters degrees. In addition, Dr JM Broadbent was a co-developer of the new BDS Honours programme Research Methods paper (DENT 580) in 2012.



2011-12 HIGHLIGHTS

Papers published and conference presentations made

In total, 50 papers were published in the peer-reviewed international scientific literature. The total number of conference presentations made was 34. Full details are available online

External funding secured

Approximately \$1.8 million (NZD) in external research funding was awarded to the Programme over the 2011-12 period. Of this, \$1.46 million was from the Health Research Council, while \$340,000 was secured in Ministry of Health research grants and contracts.

2012. Health Research Council of New Zealand – Programme Grant Extension. *The Dunedin multidisciplinary study of aging and risk for chronic disease.* To Professor WM Thomson, Professor Richie Poulton and Dr Nigel Dickson. \$5,665,540. 1 July 2012 to 30/06/2015. The dental project share of this grant is \$1,000,000.

2012. Ministry of Health Research Fund. *Living with dry mouth – Sjogren's syndrome patients' perspectives.* To Professor WM Thomson, Ms Joanna Ngo, Associate Professor Anita Nolan and Dr Shelagh Ferguson. \$NZ6,256.

2012. Ministry of Health Research Fund. *Dental professionals' experiences and perspectives on the provision of domiciliary oral health services for older adults.* To Professor WM Thomson, Dr Moira Smith (PI) and Associate Professor Kaye Roberts-Thomson. \$NZ14,000.

2011. Ministry of Health. *Improving oral self-care outcomes for at-risk adults.* To Professor WM Thomson (PI), Dr RP Fitzgerald (Anthropology) and Associate Professor JR Broughton (Social and Preventive Medicine). NZ\$264,881.

2011. Ministry of Health Research Fund. *A novel approach to caries management in children by resin infiltration.* To Dr L Foster Page (PI), Professor WM Thomson, MV Swain, D Schwass and AM Meldrum. \$NZ54,587.

2011. Health Research Council of New Zealand. *Oranga niho me ngā tangata whaiora: Oral health of Māori mental health patients.* To Professor JR Broughton, MG Lawrence, M Steinmann, M McGibbon, R Downs, J Nichols, B Laing, V Anderson. \$NZ293,000.

2011. Health Research Council of New Zealand. *A novel approach to caries management in New Zealand children.* To Dr Lyndie Foster Page (PI), Professor WM Thomson, Ms Dorothy Boyd and Dr Nicola Innes (University of Dundee). \$NZ146,826.

Postgraduate student completions 2011-12

Doctor of Clinical Dentistry: Guo Ling, Luke Adsett, Giselle D'Mello, Rohaida Abdul Halim, Lutfiya Al-Harathi, Praema Suppiah, Ali Ukra.

Master of Community Dentistry: Haji Amirul Rizan Bin Haji Mohamed, Victoria McKelvey, Angela Benn, Elizabeth Hitchings.

Other Masters: Yoganathan Ponnambalam, Jayaram Subramanian

Honours/awards

Lyndie Foster Page received the Young Investigator Award in Preventive and Community Dentistry from the Australia-New Zealand Division of the International Association for Dental Research in 2011.

Kate Morgaine was awarded the Sir John Walsh Research Institute Director's Award: Student Research Mentor Award in 2011.

Jonathan Broadbent was awarded the NZ Dental Association's Outstanding Young Dentist Award for 2011-12.



EDUCATION RESEARCH

Programme Director: Prof Tom Kardos

Research within this theme aims to contribute to knowledge and understanding of education, and to improve the quality of undergraduate and postgraduate educational experiences in the Faculty. A number of individuals have included research into aspects of education as part of their academic portfolios, in order to meet several of the University's core values and strategic imperatives i.e. achieving excellence in research and teaching in addition to facilitating outstanding campus environments and student experiences.

Dental Education Support Officer:

2011 Dr Vivienne Anderson

2012 Dr Janet Rountree

CURRENT RESEARCH PROJECTS

Prof. A. Rich, Dr J. Rountree, Prof. G. Seymour, (University of Otago), Dr D. Lekkas, A/Prof. T. Winning and Prof. G. Townsend, (The University of Adelaide).

Do multifaceted admission processes predict performance of students in two Australasian dental programmes? \$100,000

Dr S. Gallagher, Dr J. Rountree, Prof. B. Drummond, Dr J. Millichamp and Dr M. Stubbe, (University of Otago). University of Otago Teaching Development grant

Developing reflective practitioners through online video-based self-reflection. \$20,035

Dr V. Anderson, Dr P. Koopu, Mr G. Keay, Prof. A. Rich and Prof. J. Broughton: Ministry of Health Oral Health Research Fund grant.

Oranga niho, oranga tinana, oranga whānau: What are the implications of final-year dental student outplacements with Māori Oral Health Providers for students, hosts and whānau? \$24,988.

Dr S. Ma, Dr A. Tawse-Smith and Prof. M. Thomson. CALT *New model of geriatric dental education.* \$1,987.

Dr S. Ma, Mr K. Loke and Ms G. Hesson. University of Otago, Committee for the Advancement of Learning and Teaching.

A head in virtual reality: development of a 3D simulation mouth model. \$2,576.

PUBLICATIONS

He, L.-H., Foster Page, L. and Purton D. (2012). An evaluation of dental operative simulation materials. *Dental Materials Journal* 31: 645-649.

Subramanian, J., Anderson, V.R., Morgaine, K.C. and Thomson, W.M. (2012). Improving the quality of educational strategies in postgraduate education using student and graduate feedback: findings from a qualitative study in New Zealand. *European Journal of Dental Education*. Published online : 19 Sept. 2012, DOI: 10.1111/eje.12006

Subramanian, J., Anderson, V.R., Morgaine, K.C. and Thomson, W.M. (2012). Effective and ineffective supervision in postgraduate education: a qualitative study. *European Journal of Dental Education*. Published online: 12 Aug. 2012, DOI: 10.1111/j.1600-0579.2012.00774.x

Subramanian, J., Anderson, V. R., Morgaine, K. C. and Thomson, W. M. (2012). The importance of 'student voice' in dental education. *European Journal of Dental Education*. Published online : 12 Aug. 2012, DOI: 10.1111/j.1600-0579.2012.00773.x

Pang, L., Anderson, V. and Moffat, S. (2012). Initial University of Otago Oral Health graduates' employment pathways and preparedness for work. *New Zealand Dental Journal*, 108:83-88.

Anderson, V., Pang, L., and Aarts, J. (2012). New Zealand dental technicians and continuing education: Findings from a qualitative survey. *New Zealand Dental Journal*, 108:47-54.

Foster Page, L. A., Kang, M., Anderson, V. and Thomson, W. M. (2012). Appraisal of the Dundee Ready Educational Environment Measure in the New Zealand dental educational environment. *European Journal of Dental Education*, 16: 78-85.

Anderson, V., Kang, M. and Foster Page, L. (2012). First-year oral health and dentistry student perceptions of future professional work. *European Journal of Dental Education*, 16: e166-e173.

Moffat, S. and Kardos, R. (2012). New Zealand, Section 4. In, *A review of global literature on dental therapists*. Eds Nash, D.A., Friedman, J.W. and Mathu-Muju. K.R. Kellogg Foundation. Battle Creek, Michigan U.S.A. Pages 70-128.

Friedlander, L. and Anderson, V. (2011). A new predoctoral endodontic module: Evaluating learning and effectiveness. *Journal of Dental Education*, 75: 351-359.

Rich, A. M., Ayers, K. M. S., Thomson, W. M., Sinclair, R. J., Rohan, M. J. and Seymour, G. J. (2012). Does performance in selection processes predict performance as a dental student? *European Journal of Dental Education*, 16: 27-34.

Anderson, V., Rich, A. and Seymour, G. (2011). Undergraduate dental education in New Zealand: 2007-2009 final-year student feedback on clinical learning environments. *New Zealand Dental Journal*, 107: 85-90.

VISITING COLLABORATORS

Professor Brian Jolly, Faculty of Medicine, Nursing and Health Sciences, Monash University, Melbourne

Professor Andrew I. Spielman, Professor of Basic Science and Craniofacial Biology, New York University College of Dentistry

Dr Mary E. Williard, Dental Health Aide Therapist Education Director, University of Washington DENTEX Training Center.

Dr Heli Vinkka-Puhakka, Department of Oral Disease, Faculty of Dentistry, University of Turku, Finland.



MOLECULAR MICROBIOLOGY

Programme Director: 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 2011-2012, the Molecular Microbiology programme was funded from the following sources: the National Institutes of Health (USA), the Ministry of Education (China), the Marsden Fund of the Royal Society of New Zealand, the Foundation for Research Science and Technology, the Maurice and Phyllis Paykel Trust, the Ministry of Health Oral Health Research Fund, the New Zealand Dental Association Research Foundation, Otago Innovation Ltd, the Otago Medical Research Foundation, and the University of Otago Research Committee.

KEY PERSONNEL AND COLLABORATORS

Staff

Professor Richard Cannon
 Dr Nick Heng
 Dr Ann Holmes
 Dr Mikhail Keniya
 Dr Erwin Lamping
 Professor Robert Love
 Professor Karl Lyons
 Dr Li Mei
 Dr Brian Monk
 Dr Kyoko Niimi
 Dr Masakazu Niimi
 Dr Geoff Tompkins
 Mrs Jenine Upritchard

Postgraduate Students

Marina Mohd Bakri	Sujan Gowda
Leanne Hou	Franziska Huschmann
Darnell Kennedy	Nick Knight
Yeen Lim	Reza Shah Mansouri
Juhi Muthuplackal	Kate Newsham-West
Albert Nguyen	Yaya Othman
Bikiran Pardesi	Rohan Rodricks
Ely Rodrigues	Alia Sagatova
Don Schwass	Madhu Shankar
Wan Syasliza	Langley Tasmania
Varayini Yoganathan	

Visiting Scientists and students

Professor Bernhard Hube
 Hans Knoell Institute Jena (HKI) Jena, Germany

Professor Susumu Kajiwara
 Tokyo Institute of Technology, Tokyo, Japan

Dr Amarila Malik
 Universitas Indonesia, Depok, Indonesia

Professor Rajendra Prasad
 Jawaharlal Nehru University New Delhi, India

Professor Ted White
 University of Missouri, Kansas, USA

Dr Egija Zaura
 Academic Centre for Dentistry, Amsterdam

Ms Rouyu Zhang
 Tokyo Institute of Technology, Tokyo, Japan

External collaborators

Dr Stewart Bisset
 AgResearch, Palmerston North

Professor Henk Busscher
 University of Groningen, the Netherlands

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

Professor Susumu Kajiwara
 Tokyo Institute of Technology, Tokyo, Japan

Dr Kurt Lackovic
 Walter and Eliza Hall Institute, Melbourne, Australia

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

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 Thomas Tomasiak
UCSF, San Francisco, USA

Dr Keigo Ueno
Chiba University, Chiba, Japan

Dr Silas Villas-Bôas
University of Auckland, Auckland

CURRENT RESEARCH PROJECTS

There are several projects within the molecular microbiology programme.

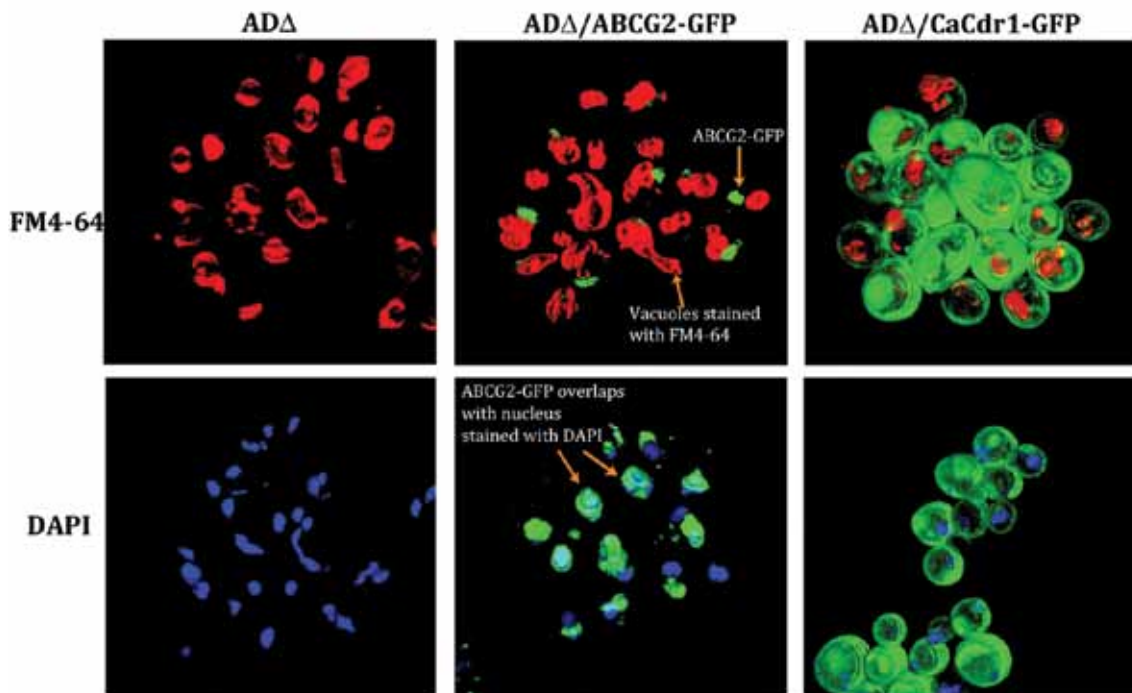
One project is investigating how periodontal bacteria acquire the haem they require for growth, as preventing this access may help prevent periodontal disease.

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 bacterial diversity associated with oral health and disease (severe dental caries and periodontal disease).

Next-generation DNA sequencing is also being used to sequence the genomes of two oral bacterial species: (i) an antimicrobial-producing strain of *Streptococcus salivarius*, and (ii) a strain of a new species, *Streptococcus trichosurus*, isolated from the oral cavity of the New Zealand-adapted brushtail possum *Trichosurus vulpecula*. The projects are currently in the genomic gap closure phase.



Human ABC transporter ABCG2 is located near the nucleus of yeast cells (DNA stained blue with DAPI) and is not in the vacuole (stained red with FM6-64). *C. albicans* ABC efflux pump Cdr1p is not associated with the nucleus or vacuole but is located in the plasma membrane (S Gowda, PhD student)

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 and parasitic nematodes.

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

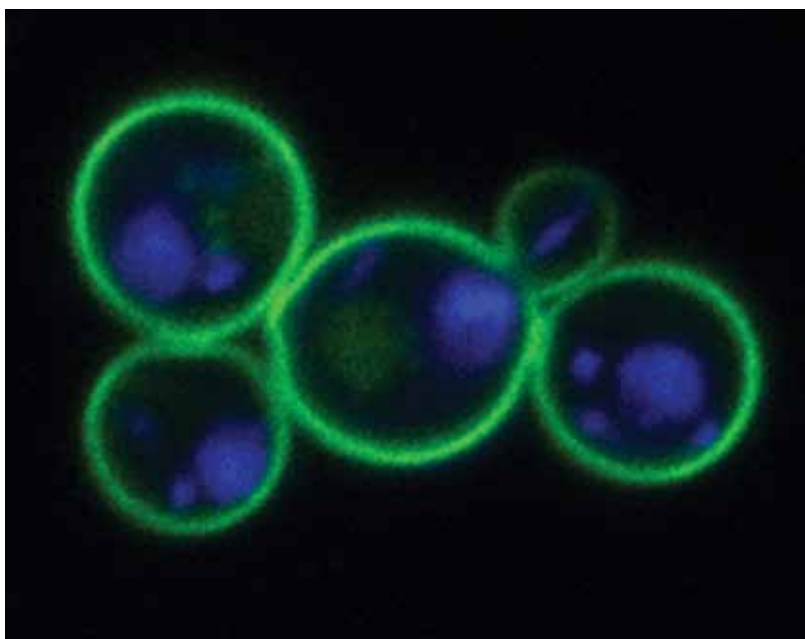
yeast strains so that they can be used for functional analysis and in high-throughput screening for drug discovery.

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.

In collaborations with researchers in the Netherlands and China, the adhesion of oral bacteria to orthodontic materials, and ways of improving oral hygiene in orthodontics patients, is being studied.

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.

X-ray crystal structure of recombinant enzyme lumazine synthase from the fungal pathogen *Candida glabrata* complexed with the product of catalysis. This enzyme is an essential component of the riboflavin biosynthetic pathway ifound in fungi and a potential drug target (Madhu Shankar, PhD student).



Yeast multidrug efflux pump Pdr5p (tagged with GFP) is located in the plasma membrane (DNA stained blue with DAPI; Dr M Keniya)

2011-12 HIGHLIGHTS

Student graduations

Marina Bakri (PhD, 2011)
 Leanne Hou (DClinDent, 2012)
 Karl Lyons (PhD, 2012)
 Reza Shah Mansouri (DClinDent, 2012)
 Albert Nguyen (PhD, 2011)
 Rohan Rodricks (DClinDent, 2011)
 Langley Tasmania (DClinDent, 2012)
 Manjula Weerasekera (PhD, 2012)
 Varayini Yoganathan (DClinDent, 2012)

Honours and awards

Ceridwen Benn (4th year dental student) won the International Association for Dental Research (IADR), New Zealand Section Colgate Poster Competition (2012)

Professor Richard Cannon: IADR, Australia and New Zealand Division, Alan Docking Science Award (2011)

Professor Richard Cannon: Sir John Walsh Research Award (2011)

Grace Lee (5th year dental student) won first prize in the Hatton Awards at the IADR General Session, San Diego (2011)

Dr Kyoko Niimi, SJWRI Basic Research Award (2010, awarded in 2011)

Dr Masakazu Niimi, Poster Prize, International Society for Human and Animal Mycology, 18th Congress, Berlin, Germany (2012)

Daniel Sundaresan (5th year dental student) won first place in the Otago Medical School Research Society (OMSRS) student speaker awards (2012)



X-ray crystal structure of recombinant enzyme lumazine synthase from the fungal pathogen *Candida glabrata* complexed with the product of catalysis. This enzyme is an essential component of the riboflavin biosynthetic pathway ifound in fungi and a potential drug target (Madhu Shankar, PhD student).



ORAL MOLECULAR AND IMMUNOPATHOLOGY

Programme Directors: Professors Greg Seymour and Alison Rich

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 cellular, molecular, immunological and pathological tools are employed including cell culture, genomic and focused micro-arrays, real-time PCR, laser microdissection and immunohistochemistry. In terms of periodontal disease the focus is on understanding the immunoregulatory control of chronic periodontitis and on epigenetics to determine the influence of environmental factors, such as tobacco smoking, on disease progression. The relationship with systemic diseases is being investigated as part of a multidiscipline international collaborative study, while the immunopathological mechanisms underpinning oral mucosal diseases are being investigated using single and double layer immunofluorescence and immunohistochemistry coupled with the use of focused micro-arrays to determine gene expression profiles. Of major interest is regulation of the local immune response in oral mucosal lichen planus and in oral squamous cell carcinoma and angiogenesis and the reaction to endoplasmic stress in carcinoma. The interest in angiogenesis also extends to pulpal tissues in terms of root development, as well as to the effect of bisphosphonates and the pathogenesis of Bisphosphonate Related Osteonecrosis of the Jaw (BRONJ). In collaboration with the oral implantology research group, immunohistology and gene expression approaches are being used to determine the effect of implant surface type and morphology on the osteogenic potential of adipose-derived stem cells as well as other cell types in culture.

KEY PERSONNEL AND COLLABORATIONS

Praveen Parachuru	Suraya Sinon
Dawn Coates	Avadhoot Avadhani
Stephanie Park	Diogo Zaniccotti
Olive Allsobrook	Trudy Milne
Mary Cullinan	Warwick Duncan
Norman Firth	Andrew Tawse-Smith
Lara Friedlander	Bernadette Drummond
Osea Gavidì	Alison Rich
Sharla Kennedy	Benedict Seo
Haizal Hussaini	Greg Seymour
Ramya Jawadi	Sobia Zafar
Lynda Home	Sarah Drake
Simon Guan	Muhammad Al-Ansary

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

In association with the School of Medicine 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 recognized as a world leader in using molecular and cellular techniques in longitudinal clinical trials.

CURRENT RESEARCH PROJECTS

Characterisation of natural regulatory T cells and Th17 cells in human periodontal disease and oral squamous cell carcinoma. H Hussaini, P Parachuru, D Coates, T Milne, M Cullinan, A Rich, G Seymour. Funding: \$36,905 NZDARF 2010-2012, \$12,444 OMRF 2010-2012

Endoplasmic stress in periodontal diseases and oral squamous cell carcinoma. B Seo, D Coates, A Rich, G Seymour. Funding: \$29,810 NZDARF 2010-2012

Regulation of the immune response in oral mucosal lichen planus. S Sinon, R Jawadi, F Firth, A Rich, G Seymour. Funding: \$14,981 NZDARF 2012

Human adipose-derived stem cells on titanium surfaces and the pathogenesis of peri-implantitis. D Zaniccotti, A Tawse-Smith, D Coates, W Duncan, G Seymour. Funding: \$14,397 NZDARF 2011-2013

The role of bisphosphates on gingival fibroblast gene expression. S Zafar, M Cullinan, G Seymour. Funding: \$58,660 NZDARF 2011-2012

Pulpal stem cells and angiogenesis in the pulp. L Friedlander, M Cullinan, D Coates, A Rich, G Seymour. Funding: \$14,867 NZDARF 2010-2012

Angiogenic factors in oral squamous cell carcinoma. O Allsobrook, A Rich, L Friedlander, P Parachuru, G Seymour. Funding: \$14,422 NZDARF 2012-2014

HIGHLIGHTS 2011-2012

Sept 2012

Fiona Firth won the Junior Category of the Colgate-Palmolive Award in Dental Research and Sobia Zafar was second in the Senior Category at the meeting of the Australia and New Zealand Division of the International Association of Dental Research in Fiji.

Aug 2012

Dr Benedict Seo won the International Association of Oral Pathology Oral Prize for his paper 'Endoplasmic reticulum stress and Russell bodies in periodontal inflammation' at the biennial meeting in Brazil.

July 2012

Olive Allsobrook and Benedict Seo were awarded 'Young Investigator Travel Awards' by the International Association of Oral Pathology for travel to the biennial meeting in Brazil.

July 2012

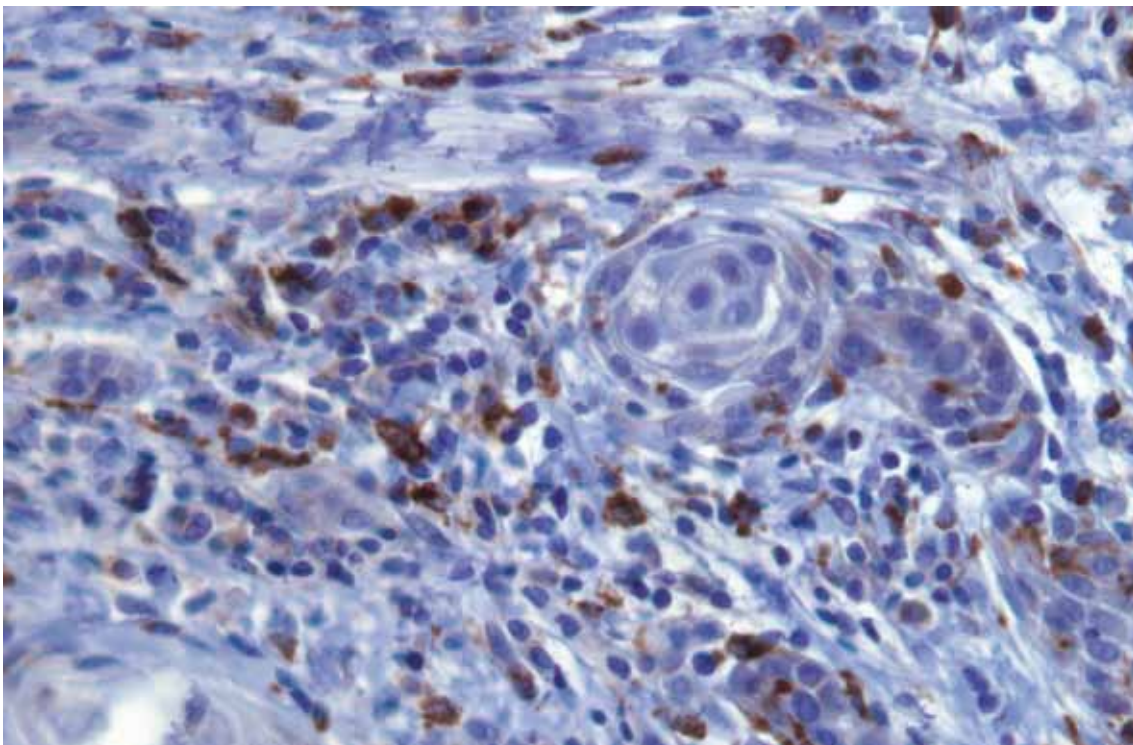
Dr Benedict Seo was awarded an Elman Poole Travelling Fellowship from the University of Otago to fund a visit to our collaborators in Malaysia to obtain experience with specific research techniques and collect additional research specimens.

June 2012

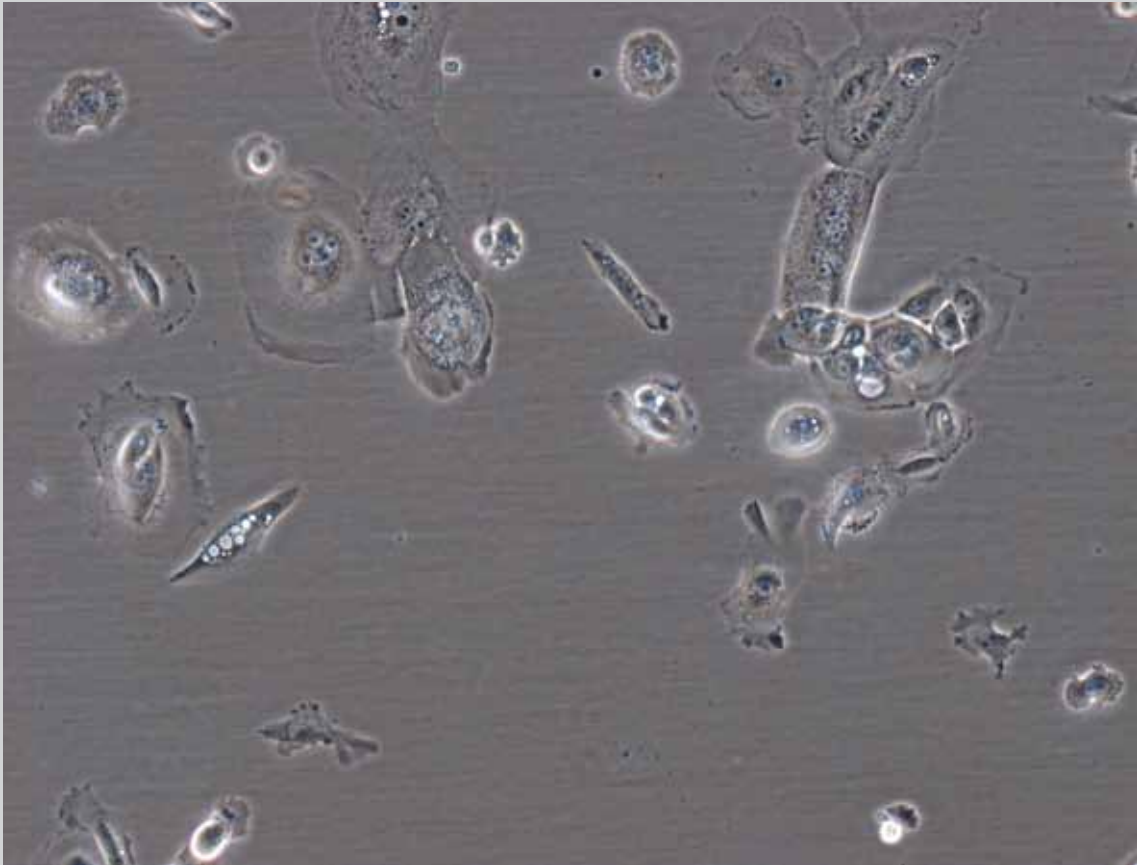
Associate Professor Mary Cullinan was appointed Chair of the International Association of Dental Research Awards Review Committee with responsibilities for judging the IADR/Unilever Hatton Competition and selecting recipients of the IADR/Colgate Research in Prevention Travel Award.



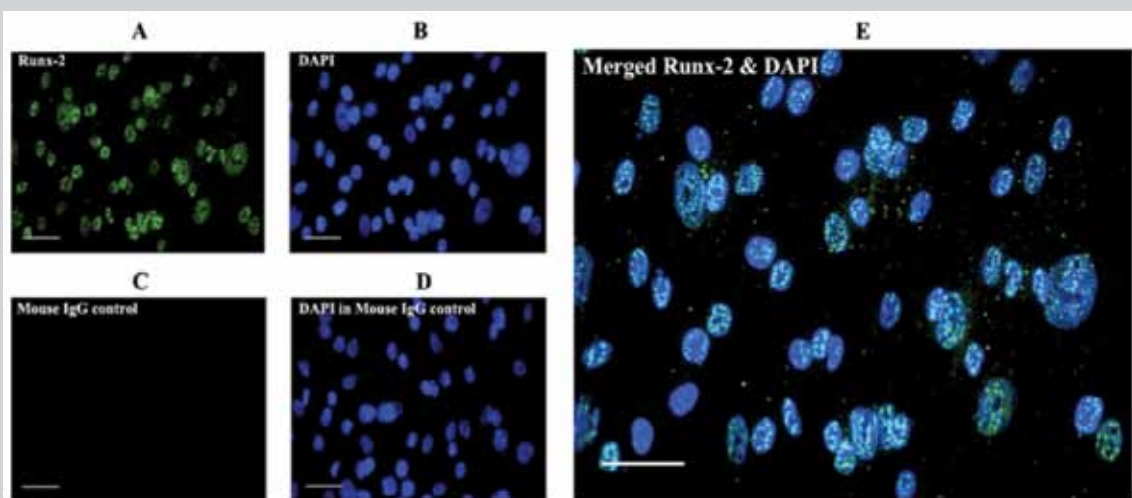
Greg Seymour, Ramya Javadi, Alison Rich and Praveen Parachuru gathered together to assess slides of oral mucosal lichen planus processed for immunohistochemistry with antibodies to IL-33.



Macrophages reacting with CD68 in the stroma adjacent to infiltrating squamous cell carcinoma islands in an assessment of the immune response in oral cancer being undertaken as part of Avadhoot Avadhani's PhD project



Squamous cell carcinoma cell line cultured as part of Benedict Seo's PhD project prior to stimulation with tunicamycin to induce endoplasmic reticulum stress.



Adipose-derived stem cells cultured by Diago Zanicotti in serum-free and osteogenic media expressed Runx-2 at 7 days on rough and smooth titanium surfaces. Expression of Runx-2 at 7 days on smooth titanium and serum-free media. Scale bar = 25 μ m.

CLINICAL RESEARCH

AN EMERGING RESEARCH PROGRAMME OF THE SJWRI

Programme Director: Associate Professor Mary Cullinan

In late 2012 The Sir John Walsh Research Institute was successful in its application as a Research Centre within the University of Otago. This has enabled us to set up a Clinical Research Programme (CRP) within the Institute. The Clinical Research Programme aims to bring together clinical researchers and foster clinical research within the school. One of the first initiatives of the CRP is to develop a Practice Based Research Network (PBRN), which will reach out to dental practitioners throughout New Zealand. PBRNs foster relationships between practitioners and academics by investigating research questions of relevance to daily clinical practice. The types of studies that may be undertaken range from retrospective studies using dental records, observational studies of routine care, case-control studies, through to clinical trials.

PBRNs have been successfully operating in a number of countries in recent years. For example, the US has the National Dental Practice-Based Research Network with a mission 'To improve oral health by conducting dental practice-based research and by serving dental professionals and their patients through education and collegiality'. Research carried out through PBRNs in the US has examined a range of topics including outcomes of cracked teeth and of single tooth endodontic and restorative treatment, repair or replacement of defective restorations, remineralisation of white spot lesions following removal of orthodontic brackets, and medications and dry mouth among others.

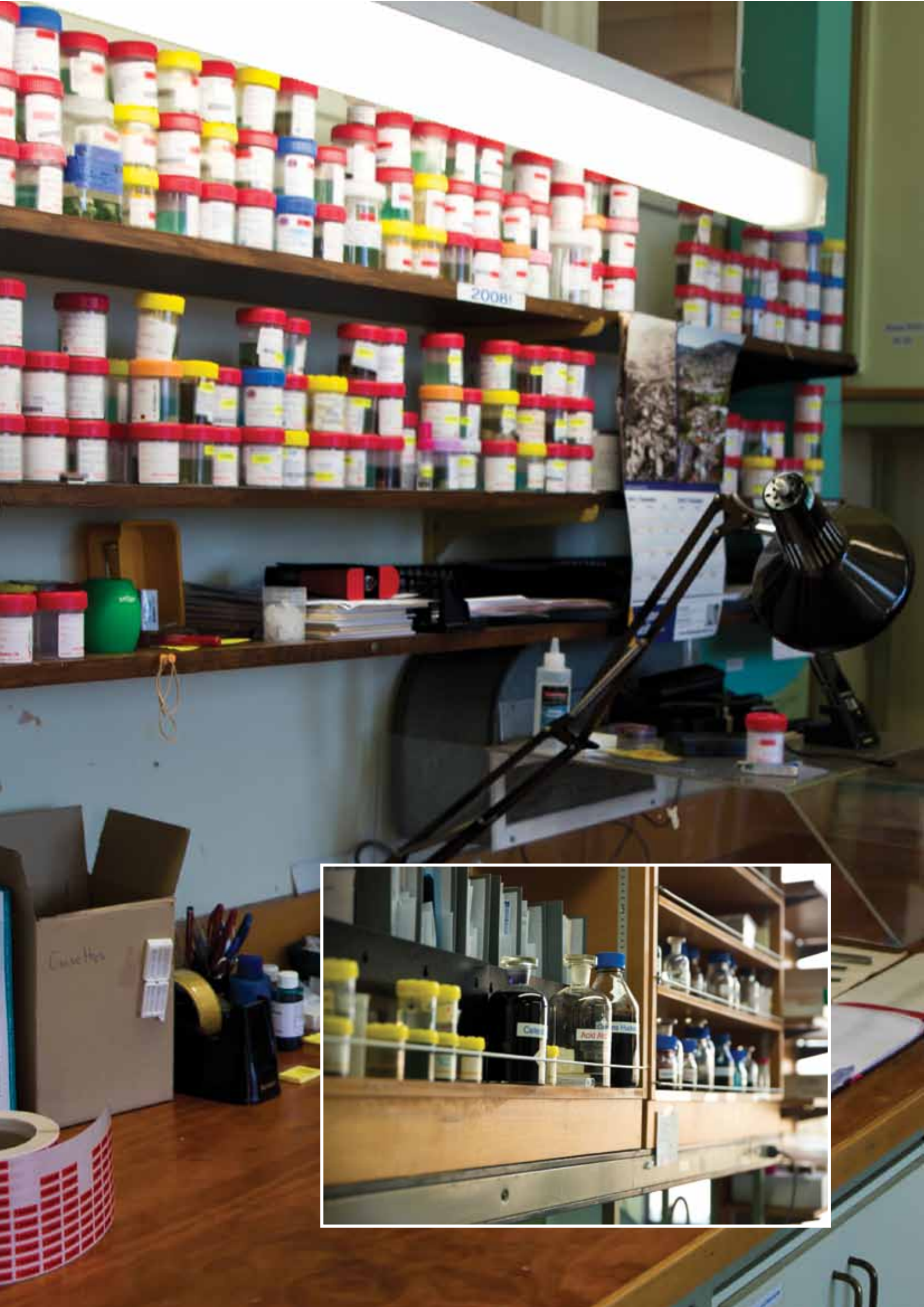
In 2011, the Victorian Branch of the Australian Dental Association in conjunction with the Oral Health Cooperative Research Centre of the University of Melbourne set up a PBRN named eViDent. Some of the projects undertaken by eViDent members include a retrospective study on implant complications in private practice, general practice prescribing and xerostomia, molar/incisor hypomineralisation, and periodontal diagnosis, treatment and maintenance in general practice.

PBRNs foster relationships between practitioners and academics by investigating research questions of relevance to daily clinical practice. The types of studies that could be undertaken in New Zealand range from retrospective studies using dental records, observational studies of routine care, case-control studies, clinical trials and other issues of relevance to dentists here in New

Zealand. PBRN practitioners in the US and Australia feel the experience offers them benefits in terms of improving patient care, providing collegiality and learning opportunities, and that they can give something back to the profession. Many are enthusiastic about the experience and find it empowering. They find that patients are also willing to participate in something that will improve treatments and outcomes.

PBRNs offer benefits in terms of improving patient care and providing collegiality and learning opportunities for members. A symposium is planned for June 2013 to introduce the concept of PBRNs to New Zealand dental practitioners and links with several international PBRNs have been initiated. The group is also offering scholarships to support postgraduate clinical research.





Staff Research Profiles



JOHN AARTS

BEd (WellT) BHealSc DipDentTech DipTertT (CIT) PGDipCDTech MHealSci (Otago)
 Oral Rehabilitation
 Senior Teaching Fellow

Mr Aarts' research platform is removable and fixed prosthodontics, including patient driven outcomes and biomechanical aspects of dental materials. He currently collaborates with staff in the Biomaterials Discipline and Department of Oral Rehabilitation. His major research interest is in the area of implant over-dentures and was published in the *Journal of Clinical Implant Dentistry and Related Research* in 2013. This research combines both clinical outcomes and technical issues; it is the combination of bio-materials, technical and clinical aspects that make the research area unique. Mr Aarts is currently using this platform to investigate the handling properties of materials and design principles that are not well understood by the dental profession.

Research and Collaboration

Mr Aarts is part of a research group which has members from within different disciplines of dentistry and collaborates with the University of Auckland, Department of Mechanical Engineering and Centre for Advanced Composite Materials. He also works within the Discipline of Dental Technology which works closely with the Dental Materials Discipline. Within the School of Dentistry he also collaborates with Clinical Staff investigating issues related to Clinical Dental Technology.

Recent Publications

Anderson, V. R., Pang, L. C., & Aarts, J. M. (2012). New Zealand dental technicians and continuing education: Findings from a qualitative survey. *New Zealand Dental Journal*, 108(2), 47-54.

Bennani, V., Aarts, J. M., & Hong He, L. (2012). A comparison of pressure generated by cordless gingival displacement techniques. *Journal of Prosthetic Dentistry*, 107(6), 388-392.



VINCENT BENNANI

DDS (Reims) Doctorat d'Universite (Nice Sophia Antipolis) CertAdvPros (Tufts) CertAdvImpl (Bordeaux)

Oral Rehabilitation

Senior Lecturer

Dr Bennani has two definite research directions linking his clinical interests and his biomaterials expertise. His research involves laboratory and clinical studies. Dr Bennani's research interests are focused on innovative developments in dentistry, particularly the use of zirconia for implant framework fabrication, and on soft tissue management in implantology. This research has identified the need for new strategies in prosthodontic procedures opening an all-new field in research.

Research and Collaboration

Dr Bennani is actively involved in several collaborative projects with multiple faculties nationally, such as the Faculty of Dentistry, Faculty of Chemistry, and Faculty of Medicine but also internationally. He is currently investigating the use of zirconia in implantology and soft tissues management around implants which is a collaborative project involving the industry.

Recent Publications

Bennani, V., Aarts, J. and He, C. (2012) How to maximize the pressure generated by a cordless retraction paste material. *Journal of Prosthetic Dentistry*. 2012; 107(6), 388-392.

Abduo, J., Lyons, K., Waddell N., Bennani, V., & Swain, M. (2011). A comparison of fit of CNC-milled titanium and zirconia frameworks to implants. *Clinical Implant Dentistry and Related Research*. Advance online publication. doi: 10.1111/j.1708-8208.2010.00334.x

Benic, G. Z., Tawse-Smith, A., & Bennani, V. (2011). Clinical implications of nanosurface technology on clinical success and survival rate of single implant restorations: A review. *Revista Periodontia*, 21 (1), 55-64.

Abduo, J., Lyons, K., Bennani, V., Waddell, N., & Swain, M. (2011). Fit of screw-retained fixed implant frameworks fabricated by different methods: A systematic review. *International Journal of Prosthodontics*, 24(3), 207-220.



JONATHAN BROADBENT

BDS, PGDipComDent, PhD (Otago)

Oral Rehabilitation

Senior Lecturer

Dr Broadbent's research includes projects involving the epidemiology of dental caries, tooth loss, and periodontal disease (with emphasis upon longitudinal research), and particularly upon social inequalities that exist in oral health. He also carries out research pertaining to the New Zealand dental workforce.

Research and Collaboration

During 2011-2012 Dr Broadbent's research focused upon completion of data gathering for Phase 38 of the Dunedin Multidisciplinary Study, and preparing reports from those data. He has focused on his research on dental caries rates and tooth loss over time.

Dr Broadbent continues his work with Professor Murray Thomson on the Dunedin Study, but in mid-2012 he moved to take up a Senior Lectureship in Oral Rehabilitation. This has led to a number of new collaborations and involvement with clinical research.

Recent Publications

Thomson W.M., Mejia G.C., Broadbent J.M., & Poulton R. Construct validity of Locker's global oral health item. *Journal of Dental Research*, 91(11), 1038-1042.

Broadbent J. M., Thomson W. M., Boyens J.V., & Poulton R. Dental plaque and oral health during the first 32 years of life. *Journal of the American Dental Association*, 142(4), 415-426.

Peres M. A., Thomson W. M., Peres K. G., Gigante D. P., Horta B. L., Broadbent J. M., & Poulton R. (2011). Challenges in comparing the methods and findings of cohort studies of oral health: The Dunedin (New Zealand) and Pelotas (Brazil) studies. *Australian and New Zealand Journal of Public Health*, 35(6), 549-556.

Crocombe L. A., Broadbent J. M., Thomson W. M., Brennan D. S., Slade G. D., & Poulton R. (2011). Dental visiting trajectory patterns and their antecedents. *Journal of Public Health Dentistry*, 71(1), 23-31.



JOHN BROUGHTON

ED JP BSc (Massey) BDS PhD PGDipComDent DipGrad (Otago)

Oral Diagnostic and Surgical Sciences

Professor since 2012 (Māori Health), joint appointment with the Department of Preventive and Social Medicine

Professor Broughton's research activities are undertaken within the framework of Māori Knowledge and Development. There have been three main thrusts:

Oranga niho: kaupapa Māori oral health research. Three research projects were undertaken in partnership with community-based Māori health organisations in the North Island. A further area was the evaluation of dental student engagements with Māori oral health providers.

Māori studies. This has been concerned with co-curating a major exhibition on Māori treasures from the Otago Museum for an exhibition at the Shanghai Museum. This also involved two associated publications on aspects of Te Ao Māori for publication in China

Creative works for the stage and screen. This was the production of my Māori dramatic works for the stage by professional Māori theatre company with acclaimed performances throughout New Zealand and at the Melbourne Festival of the Arts.

Research and Collaboration

1. Kaupapa Māori oral health research:

- (i) "Oranga niho me ngā tangata whaiora: Oral health of Māori mental health patients." Professor Broughton is the Principal Investigator for this research, undertaken in partnership with Te Manu Toroa, and the BOPDHB based in Tauranga Moana where the research is taking place (HRC \$293,000).
- (ii) "Reducing disease burden and health inequalities arising from dental disease among Indigenous children: an early childhood caries intervention." Professor Broughton is the New Zealand Principal Investigator for this International Collaborative Indigenous Health Research Partnership which is also being undertaken in Australia and Canada. (HRC \$2.3M). In New Zealand the project is a partnership with Raukura Hauora O Tainui and the Waikato-Tainui College for Research and Development where the research is taking place.

2. Māori Studies:

Co-curator for the exhibition, "Te Ao Māori; Māori Treasures from the Otago Museum, New Zealand" which was at the Shanghai Museum, July-November 2011. This also involved the development and writing of the texts for the artifacts on display and two publications for the exhibition publication which was translated into Mandarin.

3. Dramatic works for the stage and screen:

Professor Broughton's play, *Michael James Manaia* was staged for the Wellington International Festival of the Arts in Wellington in March 2012 followed by performances in Palmerston North, Gisborne, Auckland, New Plymouth, the Melbourne Festival of the Arts and Dunedin, by Taki Rua Productions, Wellington.

Two screenplays written for the screen were:

"Nga Waka O Te Motu," a short film in 3-D for the Rugby World Cup, Taylormade Productions, Dunedin, 2011.

"Toitū, the Otago Settlers Museum," a short film which tells the story of Ngai Tahu in this place followed by the settler population. Taylormade Productions, Dunedin, 2012. This is played continuously at the entranceway to the museum galleries.

Recent Publications

Broughton, J. R., Maipi, J. TeH., Person, M., Randall, A., and Thomson, W. M. (2012) Self-reported oral health and dental service-use of rangatahi within the rohe of Tainui. *New Zealand Dental Journal* 108, No 3: 90-94.

Broughton, J. R. (2012) *The Private War of Corporal Cooper in Playlunch, Five Short New Zealand Plays*. Ed C Prentice and L. Warrington, University of Otago Press, Dunedin, 2012, 19-36. ISBN 978 877578 24 3

Broughton, J. R. (2011) *The Māori World of New Zealand (Te Ao Māori o Aotearoa)* in Te Ao Māori, Māori Treasures from the Otago Museum. Shanghai Museum, Shanghai. ISBN 978-7-5479-0221-9.

Broughton, J. R. (2011) *Hei Tiki* in Te Ao Māori, Māori Treasures from the Otago Museum. Shanghai Museum, Shanghai, 2011. ISBN 978-7-5479-0221-9.



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 surfaces in the oral cavity. He has found that saliva increases the adhesion of the yeast *Candida albicans* to several oral surfaces, including denture acrylics and voice prosthesis silicone. Interestingly, saliva reduced the adhesion of *Staphylococcus epidermidis* to the same surfaces. *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. *C. albicans* is a polymorphic fungus that grows mainly as yeast or mycelia. Professor Cannon is using metabolomics to investigate the changes in metabolism that are associated with the change from yeast to hyphal growth. 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 is also using the *S. cerevisiae* expression system to investigate the resistance of sheep intestinal nematodes to anthelmintics.

Research and Collaboration

Having demonstrated that the major *C. albicans* efflux pump responsible for high-level azole resistance in *C. albicans* clinical isolates is Cdr1p, Professor Cannon has searched for Cdr1p inhibitors. With other members of the SJWRI Molecular Microbiology team and Associate Professor Dave Harding at Massey University, he has screened an in-house combinatorial peptide library to identify RC21v3 as a highly specific Cdr1p-inhibitor. With Professor Abe at Teikyo University, Tokyo Japan, he has shown that RC21v3 sensitizes azole-resistant *C. albicans* strains to fluconazole and itraconazole in a mouse model of oral candidiasis. In a separate collaboration with Professor Larry Sklar of the University of New Mexico, USA, funded by the NIH, Professor Cannon has screened a 1,200-member drug library and identified clorgyline as a broad-spectrum fungal pump inhibitor. Professor Cannon's group is also investigating, with Professor Michael Gottesman of the NIH National Cancer Institute and Professor Jean-Pierre Gillet, University of Namur, Belgium, the role of human efflux pump ABCB5 in melanoma drug resistance.

In collaboration with Dr Silas Villas-Boas, University of Auckland, Professor Cannon has shown that there is a down-regulation of central carbon metabolic pathways during the yeast to hyphal morphological transition. This has indicated some enzymes that may be important in morphogenesis and possibly in pathogenesis. He has continued his study of fungal drug resistance and found that in *Candida glabrata* mutations in two genes are required for strains to develop high-level micafungin resistance. In collaboration with Dr Stewart Bisset from AgResearch, Professor Cannon has demonstrated that nematode efflux pumps can be expressed in *S. cerevisiae*, opening up the possibility of screening for drugs that will overcome the drench resistance of intestinal parasites

of sheep. 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. This calls into doubt the benefit conferred on *C. albicans* by sexual recombination.

Recent Publications

Han, T.-L., Cannon, R. D. and Villas-Bôas, S. G. (2012) Metabolome analysis during the morphological transition of *Candida albicans*. *Metabolomics* 8:1204-1217.

Holmes, A. R., Keniya, M.V., Ivnitski-Steele, I., Monk, B. C., Lamping, E., Sklar, L. A. and Cannon, R. D. (2012) The monoamine oxidase A inhibitor clorgyline is a broad-spectrum inhibitor of fungal ABC and MFS transporter efflux pump activities which reverses the azole resistance of *Candida albicans* and *Candida glabrata* clinical isolates. *Antimicrobial Agents and Chemotherapy* 56: 1508-1515.

Niimi, K., Harding, D. R. K., Holmes, A. R., Lamping, E., Niimi, M., Tyndall, J. D. A., Cannon, R. D. and Monk, B. C. (2012) Specific interactions between the *Candida albicans* ABC transporter Cdr1p ectodomain and a D-octapeptide derivative inhibitor. *Molecular Microbiology* 85:747-767.

Tanabe, K., Lamping, E., Nagi, M., Okawada, A., Holmes, A. R., Miyazaki, Y., Cannon, R. D., Monk, B. C. and Niimi, M. (2011) Chimeras of *Candida albicans* Cdr1p and Cdr2p reveal features of pleiotropic drug resistance transporter structure and function. *Molecular Microbiology* 82:416-433.



NICHOLAS CHANDLER

BDS (Lond) MSc (Manç) PhD (Lond) LDSRCS (Eng) MRACDS (Endo) FDSRCPS (Glas)
FDSRCS (Edin) FFDRCSI

Oral Rehabilitation

Associate Professor

Associate Professor Chandler's field of research is endodontics, with special interests in the diagnosis of dental pulp disease, root canal infection and endodontic surgery. His interest in studies of pulp sensitivity and vitality testing continue as part of an orthodontic study on predicating factors for orthodontic pain.

Three DClintDent students supervised by Associate Professor Chandler have investigated infection at the root apex. Recent studies have investigated the instruments used to resect root ends, and how magnification influences whether cracks and other anomalies are correctly identified in teeth with root-end cavities or fillings. These investigations involve replica techniques and confocal and scanning electron microscopy.

A new collaboration with Turkish investigators has added a further two papers on electronic apex location to publications on this topic which started in 1998.

Research and Collaboration

A new collaboration with Professor Nevin Kartal of the University of Marmara, Istanbul has resulted in two accepted publications on electronic apex location. Studies of illusions in dentistry continue with Professor R O'Shea of Southern Cross University, with results presented at last year's Experimental Psychology conference in Sydney.

Dr Adeleke Oginni (Obafemi Owolowo University) and Associate Professor Chandler have submitted work on apical periodontitis in Nigerian subpopulations which will be published shortly

He has produced three chapters for North American textbooks and a review paper with Dr George Bogen who is in private specialist practice in Beverly Hills. The chapters will appear in 2013 and are about mineral trioxide aggregate as a root filling material, the management of root perforations and treatment of pulp exposures.

Recent Publications

Aziz, A., Chandler, N. P., Hauman, C. H. J., Leichter, J. W., McNaughton, A. & Tompkins, G. (2012) Infection of apical dentin and root-end cavity disinfection. *Journal of Endodontics* 38: 1387-1390

Violich, D. R., Purton, D. G., Chandler, N. P. & Monteith, B. D. (2012) Effect of smear layer on a pulp proximity-indicating instrument. *Odontology* 100: 47-53

Bogen, G. & Chandler, N. (2012) Pulp preservation in immature permanent teeth. *Endodontic Topics* 23: 131-152

Ellis, B., Bennani, V., Purton, D., Chandler, N. & Lowe B. (2012) The effect of ultrasonic instruments on the quality of preparation margins and bonding to dentin. *Journal of Esthetic and Restorative Dentistry* 24: 278-285



DAWN COATES (CLARK)

BSc PhD (Otago)

Oral Sciences

Research Fellow

Dr Coates undertakes research into the cellular and molecular mechanisms involved in tissue growth and remodeling in relation to dental health and disease. Research involves a particular focus on angiogenesis, endoplasmic reticulum stress, multi-potent progenitor cells and osteogenesis. She has also been involved in research in the fields of dental education and workforce analysis. She is currently involved in the supervision of 5 PhD projects and one DClinDent project.

Research and Collaboration

Current projects involve an investigation of the response of fibroblasts, osteoblasts and osteoclasts to the bisphosphonate, zoledronic acid. The research uses functional *in vitro* assays, qRT-PCR and quantification of protein production. Dr Coates has a particular interest in the effects of zoledronic acid on protein prenylation and the regulation of angiogenic gene expression. A recent study focuses on the regulation of the VEGF receptors 1 and 2 by zoledronic acid, and the subsequent effects on osteoblast transcription factor regulation. Research also involves the growth of osteoblasts and multi-potent progenitor cells on different titanium surfaces and *in vitro* analysis of proliferation, bone formation and osteogenic gene expression. Gene and protein markers of pluripotency and mesenchymal cell differentiation are also being examined within dental pulp tissues at different stages of tooth resorption with the aim of using primary tooth pulp as a source of progenitor cells for tooth regeneration. In addition the roll of endoplasmic reticulum stress and the unfolded protein response in relation to the pathogenesis of oral squamous cell carcinoma is being researched.

Recent Publications

Moffat, S. M. and Coates, D. E. (2011) New Zealand's oral health students: education and workforce implications. *New Zealand Dental Journal* 107(2): 51-56.

Moffat, S. M. and Coates, D. E. (2011) Attitudes of New Zealand dentists, dental specialists and dental students towards employing dual-trained Oral Health graduates. *British Dental Journal* 211(8):E16.



MARY CULLINAN

BDS (Syd) MSc (Lond) FADI, FICD

Oral Sciences

Associate Professor

Associate Professor Cullinan's research is predominantly in periodontics, encompassing clinical, basic science and epidemiological studies. A prominent theme is the inter-relationship between chronic periodontitis and systemic diseases such as cardiovascular disease, diabetes and ankylosing spondylitis, particularly in terms of the impact of oral infection and the immune response to oral organisms on systemic diseases. Other themes include the oral microbiota in health and disease (chronic periodontitis, peri-implantitis, dental caries) and the effect of bisphosphonates on gene expression in oral tissues. The long-term effects of triclosan on thyroid function and the oral microbiota in terms of the development of bacterial resistance have also been investigated.

Research and Collaboration

Studies in collaboration with colleagues at The University of Queensland have demonstrated that in cardiovascular patients, periodontitis and the infection burden of *Porphyromonas gingivalis* and *Tannerella forsythia* were related to serum antibody levels to human heat shock protein 60 (HSP60). In patients at high risk of cardiovascular disease (6 risk factors), an improvement in periodontal health resulted in a reduction in anti-HSP60 (HSP60 and GroEL) antibody levels. Further collaboration with the Medical School, University of Queensland, investigated thyroid function and bacterial resistance after long-term use of triclosan in toothpaste and found no untoward effects.

Collaboration with Professor Lisa Heitz-Mayfield from the University of Western Australia and Associate Professor Sheila Williams (Social and Preventive Medicine) is analyzing data on the microbiota in patients with peri-implant disease and comparing two bacterial detection methods (qRT-PCR and Checkerboard DNA-DNA hybridization). The data emanated from an international multicentre, randomised controlled trial.

Recent Publications

Leishman, S. J., Ford, P. J., Do, H. L., Palmer, J. E., Heng, N. C. K., West, M. J., Seymour, G. J., & Cullinan, M. P. (2012). Periodontal pathogen load and increased antibody response to heat shock protein 60 in patients with cardiovascular disease. *Journal of Clinical Periodontology*, 39(10), 923-930. doi: 10.1111/j.1600-051X.2012.01934.x

Soo, L., Leichter, J. W., Windle, J., Monteith, B., Williams, S. M., Seymour, G. J., & Cullinan, M. P. (2012). A comparison of Er:YAG laser and mechanical debridement for the non-surgical treatment of chronic periodontitis: A randomized, prospective clinical study. *Journal of Clinical Periodontology*, 39(6), 537-545. doi: 10.1111/j.1600-051X.2012.01873.x

Cullinan, M. P., Palmer, J. E., Carle, A. D., West, M. J., & Seymour, G. J. (2012). Long term use of triclosan toothpaste and thyroid function. *Science of the Total Environment*, 416, 75-79. doi: 10.1016/j.scitotenv.2011.11.063

Atieh, M. A., Alsabeeha, N. H. M., Duncan, W. J., de Silva, R. K., Cullinan, M. P., Schwass, D., & Payne, A. G. T. (2012). Immediate single implant restorations in mandibular molar extraction sockets: A controlled clinical trial. *Clinical Oral Implants Research*. Advance online publication. doi: 10.1111/j.1600-0501.2011.02415.x



HARSHA DE SILVA

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

Clinical and systematic review-based research in oral and maxillofacial surgery including dento-alveolar surgery, maxillofacial trauma, dental implantology and other clinical aspects of the specialty with a special interest in studying clinicopathological behaviour of oral potentially malignant disorders.

Research and Collaboration

Primary investigator for collaborative research project studying the role of *C. albicans* in the clinicopathological behavior of oral potentially malignant disorders. This collaboration between the Faculty of Dentistry and the Teaching Hospital Karapitiya, Sri Lanka is funded by a NZDA Research Fund award.

Co-investigator in collaborative research project "Measuring the Dental Health of Sjogren's Syndrome Patients in New Zealand" and in a project focusing on "Cell Growth and Survival Characteristics (and in particular p53 isoforms) in Autoimmune Disease and Lymphoma"

Co-investigator in the project studying "Dental pulp cells in the middle region of immature and mature permanent teeth" funded by an Otago Research Grant and in a study looking at "Topographical and functional differences between dental pulp cells in the coronal and apical regions of immature permanent teeth" funded by a NZDA research fund award.

Recent Publications

Ng, D., De Silva, R. K., Smit, R., De Silva, H., & Farella, M. (2012) Facial attractiveness of skeletal class II patients before and after mandibular advancement surgery as perceived by people with different backgrounds. *European Journal of Orthodontics* (2012 May 9) DOI:10.1093/ejo/cjs028

Jattan, R., De Silva, H. L., De Silva, R. K., Rich, A. M., & Love, R. M. (2011). A case series of odontogenic keratocysts from a New Zealand population over a 20-year period. *New Zealand Dental Journal*, 107(4), 112-116.

Parton, A. L., Tong, D. C., De Silva, H. L., Farella, M., & De Silva, R. K. (2011). A nine-year review of orthognathic surgery at the University of Otago. *New Zealand Dental Journal*, 107(4), 117-120.

Patel, K. J., De Silva, H. L., Tong, D. C., & Love, R. M. (2011). Concordance between clinical and histopathologic diagnoses of oral mucosal lesions. *Journal of Oral & Maxillofacial Surgery*, 69(1), 125-133. doi: 10.1016/j.joms.2010.07.075.



ROHANA KUMARA DE SILVA

BDS (Sri Lanka) FDSRCPS(Glas) FFDRCS(Ire) FDSRCS(Eng)
 Oral Diagnostic and Surgical Sciences
 Associate Professor

Associate Professor Kumara De Silva has special interest in exploring the avenues to find ways of rehabilitating partial and complete edentulous patients with economical use of dental implants. The focus is to look for ways of rehabilitating patients in the shortest possible time following dental extractions using the minimum number of implant fixtures. His research expands further into analysing the quality of life of individuals treated with dental implants and to find the feasibility of using metal-free implant fixtures. This area of research was accepted as an area of research strength by the University of Otago.

He also conducts research in the management of post-operative pain after surgical removal of wisdom teeth and to evaluate the metabolism of commonly used analgesics in the body. Several double-blinded crossover trials were conducted to compare different analgesics commonly used in the management of post-operative pain after surgical removal of wisdom teeth. In addition, he has designed a new flap technique for removal of wisdom teeth to minimise post-operative complications.

Research and Collaboration

Associate Professor Kumara De Silva is a member of the Implant Research Group of the Faculty of Dentistry. His research into the management of post-operative pain after surgical removal of wisdom teeth and to evaluate the metabolism of commonly used analgesics in the body was conducted in collaboration with the Department of Anaesthesia at Dunedin Hospital and the National School of Pharmacy.

Recent Publications

Goldsmith, S. M., De Silva, R. K., Tong, D. C., & Love, R. M. (2012). Influence of a pedicle flap design on acute postoperative sequelae after lower third molar removal. *International Journal of Oral & Maxillofacial Surgery*, 41(3), 371-375. doi: 10.1016/j.ijom.2011.08.006

Atieh, M. A., Alsabeeha, N. H. M., Duncan, W. J., de Silva, R. K., Cullinan, M. P., Schwass, D., & Payne, A. G. T. (2012). Immediate single implant restorations in mandibular molar extraction sockets: A controlled clinical trial. *Clinical Oral Implants Research*. Advance online publication. doi: 10.1111/j.1600-0501.2011.02415.x

Atieh, M. A., Alsabeeha, N. H. M., Payne, A. G. T., de Silva, R. K., Schwass, D. R., & Duncan, W. J. (2012). The prognostic accuracy of resonance frequency analysis in predicting failure risk of immediately restored implants. *Clinical Oral Implants Research*. Advance online publication. doi: 10.1111/clr.12057

Siddiqi, A., Kieser, J. A., De Silva, R. K., McNaughton, A., & Duncan, W. J. (2012). Could the median-palate accommodate wide-bodied implants in order to support maxillary overdentures? A radiomorphometric study of human cadavers. *Clinical Oral Implants Research*. Advance online publication. doi: 10.1111/clr.12050



BERNADETTE DRUMMOND

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

Professor Drummond's research focus is on the improvement of the oral health-related quality-of-life in children. Ongoing studies with graduate students include investigation of the longer term outcomes in children with early childhood caries, the changing oral biofilm in health and disease in children utilizing metagenomics, the structural changes in molar incisor hypomineralisation (MIH), long term clinical management for MIH, measurement of the changing pH in the mouth over 24 hours, oral health of children of parents who are smokers and the knowledge and opinions of parents about oral healthcare for their children.

Research and Collaboration

The projects during 2011-12 have involved trying to further identify the causes of MIH. In this project the collaborators have been Professor M Thomson, Dr J Broadbent and Dr R Broadbent in Paediatrics. General collaboration has also been occurring with Professor M Hubbard from the Department of Paediatrics and Department of Pharmacology, University of Melbourne. Other projects investigating treatment for MIH have involved Professor M Swain and Dr Li Hong He. Investigation of the oral biofilm in children has involved collaboration with Dr N Heng, Assoc Prof M Cullinan and Dr J Stanton.

Recent Publications

Rothnie, J. J., Walsh, C. A., Wang, M. J.-J., Morgaine, K. C., & Drummond, B. K. (2012). An exploratory study of pregnant women's knowledge of child oral health care in New Zealand. *New Zealand Dental Journal*, 108(4), 129-133.

Bryant, S., McLaughlin, K., Morgaine, K., & Drummond, B. (2011). Elite athletes and oral health. *International Journal of Sports Medicine*, 32(9), 720-724. doi: 10.1055/s-0031-1277192.

Chan, Y. M., Williams, S., Davidson, L. E., & Drummond, B. K. (2011). Orofacial and dental trauma of young children in Dunedin, New Zealand. *Dental Traumatology*, 27(3), 199-202. doi: 10.1111/j.1600-9657.2011.00989.x.

D'Mello, G., Chia, L., Hamilton, S. D., Thomson, W. M., & Drummond, B. K. (2011). Childhood obesity and dental caries among paediatric dental clinic attenders. *International Journal of Paediatric Dentistry*, 21(3), 217-222. doi: 10.1111/j.1365-263X.2011.01112.x.



WARWICK DUNCAN

ED MDS PhD (Otago) FRACDS (Perio)

Oral Sciences

Associate Professor and Associate Dean (Facilities)

Dental implant research
 Periodontal research
 Forensic research
 Hard tissue imaging and analysis

Research and Collaboration

Associate Professor Duncan's primary research activities involve the fields of Periodontology and Dental Implantology. His research expertise is in the use of animal models for testing therapeutic strategies in these fields, as well as histomorphometric and radiomorphometric analysis of peri-implant, periodontal and maxillofacial tissues. Current research strategies are focused on the development of stem cell therapy for regeneration of bone adjacent to implantable devices with various metallic alloys and modified surfaces. He has attracted >NZ\$1.9 M in funding and have supervised 24 doctoral students and 5 masters students in these areas. He has international collaborations with Universities and Implant companies in Korea, South Africa and Switzerland. He has also conducted and supervised basic sciences and epidemiological research in Clinical Periodontics, Dental Implantology, Forensics and Comparative Anatomy.

Recent Publications

Duncan, W.J. (2011) Maintenance and treatment of peri-implant mucosal diseases in patients with implant-supported overdentures. In: Multi-Disciplinary Management of Periodontal Disease, P.M. Bartold, Jin L. J., eds., Asian Pacific Society of Periodontology: Adelaide, p 1-10. ISBN 0646578960, 9780646578965.

Tawse-Smith, A., Ma, S., Siddiqi, A., Duncan, W. J., Girvan, L., & Hussaini, H. M. (2012). Titanium particles in peri-implant tissues: Surface analysis and histologic response [Case series]. *Clinical Advances in Periodontics*, 2(4), 232-238. doi: 10.1902/cap.2012.110081.

Siddiqi, A., Kieser, J. A., De Silva, R. K., McNaughton, A., & Duncan, W. J. (2012). Could the median-palate accommodate wide-bodied implants in order to support maxillary overdentures? A radiomorphometric study of human cadavers. *Clinical Oral Implants Research*. Advance online publication. doi: 10.1111/clr.12050.

Osman, R. B., Morgaine, K. C., Duncan, W., Swain, M. V., & Ma, S. (2012). Patients' perspectives on zirconia and titanium implants with a novel distribution supporting maxillary and mandibular overdentures: A qualitative study. *Clinical Oral Implants Research*. Advance online publication. doi: 10.1111/clr.12106.



JOHN EGAN

MHealSc PGDipCDTech (Otago)

Oral Rehabilitation

Lecturer

Mr Egan coordinates and teaches the Clinical Dental Technology Postgraduate Diploma within the Dental Technology Discipline. His research interests are removable prosthodontics including patient driven outcomes and global denturism education and activities (clinical dental technicians).

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.

Recent Publications

Egan, J. G., & Swindells, S. A. (2012). A novel prosthodontic alternative for patients who are edentulous and have microstomia: A case report. *Special Care in Dentistry*, 32(4), 160-164. doi: 10.1111/j.1754-4505.2012.00256.x.



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., De Oliveira, M. E., Gallo, L. M., Läubli, T., Tomatis, L., Müller, C., Palla, S. (2011). Firing duration of masseter motor units during prolonged low-level contractions. *Clinical Neurophysiology*, 122(12), 2433-2440. doi: 10.1016/j.clinph.2011.05.017.

Leonardi, R., Farella, M., & Cobourne, M. T. (2011). An association between sella turcica bridging and dental transposition. *European Journal of Orthodontics*, 33(4), 461-465. doi: 10.1093/ejo/cjq106.

Michelotti, A., Buonocore, G., Manzo, P., Pellegrino, G., & Farella, M. (2011). Dental occlusion and posture: An overview. *Progress in Orthodontics*, 12(1), 53-58. doi: 10.1016/j.pio.2010.09.010.

Zembič A., Johannesen, L. H., Schou, S., Malo, P., Reichert, T., Farella, M., & Hämmerle, C. H. F. (2012). Immediately restored one-piece single-tooth implants with reduced diameter: One-year results of a multi-center study. *Clinical Oral Implants Research*, 23(1), 49-54. doi: 10.1111/j.1600-0501.2011.02174.x.

Timmins, K., Liversidge, H., Farella, M., Herbison, P., & Kieser, J. (2012). The usefulness of dental and cervical maturation stages in New Zealand children for Disaster Victim Identification. *Forensic Science, Medicine, & Pathology*, 8(2), 101-108. doi: 10.1007/s12024-011-9251-8.



NORMAN FIRTH

BDS (Adel) MDSc (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

Sinon, S. H., Rich, A. M., Hussaini, H. M., Yoon, H.-S., Firth, N. A., & Seymour, G. J. (2011). Metastases to the oral region from pleural mesothelioma: Clinicopathologic review. *Head & Neck*. Advance online publication. doi: 10.1002/hed.21942



LYNDIE FOSTER PAGE

BSc BDS MComDent PGDipClinDent PhD (Otago)

Oral Rehabilitation

Senior Lecturer

Now a dental epidemiologist and dental public health specialist, Dr Foster Page commenced her career in general dental practice in NZ, before working for 5 years in dental public health in NZ. She began her research career at the University of Otago (in 2008) although had carried out previous research in NZ communities. Dr Foster Page's 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. Her particular interest is in improving oral health outcomes and reducing health inequalities, and has fostered links with both primary care and industry to reach these goals. However, much of her research is concerned with oral health-related quality of life in children and adolescents. Dr Foster Page is involved in cross-sectional surveys, and in a variety of health services research and clinical projects. Her clinical projects involve novel approaches to managing caries in children and include a HRC feasibility project (Hall technique) and a randomised control trial in Otago (ICON technique).

Research and collaboration

Dr Foster Page's international research collaborators include colleagues from Germany, Associate Professor Hendrik Meyer-Leukel and Dr Sebastian Paris; Brazil, Professor Jefferson Traebert, Universidade do Sul de Santa Catarina,; USA, Associate Professor Margherita Fontana; Sheffield, Dr Sarah Baker and Dr Zoe Marshman, and Dundee, Dr Nicola Innes.

Recent Publications

Foster Page, L. A., Kang, M., Anderson, V., & Thomson, W. M. (2012). Appraisal of the Dundee Ready Educational Environment Measure in the New Zealand dental education environment. *European Journal of Dental Education*, 16(2), 78-85. doi: 10.1111/j.1600-0579.2011.00725.x

Foster Page, L. A., & Thomson, W. M. (2012). Caries prevalence, severity, and 3-year increment, and their impact upon New Zealand adolescents' oral-health-related quality of life. *Journal of Public Health Dentistry*, 72(4), 287-294. doi: 10.1111/j.1752-7325.2012.00336.x

Foster Page, L. A., Thomson, W. M., Mohamed, A. R., & Traebert, J. (2011). Performance and cross-cultural comparison of the short-form version of the CPQ11-14 in New Zealand, Brunei and Brazil. *Health & Quality of Life Outcomes*, 9, 40. doi: 10.1186/1477-7525-9-40

Foster Page, L. A., Thomson, W. M., & Quick, A. N. (2011). Changes in malocclusion over time in New Zealand adolescents. *Australian Orthodontic Journal*, 27(2), 169-175.



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; and separate from this is also active in research related to Endodontic curriculum development and teaching. Results of her PhD research around pulp biology and angiogenesis associated with immature permanent teeth have been presented at international conferences and publication in internationally peer reviewed journals. This work has influenced clinical practice by providing further knowledge about pulp cell behaviour and healing following dental trauma. As main author she has published on Endodontic teaching and this work is on-going and now looking at 5 year outcomes. Lara was invited to Switzerland to speak on endodontic curriculum development at the University Forum of 160 international universities.

Lara is a co-supervisor of Clinical Doctorate students and has had substantial competitive grant applications associated with these. This includes angiogenesis associated with oral pathology and broader clinical research pertaining to endodontic practice and disease. From this work, three manuscripts have been published in internationally peer reviewed journals and oral presentations made at international conferences. As part of the Immunopathology group Lara assists in advising on projects including PhD pulp research which has evolved from her own research theme.

Research and Collaboration

The scope of this research during 2011-2012 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 results interpretation.

Research pertaining to Clinical practice and Endodontic radiography is ongoing in collaboration with Associate Professor Nick Chandler: Studies investigating management of the root-end during endodontic surgery is being further developed to consider the role magnification may play and clinical research involving endodontic management of immature permanent teeth has been expanded.

Collaboration with Suzanne Hanlin, Dr Andrew Tawse-Smith and Dr Vivienne Anderson has seen research that evaluates student outcomes and the translation of knowledge and understanding from the preclinical to clinical environment. This uses multiple forms of assessment to provide rigorous and meaningful evaluation.

Recent Publications

Alothmani, O. S., Friedlander, L.T., Monteith, B. D., & Chandler, N. P. (2012). Influence of clinical experience on the radiographic determination of endodontic working length. *International Endodontic Journal* 46, 211-217. doi: 10.1111/j.1365-2591.2012.02109.x.

Friedlander, L.T., Chandler, N. P., & Drummond, B. K. (2012). Avulsion and replantation of a primary incisor tooth. *Dental Traumatology*. Advance online publication. doi: 10.1111/j.1600-9657.2012.01168.x.

Friedlander, L., & Anderson, V. (2011). A new predoctoral endodontic module: Evaluating learning and effectiveness. *Journal of Dental Education*, 75(3), 351-359.

Friedlander, L., Chandler, N., & Love, R. (2011). Periapical healing following combined non-surgical and surgical retreatments [Case report]. *ENDO*, 5(1), 27-34.



CATHARINA HAUMAN

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

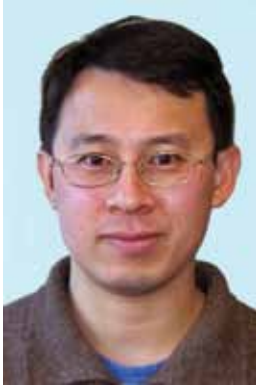
Tina Hauman is researching the determination of bacterial viability in dentine by fluorescence. A novel technique, using live-dead stain and confocal microscopy, has been developed for ex vivo determination of bacterial infiltration, distribution and viability in dentinal tubules. This technique has 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

Parmar, D., Hauman, C. H. J., Leichter, J. W., McNaughton, A., & Tompkins, G. R. (2011). Bacterial localization and viability assessment in human ex vivo dentinal tubules by fluorescence confocal laser scanning microscopy. *International Endodontic Journal*, 44(7), 644-651. doi: 10.1111/j.1365-2591.2011.01867.x.



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 the sequencing and analysis of oral bacterial genomes, and the characterisation of oral microbial diversity in relation to health and disease. Both areas of research utilise next-generation DNA sequencing technologies, namely the Roche GS-FLX Titanium and GS Junior 454-based pyrosequencers, and the Life Technologies Ion Torrent-based PGM system.

The scope of research conducted by Dr Heng's group during 2011-2012 included:

- (1) Characterising the genomes of (a) antimicrobial-producing strain of the oral bacterium *Streptococcus salivarius*, and (b) *Streptococcus trichosurus* CBI, a strain of a new streptococcal species isolated from the oral cavity of a New Zealand-adapted brushtail possum.
- (2) Analysing the 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.

Research and Collaboration

Within the Faculty of Dentistry, Dr Heng has ongoing collaborations with Professor G.J. Seymour and Associate Professor M.P. Cullinan (Discipline of Periodontics), and Professor B.K. Drummond (Discipline of Paediatric Dentistry) in relation to the metagenomic projects. In addition, he collaborates with Professor J.R. Tagg, Dr J.D.F. Hale and Dr P.A. Wescombe (all from BLIS Technologies Ltd) in the field of bacterially-produced antimicrobial proteins (bacteriocins), mainly focusing on genomic data-mining. Among the aims of the genome sequencing projects are: (a) uncover new antimicrobial proteins produced by *S. salivarius* which could be useful in the development of new oral probiotic preparations and (b) determine if there are any virulence factors encoded by the genomes in order to verify the "safety" of the species for use as probiotics. In 2012, an international collaboration was set up with Dr A. Malik (Universitas Indonesia, Indonesia), which will result in genome analyses of bacteriocin-producing lactic acid bacteria isolated from Indonesian foods.

Recent Publications

Wescombe, P.A., Hale, J. D. F., Heng, N. C. K., & Tagg, J. R. (2012). Developing oral probiotics from *Streptococcus salivarius*. *Future Microbiology*, 7(12), 1355-1371. doi: 10.2217/fmb.12.113.

Leishman, S. J., Ford, P. J., Do, H. L., Palmer, J. E., Heng, N. C. K., West, M. J., Seymour, G. J., Cullinan, M. P. (2012). Periodontal pathogen load and increased antibody response to heat shock protein 60 in patients with cardiovascular disease. *Journal of Clinical Periodontology*, 39(10), 923-930. doi: 10.1111/j.1600-051X.2012.01934.x.

Heng, N. C. K., Haji-Ishak, N. S., Kalyan, A., Wong, A. Y. C., Lovrič, M., Bridson, J. M., Artamonova, J., Stanton, J.-A. L., Wescombe, P. A., Burton, J. P., Cullinan, M. P., Tagg, J. R. (2011). Genome sequence of the bacteriocin-producing oral probiotic *Streptococcus salivarius* strain M18. *Journal of Bacteriology*, 193(22), 6402-6403. doi: 10.1128/jb.06001-11.

Frese, S. A., Benson, A. K., Tannock, G. W., Loach, D. M., Kim, J., Zhang, M., Heng, N. C. K., Patil, P. B., Juge, N., Mackenzie, D. A., Pearson, B. M., Lapidus, A., Dalin, E., Tice, H., Goltsman, E., Land, M., Hauser, L., Ivanova, N., Kyrpides, N. C., Walter, J. (2011). The evolution of host specialization in the vertebrate gut symbiont *Lactobacillus reuteri*. *PLoS Genetics*, 7(2), e1001314. doi: 10.1371/journal.pgen.1001314.



ANN HOLMES

BSc(Hons) PhD (Lond)
Oral Sciences
Honorary Senior Research Fellow

Dr Holmes' research field is the molecular biology of oral microbes, in particular of the oral commensal fungus, *Candida albicans*, which can cause mucosal and systemic infections of humans. Particular interests include the study of membrane transporter molecules that can contribute to resistance to antifungal and anticancer drugs, and adherence mechanisms of *C. albicans*.

Research and Collaboration

In 2011 and 2012 Dr Holmes was a consultant researcher on Centre for Innovation contracts to Prof Richard Cannon to collaborate with Drs Kurt Lackovic and Brad Sleebs, at the Walter and Elisa Hall Research Institute (WEHI), Melbourne with the aim of developing high throughput screens for new antifungal drugs and azole resistance reversal agents. Dr Holmes visited the WEHI in July 2011 in order to transfer technical aspects of our research.

She is also part of the research team led by Prof Richard Cannon in collaboration with Drs Brian Monk, Kyoko Niimi, Masakazu Niimi, Mikhail Keniya and Erwin Lamping, Department of Oral Sciences, University of Otago, on an ongoing research project: "Antifungal drug efflux pumps", 2001-present. The research involves collaboration with the following researchers: Professor Andrea Goffeau, Université Catholique de Louvain, Louvain-la-Neuve, Belgium; Professor S Abe, Teikyo University, Japan, Professor John Cutfield, University of Otago; Dr David Harding, Massey University; Dr David Perlin, PHRI, New York; Dr Joel Tyndall, University of Otago and Professor Larry Sklar, University of New Mexico, Albuquerque, New Mexico, USA. Also part of this collaboration is a continuing interest in human efflux pumps including ABCB1, in collaboration with Prof Cannon and Dr Masakazu Niimi, and the melanoma-associated transporter ABCB5, in collaboration with Prof Cannon and Drs Masakazu Niimi and Keniya, and Prof Jean-Pierre Gillet, Laboratory of Molecular Cancer Biology, Department of Biomedical Sciences, University of Namur, Belgium.

Dr Holmes continues her interest in adherence mechanisms of *C. albicans* in collaboration with Prof Richard Cannon, Prof Karl Lyons and Assoc Prof Patrick Dawes (Department of Medical and Surgical Sciences, University of Otago), and joint supervision of DCLinDent Students Leane Hou (graduated 2012) and Yeen Lim (completion in 2013).

Recent Publications

Holmes, A. R., Keniya, M.V., Ivnitski-Steele, I., Monk, B. C., Lamping, E., Sklar, L. A., & Cannon, R. D. (2011). The monoamine oxidase A inhibitor clorgyline is a broad-spectrum inhibitor of fungal ABC and MFS transporter efflux pump activities which reverses the azole resistance of *Candida albicans* and *Candida glabrata* clinical isolates. *Antimicrobial Agents & Chemotherapy*, 56(3), 1508-1515. doi: 10.1128/aac.05706-11.

Monk, B. C., Niimi, K., Holmes, A. R., Strouse, J. J., Sklar, L. A., & Cannon, R. D. (2012). Fungal efflux-mediated resistance: From targets to inhibitors. In G. Tegos & E. Mylonakis (Eds.), *Antimicrobial drug discovery: Emerging strategies* (pp. 77-88). Oxford, UK: CABI.

Niimi, K., Harding, D. R. K., Holmes, A. R., Lamping, E., Niimi, M., Tyndall, J., Cannon, R. D., Monk, B. C. (2012). Specific interactions between the *Candida albicans* ABC transporter Cdr1p ectodomain and a D-octapeptide derivative inhibitor. *Molecular Microbiology*, 85(4), 747-767. doi: 10.1111/j.1365-2958.2012.08140.x

Holmes, A. R., Chong, K., Rodrigues, E., Cannon, R. D., Carpenter, E., Ruske, D. R., & Dawes, P. J. D. (2012). Yeast colonization of voice prostheses: Pilot study investigating effect of a bovine milk product containing anti-*Candida albicans* immunoglobulin A antibodies on yeast colonization and valve leakage. *Annals of Otolaryngology & Laryngology*, 121(1), 61-66.



LUDWIG JANSEN VAN VUUREN

MTech DentTech (Tshwane UT) NatDip DentTech BTech DentTech (Technikon Pret)
 Oral Rehabilitation
 Lecturer

Research Platform

Mr Jansen van Vuuren's research interests are the mechanical properties and microstructure of bio-materials and dental hard tissues. He is currently investigating the structure, microstructure and chemical composition of human, reptile, dolphin and shark teeth and relating the arrangement of these structures to their mechanical properties.

Research and Collaboration

With his current research on dental hard tissues, he is working with researchers within the Sir John Walsh Research Institute and collaborating locally with researchers from the Department of Chemistry, Department of Geology and nationally with the Department of Chemical and Materials Engineering (University of Auckland) and internationally with the School of Anatomical Sciences (University of the Witwatersrand, South Africa).

Recent Publications

Loch, C., Swain, M.V., Jansen van Vuuren, L., Kieser, J. A., & Fordyce, R. E. (2012) Mechanical properties of dental tissues in dolphins. *Archives of Oral Biology* (E-pub)

He, L. H. & Jansen van Vuuren, L. (2012) Development of a dental model hardener. *New Zealand Dental Journal*; 108:13-18.

Pechè, W. A., Jansen van Vuuren, L., & Park, C. (2011) Full-arch milled titanium implant bridge: technical report. *New Zealand Dental Journal*; 107:101-103.



THOMAS KARDOS

MDS PhD (Otago) FFOP(RCPA)

Oral Rehabilitation

Professor of Oral Biology and Oral Pathology, Deputy Dean, Associate Dean (Postgraduate Studies), Head of Department

The use of information, communication technologies (ICT) has been widely adopted by practicing professionals. One of the challenges for the Faculty is to develop curricula that not only prepare graduates for life long learning but also provide them with an understanding of scientific and social concepts and cultural relationships as they apply to professional practice and research in New Zealand. Within the Faculty, there are a variety of opportunities for academic staff to strengthen the research-teaching nexus through engaging in research into teaching practice.

Research and Collaboration

Visiting Fellows, Education Research, 2011-12:

Dr Heli Vinkka-Puhakka is an orthodontics specialist and holds the position of Senior Lecturer in the Department of Oral Disease at the University of Turku, Finland. During the period of her Fellowship, she shared with the Faculty of Dentistry the experiences she had in the design and implementation of new curricula to meet international standards in 29 countries, and compared the programme at Otago with others in Europe.

Dr Mary E. Williard is the Dental Health Aide Therapist Training Director for the Alaska Native Tribal Health Consortium in Anchorage, Alaska. She has worked in American Indian/ Alaska Native dental programmes since 1996, and was awarded the NRHA Distinguished Educator Award. Her research was a comparison of oral health programmes in NZ and USA. The introduction of programmes in Oral Health in the "lower 48 states" is currently being debated.

Recent Publications

Kardos, T. (2012). Cellular responses to metal ions released from implants. *Journal of Oral Implantology*. Advance online publication. doi: 10.1563/aid-joi-d-11-00249.1.

Firth, N. A., Friedlander, L., Parachuru, V., Kardos, T., Rich, A., & Seymour, G. (2012). Regulation of immune cells in oral lichen planus. *Journal of Dental Research*, 91 (Spec Iss C), 169862. Retrieved from <http://www.dentalresearch.org>.

Hussaini, H. M., Waddell, J. N., Girvan, L., West, L. M., Kardos, T. B., Rich, A. M., & Seymour, G. J. (2011). Silver solder "tattoo": A novel form of oral pigmentation identified with the use of field emission scanning electron microscopy and electron dispersive spectrography. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, & Endodontology*, 112(4), e6-e10. doi: 10.1016/j.tripleo.2011.03.049.

Moffat, S. and Kardos, R. (2012). New Zealand, Section 4. In, *A review of global literature on dental therapists*. Eds Nash, D.A., Friedman, J.W. and Mathu-Muju. K.R. Kellogg Foundation. Battle Creek, Michigan U.S.A. Pages 70-128.



MIKHAIL KENIYA

MD Kandidat Nauk (Rostov State)

Oral Sciences

Research Fellow

Dr Keniya's main scientific interests are in investigating mechanisms of oral microbial drug resistance, based on his expertise in microbiology, protein chemistry and enzymology, molecular genetics. This includes the structural biology of membrane transporters, and compound library screening. From the beginning of 2011 he has been an associate investigator on a three year Marsden project "Multifunctional azoles: A triple whammy designed to defeat drug resistance" awarded to Dr Brian Monk.

Research and Collaboration

The goal of the ongoing Marsden project discovery is to design a multifunctional azole antifungal that can also avoid resistance development by inhibiting efflux pumps, which are the major cause of drug resistance in various oral fungi. This is done in collaboration with German pharmaceutical company MicroCombiChem (MCC). This yielded novel efflux pump inhibitors which has generated a new commercial space for MCC.

Recent Publications

Holmes, A. R., Keniya, M. V., Ivnitski-Steele, I., Monk, B. C., Lamping, E., Sklar, L. A., & Cannon, R. D. (2011). The monoamine oxidase A inhibitor clorgyline is a broad-spectrum inhibitor of fungal ABC and MFS transporter efflux pump activities which reverses the azole resistance of *Candida albicans* and *Candida glabrata* clinical isolates. *Antimicrobial Agents & Chemotherapy*, 56(3), 1508-1515. doi: 10.1128/aac.05706-11.



JULES KIESER

BSc BDS PhD DSc FLS FDSRCS(Edin) FFSSoc FICD FFOMP(RCPA)

Oral Sciences

Professor; Oral Biology

Director, Sir John Walsh Research Institute

Professor Kieser's ongoing research rests on two independent, though related platforms; craniofacial biomechanics and forensic biology. In the former, he collaborates widely within the University, as well as with overseas partners in an effort to address the challenges of such issues as dysphagia, salivary hypofunction, dental evolution and masticatory efficiency. His forensic research has focused on forensic odontology, traumatology and taphonomy.

Research and Collaboration

Professor Kieser collaborates with a large number of academics across the University, as well as researchers from overseas institutions, including the Universities of Cranfield (UK), Aveiro (Portugal), Auckland, Canterbury, Witwatersrand (South Africa), as well as University College London and the Australian National University.

Recent Publications

Wang, Y. K., Nash, M. P., Pullan, A. J., Kieser, J. A., Rohrle, O. (2012) Model-based identification of motion sensor placement for tracking retraction and elongation of the tongue. *Biomechanics and Modeling in Mechanobiology* 12:383-399.

Kennedy, D. M., Stanton, J. -A. L., García, J. A., Mason, C., Rand, C. J., Kieser, J. A., & Tompkins, G. R. (2012). Microbial analysis of bite marks by sequence comparison of streptococcal DNA. *PLOS ONE*, 7(12), e51757. doi: 10.1371/journal.pone.0051757.

Bushby, S. K., Thomas, N., Priemel, P. A., Coulter, C. V., Rades, T., & Kieser, J. A. (2012). Determination of methylphenidate in Calliphorid larvae by liquid-liquid extraction and liquid chromatography mass spectrometry: Forensic entomotoxicology using an *in vivo* rat brain model. *Journal of Pharmaceutical & Biomedical Analysis*, 70, 456-461. doi: 10.1016/j.jpba.2012.06.024.

Po, J. M. C., Kieser, J. A., Gallo, L. M., Tésenyi, A. J., Herbison, P., & Farella, M. (2011). Time-frequency analysis of chewing activity in the natural environment. *Journal of Dental Research*, 90(10), 1206-1210. doi: 10.1177/0022034511416669.



JONATHAN LEICHTER

BA, DMD, Cert Perio (Harvard)
Oral Sciences
Senior Lecturer

Dr Leichter's prime areas of research are periodontology, dental implants, dental trauma and laser applications in dentistry. His multi-disciplinary research has resulted in publications in high ranking international peer reviewed journals in periodontology, endodontics, cariology and dental materials. His clinical research into lasers in periodontology has established that Er:YAG lasers are the only monotherapy for the treatment of periodontitis that is equivalent to the "gold standard" of scaling and root planing. Work with dental lasers is opening up novel treatment strategies for the treatment of peri-implantitis as well. The scope and quality of Dr Leichter's research has been recognized in the way of being invited to act as a reviewer and editor for peer reviewed dental journals and in invitations to present his research in New Zealand, Australia, Japan and in the US.

Research and Collaboration

The prevalence of periodontal diseases in Oman and the impact on Oral Health Impact Profile conducted as part of the Dental Epidemiology and Public Health Group of the SJWRI.

The relationship between diabetes, smoking and periodontal status in a New Zealand population conducted as part of the Dental Epidemiology and Public Health Group of the SJWRI.

Endoplasmic reticulum Stress and Russell Body: Study of the Relationship Using Inflammatory Models conducted as part of the Oral Molecular and Immunopathology Group of the SJWRI.

Canonical Wnt Signaling pathways in healing around titanium dental implants conducted as part of the Oral Molecular and Immunopathology Group of the SJWRI.

Healing and bone formation in the sheep maxillary sinus following augmentation with MoaBone conducted as part of the Oral Molecular and Immunopathology Group and Biomechanics and Oral Implantology Group of the SJWRI.

Recent Publications

Aziz, A., Chandler, N. P., Hauman, C. H. J., Leichter, J. W., McNaughton, A., & Tompkins, G. R. (2012). Infection of apical dentin and root-end cavity disinfection. *Journal of Endodontics*. Advance online publication. doi: 10.1016/j.joen.2012.06.034.

Peters, N., Tawse-Smith, A., Leichter, J. and Tompkins, G. R. (2012) Laser Therapy: The Future of Peri-Implantitis Management? *Brazilian Journal of Periodontology*, March 2012 V22:1, 26-33.

Soo, L., Leichter, J. W., Windle, J., Monteith, B., Williams, S. M., Seymour, G. J., & Cullinan, M. P. (2012). A comparison of Er:YAG laser and mechanical debridement for the non-surgical treatment of chronic periodontitis: A randomized, prospective clinical study. *Journal of Clinical Periodontology*, 39(6), 537-545. doi: 10.1111/j.1600-051X.2012.01873.x.

Parmar, D., Hauman, C. H. J., Leichter, J. W., McNaughton, A., & Tompkins, G. R. (2011). Bacterial localization and viability assessment in human *ex vivo* dentinal tubules by fluorescence confocal laser scanning microscopy. *International Endodontic Journal*, 44(7), 644-651. doi: 10.1111/j.1365-2591.2011.01867.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 focused 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

Desai, S.V., Love, R. M., Rich, A. M., & Seymour, G. J. (2011). Toll-like receptor 2 expression in refractory periapical lesions. *International Endodontic Journal*, 44(10), 907-916. doi: 10.1111/j.1365-2591.2011.01893.x

Verma, P., & Love, R. M. (2011). A Micro CT study of the mesiobuccal root canal morphology of the maxillary first molar tooth. *International Endodontic Journal*, 44(3), 210-217. doi: 10.1111/j.1365-2591.2010.01800.x

Desai, S.V., Love, R. M., Rich, A. M., & Seymour, G. J. (2011). Antigen recognition and presentation in periapical tissues: A role for TLR expressing cells? *International Endodontic Journal*, 44(2), 87-99. doi: 10.1111/j.1365-2591.2010.01817.x

Patel, K. J., De Silva, H. L., Tong, D. C., & Love, R. M. (2011). Concordance between clinical and histopathologic diagnoses of oral mucosal lesions. *Journal of Oral & Maxillofacial Surgery*, 69(1), 125-133. doi: 10.1016/j.joms.2010.07.075

Goldsmith, S. M., De Silva, R. K., Tong, D. C., & Love, R. M. (2012). Influence of a pedicle flap design on acute postoperative sequelae after lower third molar removal. *International Journal of Oral & Maxillofacial Surgery*, 41(3), 371-375. doi: 10.1016/j.ijom.2011.08.006

Becconsall-Ryan, K., & Love, R. M. (2011). Range and demographics of radiolucent jaw lesions in a new zealand population. *Journal of Medical Imaging & Radiation Oncology*, 55(1), 43-51. doi: 10.1111/j.1754-9485.2010.02228.x



KARL LYONS

MDS PhD (Otago) CertMaxillofacialPros (UCLA) FRACDS
Professor and Chair in Restorative Dentistry

Professor Lyons has carried out research in dental implants and materials and in microbial adhesion to dental obturator prostheses, particularly adhesion of *C. albicans* and *S. epidermidis*. The latter was the topic of his PhD, which was awarded in 2012. Dental obturator prostheses can restore surgical resection defects in the maxilla of patients who have had surgery to remove cancer in the palate or sinuses, but microbial adhesion, especially *C. albicans*, to these prostheses reduces the lifetime of the prosthesis and can affect the health of these patients, particularly during radiotherapy.

Research and Collaboration

His research has included both clinical and laboratory research. The most significant clinical findings have been (1) during head and neck radiotherapy there are large and rapid increases in microbial colonisation and a very high *C. albicans* colonisation count at the end of week one of radiotherapy can be used as a predictor for the need for anti-fungal treatment (and frequently hospitalisation) to manage oral complication from radiotherapy (2) microbial colonisation of obturators increases during prosthodontic treatment, and during up to 10 years of follow-up, until a new obturator prosthesis is provided to a patient suggesting obturator prostheses should be relined or remade regularly. Significant laboratory findings have been: (1) the influence saliva has on either increasing or reducing microbial adhesion; (2) identifying a salivary protein that *C. albicans* adheres to. This research has been carried out with Professor Richard Cannon, Professor Robert Love and Dr Ann Holmes.

Prof Lyons has also been collaborating with DCLinDent students with a research emphasis on clinical and in vitro research in the areas of implant prosthodontics and dental materials, particularly ceramics.

Recent Publications

Abduo, J., Lyons, K. M., Bennani, V., Waddell, J. N., and Swain, M. V. (2012). A comparison of fit of CNC-milled titanium and zirconia frameworks to implants. *Clinical Oral Implants Dentistry and Related Research*. 14 (Supplement 1): e20-e29

Abduo, J., Lyons, K. M., Bennani, V., Waddell, J. N., and Swain, M. V. (2011). Fit of implant screw-retained fixed frameworks fabricated by different methods: a systematic review. *International Journal of Prosthodontics*. 24: 207-220

Chang, C. W., Waddell, J. N., Lyons, K. M. and Swain, M. V. (2011). Cracking of porcelain surfaces arising from abrasive grinding with a dental air turbine. *Journal of Prosthodontics*. 20: 613-620

Mackie, A., Lyons, K. M., Thomson, W. M., and Payne, A. G. T. (2011). Mandibular 2-implant overdentures: Prosthodontic maintenance using different matrices with different loading strategies. *International Journal of Prosthodontics*. 24: 405-416



SUNYOUNG MA

BDS DClinDent (Otago)
 Oral Rehabilitation
 Senior Lecturer in Prosthodontics

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 the long-term prospective data. Her main focus of research lies on alveolar ridge resorption associated with implant prostheses, long-term implant success and prosthodontic maintenance issues.

Recent Publications

Osman, R. B., Morgaine, K. C., Duncan, W., Swain, M. V., & Ma, S. (2012). Patients' perspectives on zirconia and titanium implants with a novel distribution supporting maxillary and mandibular overdentures: A qualitative study. *Clinical Oral Implants Research*. Advance online publication. doi: 10.1111/clr.12106.

Alsabeeha, N. H. M., Ma, S., & Atieh, M. A. (2012). Hydroxyapatite-coated oral implants: A systematic review and meta-analysis. *International Journal of Oral & Maxillofacial Implants*, 27(5), 1123-1130.

Osman, R. B., Payne, A. G., & Ma, S. (2012). Prosthodontic maintenance of maxillary implant overdentures: A systematic literature review. *International Journal of Prosthodontics*, 25(4), 381-391.

Tawse-Smith, A., Ma, S., Siddiqi, A., Duncan, W. J., Girvan, L., & Hussaini, H. M. (2012). Titanium particles in peri-implant tissues: Surface analysis and histologic response [Case series]. *Clinical Advances in Periodontics*, 2(4), 232-238. doi: 10.1902/cap.2012.110081.



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.

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 professionals. 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

Wade, K. J., & Meldrum, A. M. (2011). Gingivitis control. In F. S. Panagakos & R. M. Davies (Eds.), *Gingival diseases: Their aetiology, prevention and treatment* (pp. 139-154). Rijeka, Croatia: InTech.



TRUDY MILNE

PhD (Qld UT) NZCS

Oral Sciences

Research Fellow

Dr Milne's interest continues in the area of gene expression with the goal of furthering our understanding of the immunopathogenesis of periodontal disease and the relationship between periodontal and systemic diseases. The effect of environmental factors, such as smoking, and disease susceptibility is being investigated with the determination of the DNA methylation status of a number of osteogenic and angiogenic genes in gingival tissues. The development of a multiplex qPCR assay for the relative quantitation of pathogenic bacteria has seen involvement with a number of clinical trials.

Research and Collaboration

Current research includes: the successful completion of the PhD research project "The characterisation of natural regulatory T cells and Th17 cells in human periodontal disease", in collaboration with Dr Praveen Parachuru, Professor Gregory Seymour and Professor Alison Rich; a continuing collaboration with Dr Dawn Coates and Associate Professor Mary Cullinan looking at "The impact of bisphosphonates on gene expression in human gingival fibroblasts"; a collaboration with Professor Gregory Seymour and Associate Professor Mary Cullinan resulted in the awarding of a grant from the New Zealand Dental Association Research Fund to investigate the "DNA methylation status of osteogenic and angiogenic genes in gingival tissues of smokers and non-smokers"; in collaboration with Professor Gregory Seymour and Professor Alison Rich, as part of the Molecular and Immunopathology Research Group, a number of oral diseases, including oral squamous cell carcinoma and oral mucosal diseases are being studied using gene expression analysis and immunohistological techniques. Dr Milne is also currently co-supervising a number of PhD and DClinDent students.

Recent Publications

Saminathan, A., Vinoth K. J., Wescott, D. C., Pinkerton, M. N., Milne, T. J., Tong, C., Meikle, M. C. (2012) The effect of cyclic mechanical strain on the expression of adhesion-related genes by periodontal ligament cells in two-dimensional culture. *Journal of Periodontal Research* 47:2 212-221



SUSAN MOFFAT

BA DPH (Otago) CertDentTherp (Wgtn)

Oral Sciences

Lecturer

Susan Moffat's field of research includes dental public health, dental therapy history, and the dental therapy/Oral Health workforce. Dental therapy is an academic discipline which has not (until recently) had a research tradition of its own, having relied traditionally on work undertaken in the disciplines of paediatric dentistry and dental public health. In that respect, Susan is one of the pioneers in dental therapy research, with her work laying some of the groundwork for an ongoing research foundation for the discipline.

In 2007, the University of Otago introduced a Bachelor of Oral Health (BOH) degree. This has led to a new area of research into Oral Health education and workforce, and Susan also has a key role in that.

Research and Collaboration

University of Otago Targeted Research Funding and a grant from the Ministry of Health's (MOH) Oral Health Research Fund have enabled Susan to carry out dental therapy/Oral Health workforce and education research. Susan has also been able to collaborate with other Faculty staff on research projects where knowledge of the dental therapy/Oral Health profession or education is required, and has collaborated internationally with researchers in Australia, the United States and other countries.

Susan's PhD research centres on the establishment of the New Zealand School Dental Service (SDS). Her research will place the development of the SDS within New Zealand's social, economic and political history, and will emphasise the contribution of the early dental nurses to the founding of the SDS.

Dental public health is also a research interest. Susan is currently principal investigator in a research project funded by a University of Otago Research Grant, that looks at the acceptability of primary health care nurses giving oral health advice to the parents of preschool children.

Recent Publications

Moffat, S., & Coates, D. (2011). Attitudes of New Zealand dentists, dental specialists and dental students towards employing dual-trained Oral Health graduates. *British Dental Journal*, 211, E16. doi: 10.1038/sj.bdj.2011.870

Moffat, S. M., & Coates, D. E. (2011). New Zealand's oral health students: Education and workforce implications. *New Zealand Dental Journal*, 107(2), 51-56.

Nash, D. A., Friedman, J. W., Mathu-Muju, K. R., Robinson, P. G., Satur, J., Moffat, S., Kardos, R., Fernando, E. (2012). A review of the global literature on dental therapists: In the context of the movement to add dental therapists to the oral health workforce in the United States. Battle Creek, MI: W. K. Kellogg Foundation, 456p.

Pang, L. C., Anderson, V. R., & Moffat, S. M. (2012). Initial University of Otago oral health graduates' employment pathways and preparedness for work. *New Zealand Dental Journal*, 108(3), 83-88.



BRIAN MONK

BSc (Hons) (Well) PhD (Monash)

Oral Sciences

Senior Lecturer

It is imperative that new ways are discovered to combat infectious disease, especially where clinically significant drug resistance has emerged. Dr Monk uses molecular genetic manipulation of yeast and bacterial systems to express drug targets for effective screening of compound libraries. 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 fungal transcription factors and enzymes involved in fungal riboflavin biosynthesis. For example, we recently determined the X-ray structure of the riboflavin biosynthetic enzyme lumazine synthase from the fungal pathogen *Candida glabrata*. The challenge of obtaining monodisperse membrane proteins for structural resolution by X-ray crystallography is well advanced. The structure of yeast lanosterol 14 α -demethylase has been determined and other targets of interest are in crystal trials. The yeast expression system patented by Dr Monk 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 and overcoming mechanisms of echinocandin, anthelmintic 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) are applied to anti-infective discovery – an area neglected by the pharmaceutical industry. Specific inhibitors of drug efflux pumps have been obtained and tested in an animal model and multifunctional azoles 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 (artemisinin) antimalarials, identifying broad spectrum fungicides using essential, structurally resolved, antifungal targets, and facilitating drug discovery by crystallizing membrane protein and soluble antimicrobial targets. Other research has applied proteomics to tooth development and enamel strength, aims to define the requirements for heterologous expression in yeast of human ABCG2 (a marker of breast cancer refractory to chemotherapy), and measured anti-infective-surface interactions.

Dr Monk leads multiple projects in the Molecular Microbiology Laboratory (MML) headed by Prof. Richard Cannon. This includes collaboration with team of post-doctoral fellows (Dr A Holmes, Dr E Lamping, Dr K Niimi, Dr M Keniya) studying antifungal drug targets, drug efflux mechanism responsible for antifungal resistance and heterologous expression of membrane proteins. A Marsden Fund grant to Dr Monk entitled "Multifunctional azoles: A triple whammy designed to defeat drug resistance" is using structural and functional analysis to characterize antifungal drug targets and identify new drugs not susceptible to drug resistance. This involves an international research team that includes Prof. A. Goffeau (University Catholique de Louvain, Belgium), Prof. R Stroud (University of California at San Francisco), Dr E. Fleischer and Dr A Klinger (MicroCombiChem, Weisbaden, Germany), Dr D Maas (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) has determined the molecular basis of echinocandin resistance in *C. albicans* and *C. glabrata*. Since 2010 Dr Monk has been involved in a FRST (now MBIE)-supported collaboration with Dr K Niimi, Prof Cannon and Dr S Bisset of AgResearch aimed at overcoming nematode resistance to drenches. Dr Monk has collaborated with Dr Tyndall on the structure and function of proteins involved in fungal riboflavin biosynthesis, and with Assoc. 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

Niimi, K., Harding, D. R. K., Holmes, A. R., Lamping, E., Niimi, M., Tyndall, J., Cannon, R. D., Monk, B. C. (2012). Specific interactions between the *Candida albicans* ABC transporter Cdr1p ectodomain and a D-octapeptide derivative inhibitor. *Molecular Microbiology*, 85(4), 747-767. doi: 10.1111/j.1365-2958.2012.08140.x.

Niimi, K., Woods, M. A., Maki, K., Nakayama, H., Hatakenaka, K., Chibana, H., Niimi, M., Cannon, R. D., Monk, B. C. (2012). Reconstitution of high-level micafungin resistance detected in a clinical isolate of *Candida glabrata* identifies functional homozygosity in glucan synthase gene expression. *Journal of Antimicrobial Chemotherapy*, 67(7), 1666-1676. doi: 10.1093/jac/dks112.

Hayama, K., Ishibashi, H., Ishijima, S. A., Niimi, K., Tansho, S., Ono, Y., Monk, B. C., Holmes, A. R., Cannon, R. D., Abe, S. (2012). A D-octapeptide drug efflux pump inhibitor acts synergistically with azoles in a murine oral candidiasis infection model. *FEMS Microbiology Letters*, 328(2), 130-137. doi: 10.1111/j.1574-6968.2011.02490.x.

Tanabe, K., Lamping, E., Nagi, M., Okawada, A., Holmes, A. R., Miyazaki, Y., Cannon, R. D., Monk, B. C., Niimi, M. (2011). Chimeras of *Candida albicans* Cdr1p and Cdr2p reveal features of pleiotropic drug resistance transporter structure and function. *Molecular Microbiology*, 82(2), 416-433. doi: 10.1111/j.1365-2958.2011.07820.x.



KATE C MORGAINE

BA (Canterbury) Dip Tchg (Sec) MPH (Otago), PhD (Otago)

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:

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 (University of Adelaide) and Canada (Universities of Toronto, Winnipeg and Manitoba).

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.

Kate supervises a number of students within the Faculty of Dentistry (PhD, DClintDent, MComDent) and in the Dept of Preventive and Social Medicine (MPH, MHSci). The topics include intervention evaluation, health services research and occupational safety and health. Methodological advice includes programme evaluation and qualitative research methods.

Recent Publications

Soma, K. J., Thomson, W. M., Morgaine, K. C., & Harding, W. J. (2012). A qualitative investigation of specialist orthodontists in New Zealand. Part 1. Orthodontists and orthodontic practice. *Australian Orthodontic Journal*, 28(1), 2-16.

Buxcey, A. J., Morgaine, K. C., Meldrum, A. M., & Cullinan, M. P. (2012). An exploratory study of the acceptability of delivering oral health information in community pharmacies. *New Zealand Dental Journal*, 108(1), 19-24.

Rothnie, J. J., Walsh, C. A., Wang, M. J.-J., Morgaine, K. C., & Drummond, B. K. (2012). An exploratory study of pregnant women's knowledge of child oral health care in New Zealand. *New Zealand Dental Journal*, 108(4), 129-133.

Bryant, S., McLaughlin, K., Morgaine, K., & Drummond, B. (2011). Elite athletes and oral health. *International Journal of Sports Medicine*, 32(9), 720-724. doi: 10.1055/s-0031-1277192.



DR KYOKO NIIMI

DVM (Nippon Vet) PhD (Otago)

Oral Sciences

Senior Research Fellow

Dr Niimi's research interests are in molecular microbiology, particularly in mycology research and the development of drug efflux pump inhibitors. Her three main areas of research expertise are the molecular biology of human fungal pathogens *Candida albicans* and *Candida glabrata*, the mechanisms of antifungal drug resistance, and heterologous protein expression in baker's yeast *Saccharomyces cerevisiae*.

Research and Collaboration

The scope of Dr Niimi's research in 2011 and 2012 covered three topics.

- (1) Investigating mechanisms of echinocandin resistance in the human fungal pathogen *C. glabrata*. A novel class of antifungal agent, the echinocandins, provides new therapeutic options for the treatment of systemic fungal infections. Although the incidence of echinocandin resistance remains low there is an increasing number of reports of echinocandin-resistant *C. glabrata* isolates from patients with treatment failure. Dr Niimi and her collaborators have found that high-level echinocandin resistance is acquired in a stepwise manner; it is therefore important to identify intermediate levels of resistance in clinical isolates from patients who have been treated previously with echinocandins. Key collaborators include Drs K. Maki and K. Hatakenaka (Astellas Pharma Inc., Japan); Assoc. Prof. H. Nakayama (Suzuka University of Medical Sciences, Japan); Assoc. Prof. H. Chibana (Chiba University, Japan); Dr M.A. Woods (Massey University); Drs M. Niimi, B.C. Monk and Prof. R.D. Cannon (Molecular Microbiology Laboratory, University of Otago).
- (2) Functional expression of nematode P-glycoproteins (P-gps) in *S. cerevisiae* for anthelmintic chemosensitiser discovery. Nematode infections of sheep and cattle are a major animal health concern for New Zealand farmers, and nematode drench resistance is increasing. The resistance can be due to the ability of nematodes to pump out the drench using P-gps. Dr Niimi and her collaborators have functionally expressed in *S. cerevisiae* three variations of P-gp9 from a pathogenic nematode *Teladorsagia circumcincta*, and two P-gps from the model nematode *Caenorhabditis elegans*. Using the yeast strains expressing those P-gps she is developing a screening platform to discover inhibitors of P-gps. Key collaborators include Dr S. Bisset (Agresearch Hopkirk Institute, Palmerston North); Drs B.C. Monk, M. Niimi and Prof. R.D. Cannon (Molecular Microbiology Laboratory, University of Otago).
- (3) Molecular analysis of *Candida albicans* ABC transporter Cdr1p. Resistance of *Candida albicans* to widely used azoles poses serious clinical problems, as *C. albicans* is the predominant cause of both oral and systemic fungal infections in immunocompromised individuals. The major mechanism of azole resistance in *C. albicans* is the overexpression of drug efflux pump Cdr1p. Dr Niimi has expressed *C. albicans* Cdr1p in baker's yeast to analyse the function of the pump protein, and investigated interactions between the pump and pump inhibitors. Key collaborators include Dr K. Tanabe (National Institute of Infectious Diseases, Tokyo, Japan); Drs B.C. Monk, M. Niimi, E. Lamping, A.R. Holmes, M.V. Keniya and Prof. R.D. Cannon (Molecular Microbiology Laboratory, University of Otago).

Recent Publications

Monk, B. C., Niimi, K., Holmes, A. R., Strouse, J. J., Sklar, L. A., & Cannon, R. D. (2012). Fungal efflux-mediated resistance: From targets to inhibitors. In G. Tegos & E. Mylonakis (Eds.), *Antimicrobial drug discovery: Emerging strategies* (pp. 77-88). Oxford, UK: CABI.

Niimi, K., Harding, D. R. K., Holmes, A. R., Lamping, E., Niimi, M., Tyndall, J., Cannon, R. D., Monk, B. C. (2012). Specific interactions between the *Candida albicans* ABC transporter Cdr1p ectodomain and a D-octapeptide derivative inhibitor. *Molecular Microbiology*, 85(4), 747-767. doi: 10.1111/j.1365-2958.2012.08140.x.

Niimi, K., Woods, M. A., Maki, K., Nakayama, H., Hatakenaka, K., Chibana, H., Niimi, M., Cannon, R. D., Monk, B. C. (2012). Reconstitution of high-level micafungin resistance detected in a clinical isolate of *Candida glabrata* identifies functional homozygosity in glucan synthase gene expression. *Journal of Antimicrobial Chemotherapy*, 67(7), 1666-1676. doi: 10.1093/jac/dks112.

Hayama, K., Ishibashi, H., Ishijima, S. A., Niimi, K., Tansho, S., Ono, Y., Monk, B. C., Holmes, A. R., Cannon, R. D., Abe, S. (2012). A D-octapeptide drug efflux pump inhibitor acts synergistically with azoles in a murine oral candidiasis infection model. *FEMS Microbiology Letters*, 328(2), 130-137. doi: 10.1111/j.1574-6968.2011.02490.x.

Awards for 2011 and 2012

Poster Award at the 18th Congress for International Society for Human and Animal Mycology, Berlin, Germany (June 2012).

Sir John Walsh Research Institute Basic Science Research Award (December 2011).



ALISON RICH

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

Professor Rich's research interests relate to gaining a greater understanding of the pathogenesis of oral diseases to complement my clinical speciality of diagnostic oral pathology. Her main research interest is in oral cancer, particularly developing tools to more accurately predict the transformation of potentially malignant oral diseases to oral cancer and, more recently, investigation the role of immune cells in the oral cancer environment. She has expertise in project design in these areas, in data analysis and in mentoring colleagues and post- and undergraduate students undertaking related projects. Specialist techniques include light microscopic analysis, immuno-fluorescence microscopy, immunohistochemistry and histomorphometric analysis. More recently she has used polymerase chain reaction and array technology. Professor Rich's contribution to dental research has been recognised by being invited in 2010 to become a member of the Board of the New Zealand Dental Association Research Foundation. She is a co-leader of the Immunopathology Programme of the Sir John Walsh Research Institute.

Professor Rich's research also relates to her activities as Associate Dean -Undergraduate Studies (Dentistry) where she has been involved in curriculum review emphasising research-supported undergraduate teaching and learning. She instigated research into evaluation of undergraduate selection tools and evaluation of curriculum innovations, particularly the outplacement of senior dental students with Maori oral health providers. As well, she is part of a national team investigating dental work force issues in New Zealand.

Research and Collaboration

2011- present: Research collaboration with Associate Professor T Winning, Dr D Lekkas & Professor G Townsend, University of Adelaide working together on project "Do multifaceted admission processes predict performance of students in two Australasian dental programmes?" with funding from the Australian Council of Educational Research.

2010- present: Research collaboration with Dr Vivienne Anderson, Dept of Education, Uni Otago, Professor John Broughton & Dr Pauline Koopu, President Te Ao Marama, (Māori Dental Association) working on funded project 'Oranga niho, oranga tinana, oranga whānau': examining student outplacements with Māori Oral Health Providers.

2008-present: Research collaboration with Professor R Zain & colleagues, University of Malaya. Joint projects with the Oral Cancer Research and Co-ordinating Centre.

Recent Publications

Ng, L. K., Rich, A. M., Hussaini, H. M., Thomson, W. M., Fisher, A. L., Horne, L. S., & Seymour, G. J. (2011). Toll-like receptor 2 is present in the microenvironment of oral squamous cell carcinoma. *British Journal of Cancer*, 104(3), 460-463. doi: 10.1038/sj.bjc.6606057.

Hussaini, H. M., Waddell, J. N., Girvan, L., West, L. M., Kardos, T. B., Rich, A. M., & Seymour, G. J. (2011). Silver solder "tattoo": A novel form of oral pigmentation identified with the use of field emission scanning electron microscopy and electron dispersive spectroscopy. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, & Endodontology*, 112(4), e6-e10. doi: 10.1016/j.tripleo.2011.03.049.

Rich, A. M., Ayers, K. M. S., Thomson, W. M., Sinclair, R. J., Rohan, M. J., & Seymour, G. J. (2012). Does performance in selection processes predict performance as a dental student? *European Journal of Dental Education*, 16(1), 27-34. doi: 10.1111/j.1600-0579.2011.00706.x.

Desai, S.V., Love, R. M., Rich, A. M., & Seymour, G. J. (2011). Toll-like receptor 2 expression in refractory periapical lesions. *International Endodontic Journal*, 44(10), 907-916. doi: 10.1111/j.1365-2591.2011.01893.x.

Desai, S.V., Love, R. M., Rich, A. M., & Seymour, G. J. (2011). Antigen recognition and presentation in periapical tissues: A role for TLR expressing cells? *International Endodontic Journal*, 44(2), 87-99. doi: 10.1111/j.1365-2591.2010.01817.x.



DONALD SCHWASS

BSc (Waik) BDS DClinDent (Otago) FPFA

Oral Rehabilitation

Senior Lecturer

Dr Schwass's research interests focus on the assessment and application of diagnostic tools for cariology, the management of dental caries, and the use of micro-CT (micro-computer tomography) and CBCT (cone beam computer tomography) for evaluation of mineralised tissues. In collaboration with Dr Carla Meledandri (Chemistry, University of Otago), he has developed several methods for size-controlled synthesis of micelle-stabilised silver nanoparticles, engineered for optimal antimicrobial and optical properties, specifically designed for application on teeth to prevent, control progression, or eliminate, dental caries. In January 2013 a provisional patent application was filed pertaining to the 'assembly of micelle aggregates of surfactant micelles and silver nanoparticles, and use as an antibacterial agent'. Working with Dr Meledandri, and with support from Otago Innovation Ltd, he is currently seeking engagement from a commercial partner to further develop this novel treatment into a marketable dental product.

Dr Schwass is enrolled in a PhD (part-time) relating to his work with silver nanoparticles, and is an advisor for several other PhD students providing technical support on micro-CT and CBCT. He also contributes as a researcher in a randomised controlled clinical trial exploring the efficacy of resin infiltration as a means of inhibiting caries progression in children providing microscopy and technical support, collaborating with other department academic staff.

Research and collaboration

Current research collaborations include:

Development of novel micelle-stabilised silver nanoparticles for application on teeth to prevent, control progression, or eliminate, dental caries. Collaborators: Dr Carla Meledandri (Chemistry Department), Professor Jules Kieser, Professor Michael Swain, Dr Geoffrey Tompkins.

Clinical trial exploring the efficacy of resin infiltration of non-cavitated proximal caries lesions in deciduous teeth, delivered in a community setting. Collaborators: Dr Lyndie Foster Page, Alison Meldrum, Professor Michael Swain, Professor W. Murray Thomson and DMG (Germany).

Comparing teeth from several freshwater and marine dolphinid cetaceous dentitions, with those from the human dentition utilising micro-CT to characterise mineral structural composition. Collaborators: Carolina Loch Santos Da Silva, Professor Jules Kieser, Professor R. Ewan Fordyce (Geology Department).

Measurement of craniometric and soft tissue depths from virtual digital images of CBCT scans relating to the heads of living persons. Collaborators: Louisa Baillie and Dr George Dias (Department of Anatomy), Dr Phil Blyth (Faculty of Medicine).

Recent publications

Schwass, D. R., Lyons, K. M., & Purton, D. G. (2013). How long will it last? The expected longevity of prosthodontics and restorative treatment. *New Zealand Dental Journal* 109: September (in press).

Garden, A. L., van der Salm, L., Schwass, D. R., & Meledandri, C. J. (2013). Towards a tunable microemulsion method for nanoparticle synthesis. *RSC Advances* 3, 2192-2196 DOI: 10.1039/C2RA21491A.

Schwass, D. R., Leichter, J. W., Purton, D. G., & Swain, M. V. (2012). Evaluating the efficiency of caries removal using an Er:YAG laser driven by fluorescence feedback control. *Archives of Oral Biology* AOB-D-12-00295.

Schwass D. R. & Meledandri C. J. (2013). Assembly of micelle aggregates of surfactant micelles and silver nanoparticles and use as an antibacterial agent. US patent application 61/756681 AU application 2013900226 Date of filing 25 January 2013.



GREGORY SEYMOUR

AM FRSNZ BDS (Hons) MDSc (Syd) PhD (Lond) FRCPath FFOP(RCPA) FRACDS(Perio) FICD
FADI FPFA

Oral Sciences

Professor of Periodontology

Dean, Faculty of Dentistry

Professor Seymour's research has 2 major themes: the relationship between oral disease and systemic conditions, primarily atherosclerosis and the immunopathology of periodontal and oral mucosal diseases using immunological and molecular techniques. In terms of the relationship between periodontal disease and atherosclerosis, this research has focused on molecular mimicry as the link between the two diseases and is the focus of a major collaboration with the University of Queensland, Australia and the University of Niigata, Japan. In terms of the immunopathology of oral diseases, Professor Seymour's focus is on relating the nature of the inflammatory infiltrate together with the cytokine and gene expression profiles. An emerging theme in his research is the effect of environmental factors such as smoking and the use of bisphosphonates on gingival gene expression profiles.

Research and Collaboration

Over the 2011 – 2012 period as part of the ongoing collaboration with the University of Queensland School of Medicine, Professor Seymour and co-workers investigated the contribution of the oral pathogen load to the total burden of infection and the levels of serum antibody to human Heat Shock Proteins in a cardiovascular disease population. In this context they demonstrated that the level of periodontal pathogens and the presence of periodontal disease contributed significantly to the levels of anti-hHSP antibodies which in turn had previously been associated with a high degree of mortality. This data therefore strongly supported the concept that patients with cardiovascular disease should be referred for an oral assessment.

The longitudinal clinical study on the effect of a triclosan toothpaste on the progression of periodontal disease in a cardiovascular disease population (CAPS) which is being carried out in collaboration with the School of Medicine at the University of Queensland showed that this did not lead to thyroid dysfunction as had previously been proposed.

During this period the group were also able to show that the so-called Th17 subset of T cells were not significant in periodontal disease, nor in oral lichen planus, and that the major source of IL-17 in these conditions was in fact mast cells. This was a totally new finding, and significantly questions the concept that Th17 cells are major contributors to disease progression.

In addition, work from Professor Seymour's laboratory shown that bisphosphonates influence angiogenic gene expression in human gingival fibroblast and osteoblast cultures.

Recent Publications

Ng, L. K., Rich, A. M., Hussaini, H. M., Thomson, W. M., Fisher, A. L., Horne, L. S., & Seymour, G. J. (2011). Toll-like receptor 2 is present in the microenvironment of oral squamous cell carcinoma. *British Journal of Cancer*, 104(3), 460-463. doi: 10.1038/sj.bjc.6606057.

Rose-Hill, S., Ford, P. J., Leishman, S. J., Do, H. L., Palmer, J. E., Heng, N. C. K., Seymour, G. J., Cullinan, M. P. (2011). Improved periodontal health and cardiovascular risk. *Australian Dental Journal*, 56(4), 352-357. doi: 10.1111/j.1834-7819.2011.01363.x.

Cullinan, M. P., Palmer, J. E., Carle, A. D., West, M. J., & Seymour, G. J. (2012). Long term use of triclosan toothpaste and thyroid function. *Science of the Total Environment*, 416, 75-79. doi: 10.1016/j.scitotenv.2011.11.063.

Leishman, S. J., Ford, P. J., Do, H. L., Palmer, J. E., Heng, N. C. K., West, M. J., Seymour, G. J., Cullinan, M. P. (2012). Periodontal pathogen load and increased antibody response to heat shock protein 60 in patients with cardiovascular disease. *Journal of Clinical Periodontology*, 39(10), 923-930. doi: 10.1111/j.1600-051X.2012.01934.x.



DARA SHEARER

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

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.

The epidemiology of intergenerational associations in periodontal health

Description: Longitudinal observational research investigating the role of family history in periodontal health. Longitudinal parental-proband associations are examined using phase 26, phase 32 and phase 38 periodontal data from the Dunedin Study, and parental data from the Dunedin Family History Study conducted in 2004. This research involves the use of group-based trajectory modelling to establish whether an unfavourable periodontal trajectory is linked to parental periodontal history.

Aim: To elucidate longitudinal associations between parental and cohort periodontal health.

Longitudinal associations between periodontal disease and glycaemic control

Description: The investigation of longitudinal and bidirectional associations between periodontal disease and glycaemic control. It involves the analysis of Dunedin Study periodontal and glycated haemoglobin assays collected from Study members during the age-26, age-32 and age-38 assessments. This research involves the use of group-based trajectory modelling which will identify development courses for both conditions, as well as converting complex data to a form easily understood by non-technical audiences.

Aim: To elucidate the natural history of, and the complex two-way associations and temporal relationship between, periodontal disease and glycaemia as the cohort moves through their third and fourth decades towards middle age.

Source of funding: HRC programme grant

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, D. M., Thomson, W. M., Broadbent, J. M., & Poulton, R. (2011). Maternal oral health predicts their children's caries experience in adulthood. *Journal of Dental Research*, *90*(5), 672-677. doi: 10.1177/0022034510393349

Shearer, D. M., Thomson, W. M., Broadbent, J. M., & Poulton, R. (2011). Does maternal oral health predict child oral health-related quality of life in adulthood? *Health & Quality of Life Outcomes*, *9*, 50. doi: 10.1186/1477-7525-9-50

Shearer, D. M., Thomson, W. M., Caspi, A., Moffitt, T. E., Broadbent, J. M., & Poulton, R. (2011). Inter-generational continuity in periodontal health: Findings from the Dunedin Family History Study. *Journal of Clinical Periodontology*, *38*(4), 301-309. doi: 10.1111/j.1600-051X.2011.01704.x

Shearer, D. M., Thomson, W. M., Caspi, A., Moffitt, T. E., Broadbent, J. M., & Poulton, R. (2012). Family history and oral health: Findings from the Dunedin Study. *Community Dentistry & Oral Epidemiology*, *40*(2), 105-115. doi: 10.1111/j.1600-0528.2011.00641.x.



MICHAEL SWAIN

BSc (Hons) PhD (NSW)
Oral Rehabilitation
Professor

Professor Swain is developing an understanding of the mechanical behaviour of biomaterials, including teeth, bone, soft tissues and dental restorative materials. By combining the ability to quantify microstructure, understand mechanics and conduct detailed property measurements, it is possible to define the behaviour of materials and systems.

Research and Collaboration

Over the past few years, Professor Swain has had three major research foci: (i) the mechanics and mechanisms of craniofacial structures and the failure of dental restorative systems, (ii) the microstructural and micromechanical properties of teeth, including the influence of disease (caries) and defective (hypoplasia) conditions; and (iii) remineralisation of enamel and dentine.

Research on the mechanics and mechanisms of the failure of dental restorative systems has used detailed knowledge of craniofacial biomechanics, including an effort to understand the role of the chin in modern man. The failure mechanisms of both restored teeth and overdenture-supported structures have been evaluated from detailed microstructure analysis using electron microscopy and finite element analysis. This research has been in collaboration with PhD students (Ionut Ichim and Neil Waddell) members of staff (Professor Jules Kieser and Associate Professor Alan Payne) and international collaborators (Dr Qing Li at the University of Sydney).

The microstructure and mechanical properties of teeth has been a long-term research interest. Nano-indentation is used to quantify the spatial dependence of the properties of enamel and dentine and determine how these properties vary throughout natural carious lesions in enamel and dentine. It has also involved a critical appraisal of the properties of hypo-plastic enamel. This research involves Dr Rami Farah (PhD student), and ongoing collaboration with Associate Professor Nicky Kilpatrick at the Melbourne Children's Hospital, Dr Erin Mahoney (Victoria University Wellington), and Associate Professor Bernadette Drummond (Oral Sciences).

The remineralisation and demineralization of enamel and dentine carious lesions have been the subject of collaborations with various groups including the University of Sydney, Dr Patrick Schmidlin (University of Zurich), and Dr Chris Sissons' Dental Research Group, Otago University (Wellington). This research has used microCT and nano-indentation to understanding the mineral gradients and mechanical properties in natural carious and artificial lesions, before and after various remineralisation procedures.

Recent Publications

Chang, C.W., Waddell, J. N., Lyons, K. M., & Swain, M.V. (2011). Cracking of porcelain surfaces arising from abrasive grinding with a dental air turbine. *Journal of Prosthodontics*, **20**(8), 613-620. doi: 10.1111/j.1532-849X.2011.00760.x

Allsobrook, O. F. L., Leichter, J., Holborow, D., & Swain, M. (2011). Descriptive study of the longevity of dental implant surgery drills. *Clinical Implant Dentistry & Related Research*, **13**(3), 244-254. doi: 10.1111/j.1708-8208.2009.00205.x

Choi, J. H., Waddell, J. N., Torr, B., & Swain, M.V. (2011). Pressed ceramics onto zirconia. Part I: Comparison of crystalline phases present, adhesion to a zirconia system and flexural strength. *Dental Materials*, **27**(12), 1204-1212. doi: 10.1126/science.1159584

Choi, J. E., Waddell, J. N., & Swain, M.V. (2011). Pressed ceramics onto zirconia: Part 2: Indentation fracture and influence of cooling rate on residual stresses. *Dental Materials*, **27**(11), 1111-1118. doi: 10.1016/j.dental.2011.08.003



ANDREW TAWSE-SMITH

DDS (Colom Sch Dent) Cert Periodontology (Goteborg)
Office of the Dean, Dentistry
Senior Lecturer

Andrew Tawse-Smith's research platform is based on clinical research in oral implantology, periodontology and dental education. He has been involved in the prospective evaluation of patients rehabilitated with oral implants. Selected peri-implant parameters have been measured to evaluate implant success/survival rates, health of peri-implant tissues and patient satisfaction. As a part of the University of Otago – International Medical University (IMU) BDS partnership agreement, he has evaluated the transition of IMU students into the University of Otago dental curriculum.

Research and Collaboration

In the area of oral implantology, Andrew Tawse-Smith has carried out clinical research evaluating biological implant complications and the presence/influence of titanium particles in peri-implant tissues. This has been done in collaboration with Liz Girvan (Microscopy Otago), Dr Sunyoung Ma and A/Prof Warwick Duncan (Faculty of Dentistry, University of Otago) and the International collaboration of Dr Haizal M. Hussaini (Faculty of Dentistry, National University of Malaysia).

Interdisciplinary research has been done on the effect of prosthodontic procedures on titanium implant surfaces in collaboration with Dr Vincent Bennani and Liz Girvan.

There is ongoing multicentre research involving the Colombian School of Dentistry (Colegio Odontologico Colombiano) of UNICOC University, ACTA (Netherlands) and the University of Otago evaluating dental/implant supported removable partial dentures.

In the area of dental education, there is collaboration with Dr Vivienne Anderson (University of Otago College of Education) and Prof Alison Rich, evaluating IMU students' reflections on their transition from IMU to Otago.

Recent Publications

Tawse-Smith, A., Ma, S., Siddiqi, A., Duncan, W. J., Girvan, L., & Hussaini, H. M. (2012). Titanium particles in peri-implant tissues: Surface analysis and histologic response [Case series]. *Clinical Advances in Periodontics*, 2(4), 232-238. doi: 10.1902/cap.2012.110081.

Peters, N., Tawse-Smith, A., Leichter, J., Tompkins, G. (2012) Laser therapy: The future of peri-implantitis management? *Brazilian Journal of Periodontology* 22, 26-33.

Chang, Y.-S. M., Bennani, V., Tawse-Smith, A., & Girvan, L. (2011). Effect of a cordless retraction paste material on implant surfaces: An *in vitro* study. *Brazilian Oral Research*, 25(6), 492-499. doi: 10.1590/S1806-83242011000600004.

Benic, G. Z., Tawse-Smith, A., & Bennani, V. (2011). Clinical implications of nanosurface technology on clinical success and survival rate of single implant restorations: A review. *Revista Periodontia*, 21(1), 55-64.



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 published output includes 217 papers in the peer-reviewed international scientific literature to date. His research falls into the 4 categories of (1) life-course epidemiology and longitudinal research, (2) periodontal epidemiology and risk factors, (3) gerodontology research, and (4) dental public health and health services research.

Research and Collaboration

During the 2011-2012 period, Professor Thomson published 45 papers in the peer-reviewed international literature, along with one book chapter; and made (or was a co-author on) 15 conference presentations. Notable achievements during that time were: the completion of age-38 assessments of Study members in the Dunedin Multidisciplinary Health and Development Study; the awarding of 7 research grants (including a Programme Grant Extension of more than \$1 million from the Health Research Council of NZ; and the supervision to completion of 7 Doctoral and 6 Masters students. He also edited the 8 issues of the New Zealand Dental Journal for that period, and was appointed to Associate Editor of Gerodontology from January 2012.

Specific areas of research (with a range of NZ and international collaborators) included: ongoing work in the Dunedin Multidisciplinary Health and Development Study; continued health services research work in the development, testing and field use of OHRQoL measures; general dental epidemiology research and commentary; and dental educational research.

Recent Publications

Thomson, W. M., Mejia, G. C., Broadbent, J. M., & Poulton, R. (2012). Construct validity of Locker's global oral health item. *Journal of Dental Research*, 91(11), 1038-1042. doi: 10.1177/0022034512460676.

Thomson, W. M., & Malden, P. E. (2011). Assessing change in the family impact of caries in young children after treatment under general anaesthesia. *Acta Odontologica Scandinavica*, 69, 257-262. doi: 10.3109/00016357.2011.554862.

Thomson, W. M., Caspi, A., Poulton, R., Moffitt, T. E., & Broadbent, J. M. (2011). Personality and oral health. *European Journal of Oral Sciences*, 119(5), 366-372. doi: 10.1111/j.1600-0722.2011.00840.x.

Thomson, W. M., van der Putten, G.-J., de Baat, C., Ikebe, K., Matsuda, K.-i., Enoki, K., Ling, G. Y. (2011). Shortening the Xerostomia Inventory. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, & Endodontology*, 112(3), 322-327. doi: 10.1016/j.tripleo.2011.03.024.



GEOFFREY TOMPKINS

BSc PGDipSc PhD (Otago)
Oral Sciences
Senior Lecturer

As a microbiologist employed in the Faculty of Dentistry, Dr Tompkins' research is focused on dental microbiology. Much of his research involves providing microbiological support in collaborative studies with clinicians undertaking applied research, because most of our postgraduate students are involved in clinical (or translational) research (and do not have the background and training for more fundamental microbiology research). As such, Dr Tompkins' research platform is highly varied, having been involved in dental forensics, endodontic, implant, restorative and proprietary (AgResearch) research. His work on bite mark analysis (forensics) is recognized internationally to the point that he has twice been invited to contribute to what is currently regarded as the definitive publication in the field; the significance of his bite mark research was acknowledged in *The Lancet* (2006). A more recent publication describing a convenient and rapid method to quantify bacterial survival in dentinal tubules following endodontic treatment promises a significant technical advance in the field. Dr Tompkins has found a particular interest in supporting undergraduate dental students in their initial research experiences, through his role as coordinator of the BDS 5th year Research Module; a responsibility that often requires him to supervise more student projects than the majority of faculty members. In addition, throughout my 14 years at Otago, he has supervised at least one undergraduate summer student each year, and in this time three peer-reviewed publications have developed with a summer student as the first author.

Research and Collaboration

Dr Tompkins' principal collaboration is with Dr Jo-Ann Stanton (Dept. Anatomy, University of Otago), director of the high-throughput sequencing facility. This research assesses the feasibility of genotypically matching oral bacteria deposited in bite marks with those from the teeth of the biter. He and Dr Stanton co-supervised PhD student Darnell Kennedy who submitted her thesis in April 2013 and published a report of her research (Kennedy *et al.*, *PLoS One* 7:e51757 (2012)).

Another productive collaboration has been with Associate Professor Nicholas Chandler, Dr Jonathan Leichter and Mrs Tina Hauman, resulting in several publications examining the distribution and viability of bacteria in endodontic tubules [Aziz *et al.*, *J. Endod.* 38(10) 1387-1390 (2012); Russell *et al.*, *J. Endod.* 39:208-10 (2012); Parmar *et al.*, *Int. Endodont. J.* 44 (7) 644 – 651 (2011)].

Recent Publications

Kennedy, D. M., Stanton, J. A., Garcia, J. A., Mason, C., Rand, C. J., Kieser, J. A., and Tompkins, G. R. (2012). Microbial analysis of bite marks by sequence comparison of streptococcal DNA. *PLoS One* 7:e51757.

Aziz, A., Chandler, N. P., Hauman, C. H. J., Leichter, J. W., McNaughton, A., & Tompkins, G. R. (2012) Infection of apical dentin and root-end cavity disinfection. *Journal of Endodontics* 38(10) 1387-1390.

Hsu, L., Power, D., Upritchard, J., Burton, J., Friedlander, R., Horswell, J., Macdonald, C., Kieser, J., and Tompkins, G. (2012) Amplification of oral streptococcal DNA from human incisors and bite marks. *Current Microbiology* 65:207-11.

Parmar, D., Hauman, C. H. J., Leichter, J. W., McNaughton, A., & Tompkins, G. R. (2011) Bacterial localisation and viability assessment in human ex vivo dentinal tubules by fluorescence laser scanning confocal microscopy. *International Endodontic Journal* 44 (7) 644 – 651 (2011).



DARRYL TONG

BDS MB ChB (Otago) MSD CertOMS (Wash) FFDRCSI FDSRCS FACOMS MRSNZ
 Oral Diagnostic and Surgical Sciences
 Associate Professor

Clinical and systematic review- based research in oral and maxillofacial surgery including dentoalveolar surgery, pathology, trauma, dental implantology and other clinical aspects of the specialty. Of particular interest however is maxillofacial trauma and ballistic injury especially in theatres of conflict. Currently enrolled in PhD looking at war injuries of the face and jaws from an integrated historical and surgical viewpoint. Other research interests include forensic biology, subconcussive injury using a forensic head model system and veterans' health research topics.

Research and Collaboration

In addition to PhD research, the following collaborative research is undertaken:

Primary investigator for head impact and subconcussive injury in kendo using a forensic head model system. Collaboration with the UO forensic biology group, Kansai University, Osaka and Tokyo University of Agriculture and Technology, Japan.

Primary investigator and student research supervisor for oral health longitudinal study among elderly military veterans at Montecillo Veterans' Hospital and Rest Home

Co-investigator for morbidity and mortality study among Viet Nam War veterans in collaboration with Dr David McBride and Assoc Professor Brian Cox and Professor John Broughton from Preventive and Social Medicine. This is an invited research study under the auspices of Veterans Affairs New Zealand (VANZ) and the Ministerial Advisory Group on Veterans Health.

Co-investigator; University of Otago Veterans' Health Research Group collaboration with the Centre of Military and Veterans Health in Australia investigating and fostering multiple research initiatives including veterans' health, mental health issues, epidemiological studies and oral health needs. This is part of a larger research initiative in Australia directed towards the centenary of the ANZAC landings in Gallipoli in 2015 (<http://www.otago.ac.nz/veteranshealth/>)

Co-investigator; Occupational Health of Front Line Workers research group (Dr Kirsten Lovelock PI) studying the health effects of frontline workers involved in the February 2011 Christchurch earthquake and how social networks, workplace culture, culture and ethnicity for these workers, in this disaster environment, influence vulnerability and resilience after the event. A Lottery Health Board grant of \$45,000 was awarded to the research group for 2013.

Inventor and principal investigator (in conjunction with Mr Neil Waddell and Otago Innovation) for the Temporary Inter Maxillary Stabilisation (TIMS) device for maxillofacial trauma and airway management. This project has been awarded a US provisional patent (61/149822) and a PCT has been filed in Feb 2010 (PCT/NZ2010/000015). Further negotiations for commercialization with interested third parties are currently ongoing.

Recent Publications

Tong, D. C. & Beirne, O. R. (2012) Combat Body Armor and the increased incidence of head, face and neck injuries: A systematic review. *Military Medicine* 178: 421-426.

Choi, H. J., De Silva, R. K., Tong, D. C., & De Silva, H. L. (2012) The thickness of parietal bones in a New Zealand sample of cadaveric skulls in relation to calvarial bone grafting. *Journal of Craniomaxillofacial Trauma and Reconstruction* (doi: <http://dx.doi.org/10.1055/s-0033-1343788>).

Cutfield, N.J., & Tong, D.C. (2012) Common medications among dental outpatients: considerations in general dental practice. *New Zealand Dental Journal* 108: 140-147.

Goldsmith, S., Love, R. M., De Silva, R. K. & Tong, D. C. (2011) Influence of a pedicle flap on acute post operative sequelae after lower third molar removal. *International Journal of Oral and Maxillofacial Surgery* (doi:10.1016/j.ijom.2011.08.006. Epub2011 Oct 25)



J. NEIL WADDELL

HDE (UN) MDipTech(DentTech) (TN) PGDipCDTech PhD(Otago)

Oral Rehabilitation

Senior Lecturer

Dr Waddell conducts experimental and observational research in cranio-facial biomechanics, with a special focus on prosthodontics (failure mechanisms and adhesion of dental restorations and materials), forensic science (in vitro modelling of blunt force trauma, forensic odontology, wounding and ballistic blood splatter analysis) and intra-oral pressure dynamics.

Research and Collaboration

Dr Waddell currently collaborates with people within a number of Sir John Walsh Research Institute research groups led by Professor Michael Swain, Professor Jules Kieser and Associate Professor Warwick Duncan. He has external links with the University of Auckland (Prof Andrew Pullan [sadly passed away, March 2012]) University of Stuttgart (Prof Oliver Rohle) and the Forensic Science Department of Environmental Science and Research (Dr. Michael Taylor).

Recent Publications

Choi, J. H., Waddell, J. N., Torr, B., & Swain, M.V. (2011). Pressed ceramics onto zirconia. Part 1: Comparison of crystalline phases present, adhesion to a zirconia system and flexural strength. *Dental Materials*, 27(12), 1204-1212. doi: 10.1126/science.1159584.

Choi, J. E., Waddell, J. N., & Swain, M.V. (2011). Pressed ceramics onto zirconia: Part 2: Indentation fracture and influence of cooling rate on residual stresses. *Dental Materials*, 27(11), 1111-1118. doi: 10.1016/j.dental.2011.08.003.

Benjamin, O., Silcock, P., Kieser, J. A., Waddell, J. N., Swain, M.V., & Everett, D.W. (2012). Development of a model mouth containing an artificial tongue to measure the release of volatile compounds. *Innovative Food Science & Emerging Technologies*, 15, 96-103. doi: 10.1016/j.ifset.2012.03.004

Bolter, C., Raniga, N., Waddell, J. N., & Kieser, J. (2012). Conservation of intraoral pressure changes during swallowing. *Journal of Dental Sciences*. Advance online publication. doi: 10.1016/j.jds.2012.09.016

Abduo, J., Lyons, K., Waddell, N., Bennani, V., & Swain, M. (2012). A comparison of fit of CNC-milled titanium and zirconia frameworks to implants. *Clinical Implant Dentistry & Related Research*, 14(Suppl. 1), e20-e29. doi: 10.1111/j.1708-8208.2010.00334.x

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SIR JOHN WALSH RESEARCH INSTITUTE

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2011 Publications

OFFICE OF THE DEAN (DENTISTRY)

Journal - Research Article

- Anderson, V. R., Rich, A. M., & Seymour, G. J. (2011). Undergraduate dental education in New Zealand: 2007-2009 final-year student feedback on clinical learning environments. *New Zealand Dental Journal*, 107(3), 85-90.
- Benic, G. Z., Tawse-Smith, A., & Bennani, V. (2011). Clinical implications of nanosurface technology on clinical success and survival rate of single implant restorations: A review. *Revista Periodontia*, 21(1), 55-64.
- Campbell, D. I., De Silva, R. K., De Silva, H., Sinon, S. H., & Rich, A. M. (2011). Temporomandibular joint synovial chondromatosis with intracranial extension: A review and observations of patient observed for 4 years. *Journal of Oral & Maxillofacial Surgery*, 69(8), 2247-2252. doi: 10.1016/j.joms.2010.10.042
- Chang, Y.-S. M., Bennani, V., Tawse-Smith, A., & Girvan, L. (2011). Effect of a cordless retraction paste material on implant surfaces: An *in vitro* study. *Brazilian Oral Research*, 25(6), 492-499. doi: 10.1590/S1806-83242011000600004
- Desai, S. V., Love, R. M., Rich, A. M., & Seymour, G. J. (2011). Antigen recognition and presentation in periapical tissues: A role for TLR expressing cells? *International Endodontic Journal*, 44(2), 87-99. doi: 10.1111/j.1365-2591.2010.01817.x
- Desai, S. V., Love, R. M., Rich, A. M., & Seymour, G. J. (2011). Toll-like receptor 2 expression in refractory periapical lesions. *International Endodontic Journal*, 44(10), 907-916. doi: 10.1111/j.1365-2591.2011.01893.x
- Friedlander, L., & Anderson, V. (2011). A new predoctoral endodontic module: Evaluating learning and effectiveness. *Journal of Dental Education*, 75(3), 351-359.
- Hussaini, H. M., Waddell, J. N., Girvan, L., West, L. M., Kardos, T. B., Rich, A. M., & Seymour, G. J. (2011). Silver solder "tattoo": A novel form of oral pigmentation identified with the use of field emission scanning electron microscopy and electron dispersive spectrography. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, & Endodontology*, 112(4), e6-e10. doi: 10.1016/j.tripleo.2011.03.049
- Jack, H. C., Antoun, J. S., & Fowler, P. V. (2011). Evaluation of primary surgical outcomes in New Zealand patients with unilateral clefts of the lip and palate. *Australian Orthodontic Journal*, 27(1), 23-27.
- Kieser, J. A., Tahere, J., Agnew, C., Kieser, D. C., Duncan, W., Swain, M. V., & Reeves, M. T. (2011). Morphoscopic analysis of experimentally produced bony wounds from low-velocity ballistic impact. *Forensic Science, Medicine, & Pathology*, 7(4), 322-332. doi: 10.1007/s12024-011-9240-y
- McGettigan, A., Timmins, K., Herbison, P., Liversidge, H., & Kieser, J. (2011). Wisdom tooth formation as a method of estimating age in a New Zealand population. *Dental Anthropology*, 24(2-3), 33-41.
- Ng, L. K., Rich, A. M., Hussaini, H. M., Thomson, W. M., Fisher, A. L., Horne, L. S., & Seymour, G. J. (2011). Toll-like receptor 2 is present in the microenvironment of oral squamous cell carcinoma. *British Journal of Cancer*, 104(3), 460-463. doi: 10.1038/sj.bjc.6606057
- Po, J. M. C., Kieser, J. A., Gallo, L. M., Tésenyi, A. J., Herbison, P., & Farella, M. (2011). Time-frequency analysis of chewing activity in the natural environment. *Journal of Dental Research*, 90(10), 1206-1210. doi: 10.1177/0022034511416669
- Rose-Hill, S., Ford, P. J., Leishman, S. J., Do, H. L., Palmer, J. E., Heng, N. C. K., Seymour, G. J., Cullinan, M. P. (2011). Improved periodontal health and cardiovascular risk. *Australian Dental Journal*, 56(4), 352-357. doi: 10.1111/j.1834-7819.2011.01363.x
- Siddiqi, A., Payne, A. G. T., De Silva, R. K., & Duncan, W. J. (2011). Titanium allergy: Could it affect dental implant integration? *Clinical Oral Implants Research*, 22(7), 673-680. doi: 10.1111/j.1600-0501.2010.02081.x
- Sinon, S. H., Rich, A. M., Hussaini, H. M., Yoon, H.-S., Firth, N. A., & Seymour, G. J. (2011). Metastases to the oral region from pleural mesothelioma: Clinicopathologic review. *Head & Neck*. Advance online publication. doi: 10.1002/hed.21942
- Sosroseno, W., Bird, P. S., & Seymour, G. J. (2011). Nitric oxide production by a murine macrophage cell line (RAW264.7 cells) stimulated with *Aggregatibacter actinomycetemcomitans* surface-associated material. *Anaerobe*, 17(5), 246-251. doi: 10.1016/j.anaerobe.2011.06.006

Journal - Professional & Other Non-Research Articles

Kieser, J. (2011). Social accountability and dental research [Guest editorial]. *New Zealand Dental Journal*, 107(3), 73.

Conference Contribution - Published proceedings: Full paper

Benjamin, O., Silcock, P., Kieser, J., Beauchamp, J., Buettner, A., & Everett, D.W. (2011). Development of model mouth to investigate the dynamic release of volatile compounds under artificial tongue pressure. In illycaffè & Forumeditrice (Eds.), *Proceedings of the 2nd MS Food Day*, (pp. 45-46).

Conference Contribution - Published proceedings: Abstract

Allothmani, O. S., Chandler, N. P., Friedlander, L.T., & Monteith, B. D. (2011). Influence of clinical experience on the accuracy and consistency of estimating radiographic working length adjustment. *International Endodontic Journal*, 44(12), (pp. 1182-1183). doi: 10.1111/j.1365-2591.2011.01914.x

Anderson, V., Burnett, G., Furnari, M., & Cushen, J. (2011). Teaching, learning and internationalisation [Panel discussion]. In K. Shephard, T. Harland, & A. Cohen (Eds.), *Proceedings of the Spotlight on Teaching and Learning Colloquium*, (pp. 11). Dunedin, New Zealand: HEDC, University of Otago.

Batra, A., Drummond, B., Swain, M., & Kieser, J. (2011). Effect of sodium hypochlorite and CPP-ACP on hypomineralised enamel in molar incisor hypomineralisation (MIH). *New Zealand Dental Journal*, 107(4), (pp. 136).

Batra, A., Drummond, B., Swain, M., & Kieser, J. (2011). Effect of NaOCl and ToothMousse™ on hypomineralised enamel in MIH. *Journal of Dental Research*, 90(Spec Iss B), 154488. Retrieved from <http://www.dentalresearch.org>.

Belli, R., Frankenberger, R., Tholey, M., Appelt, A., Schmitt, J., Monteiro, S., Lohbauer, U. (2011). Thermal-induced residual stresses affect longevity of zirconia crowns. *Journal of Dental Research*, 90(Spec Iss A), 34. Retrieved from <http://www.dentalresearch.org>.

Blakey, A., Harland, T., & Kieser, J. (2011). Experience of critical thinking, critical action and critical being in health science tutorials. *New Zealand Dental Journal*, 107(4), (pp. 135).

Bushby, S. K., Thomas, N., Coulter, C.V., & Kieser, J. (2011). Forensic investigations of a psychotropic drug using maggots in a brain model. *Proceedings of the Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists (ASCEPT) and Carney Symposium: New Zealand Annual Scientific Meeting*, 5.5. Retrieved from <http://www.otago.ac.nz/asceptnz/docs/programme.pdf>.

D'Mello, G., Drummond, B. K., Thomson, W. M., & Cullinan, M. P. (2011). Oral health of adolescents who had early childhood caries. *Journal of Dental Research*, 90(Spec Iss B), 154498. Retrieved from <http://www.dentalresearch.org.nz>.

Davidson, P., Wilson, S., Taylor, M., Waddell, N., Walsh, K., & Kieser, J. (2011). Tissue bubble momentum as a potential forensic parameter of gunshot backscatter. In S. Van Sint Jan, A. Carpentier, N. Guissard, A. Scafoglieri, V. Feipel, E. Cattrysse, ... & N. Warzée (Eds.), *Proceedings of the 23rd Congress of the International Society of Biomechanics (ISB)*, (pp. 128). ISB.

Dickson, G. C., Poulter, R.T.M., Kieser, J.A., Maas, E.W., & Probert, P.K. (2011). Profiling of marine microbial communities associated with decomposing remains can indicate postmortem submersion interval. *Proceedings of the American Academy of Forensic Sciences*, 17, (pp. 386-387). Denver, CO: AAFS. Retrieved from <http://www.aafs.org/sites/default/files/pdf/ProceedingsChicago2011.pdf>.

Farland, G., Kieser, J., & Farella, M. (2011). Under pressure: Are we the same? *New Zealand Dental Journal*, 107(4), (pp. 135).

Farland, G., Waddell, N., Sriharan, D., Farella, M., & Kieser, J. (2011). Is there a pattern to swallowing? *Dysphagia*, 26, (pp. 447). doi: 10.1007/s00455-011-9345-1

Friedlander, L.T., Coates, D. E., Cullinan, M. P., Seymour, G. J., Firth, N. A., & Rich, A. M. (2011). Vascular and angiogenic markers in the dentine-pulp complex of immature permanent teeth. *International Endodontic Journal*, 44(12), (pp. 1215). doi: 10.1111/j.1365-2591.2011.01914.x

Ho, H. G. D., Napper, R., & Kieser, J. (2011). Prenatal alcohol exposure's effects on mice's first molar structure. *Journal of Dental Research*, 90(Spec Iss B), 154573. Retrieved from <http://www.dentalresearch.org>.

Hussaini, H., Rich, A., Firth, N., & Seymour, G. (2011). T cell anergy and immune tolerance patterns in formalin-fixed paraffin-embedded oral squamous cell carcinoma and metastatic lymph nodes. *New Zealand Dental Journal*, 107, (pp. 131).

Hussaini, H. M., Saleh, A., Praveen, P., Milne, T., Zain, R., Firth, N., Rich, A., Seymour, G. (2011). T-cell anergy and tolerance patterns in oral squamous cell carcinoma. *Journal of Dental Research*, 90(Spec Iss B), 102. Retrieved from <http://www.dentalresearch.org>.

Leishman, S., Seymour, G., & Ford, P. (2011). Local and systemic responses to experimentally induced gingivitis. *Journal of Dental Research*, 90(Spec Iss B), 154906. Retrieved from <http://www.dentalresearch.org>.

Li, D. K. (2011). Negative pressure, cavitation effect and swallowing. *Journal of Dental Research*, 90(Spec Iss B), 154333. Retrieved from <http://www.dentalresearch.org>.

Mohd Sinon, S. H., Rich, A. M., Firth, N., & Seymour, G. J. (2011). Qualitative and quantitative immune cells assessment in oral lichen planus. *Journal of Dental Research*, 90(Spec Iss B), 191. Retrieved from <http://www.dentalresearch.org>.

Ng, D., McNee, C., Kieser, J., & Farella, M. (2011). Neck and shoulder muscle activity during work-related postural tasks. *Journal of Dental Research*, 90(Spec Iss B), 154105. Retrieved from <http://www.dentalresearch.org>.

Praveen, P. V., Rich, A. M., Horne, L., Hussaini, H. M., Heng, N. C. K., Coates, D. E., Milne, T. J., Seymour, G. J. (2011). Regulatory T-cells and Th17-cells infiltrate periodontal disease tissues. *Journal of Dental Research*, 90(Spec Iss A), 1429. Retrieved from <http://www.dentalresearch.org>.

Praveen, P., Seymour, G., Rich, A., Milne, T., Coates, D., Cullinan, M., & Heng, N. (2011). Tregs and IL17 + cells infiltrate periodontal disease tissues. *New Zealand Dental Journal*, 107, (pp. 133).

Rich, A. M., Ayers, K. M. S., Thomson, W. M., Sinclair, R. J., Seymour, G. J., & Rohan, M. J. (2011). Does performance in selection processes predict performance as a dental student? In K. Shephard, T. Harland, & A. Cohen (Eds.), *Proceedings of the Spotlight on Teaching and Learning Colloquium*, (pp. 56). Dunedin, New Zealand: HEDC, University of Otago.

Rodricks, R. I. B., Mackie, T. A., & Tompkins, G. R. (2011). *Porphyromonas gingivalis* and *Prevotella intermedia* responses to reactive oxygen species. *Journal of Dental Research*, 90(Spec Iss A), 2754. Retrieved from <http://www.dentalresearch.org>.

Seo, B. L., Rich, A. M., Coates, D., Leichter, J., Milne, T., & Seymour, G. J. (2011). Inflammation, Russell bodies, GRP78 and endoplasmic reticulum stress: Are they linked? *Pathology*, 43(Suppl. 1), (pp. S13). doi: 10.1097/01.PAT.0000394557.13378.f4

Smith, M., Duncan, W., Coates, D., Tawse-Smith, A., Leichter, J., & Rich, A. (2011). Two bovine xenografts compared in the sheep maxillary sinus model. *New Zealand Dental Journal*, 107, (pp. 133).

Sundaresan, D., Cullinan, M., Drummond, B., Seymour, G., Stanton, J., & Heng, N. (2011). Identification of friend and foe: Metagenomics of the oral cavity in health and disease. *New Zealand Medical Journal*, 124(1335). Retrieved from <http://www.nzma.org.nz/journal/124-1335/4693/content.pdf>.

Conference Contribution - Poster Presentation (not in published proceedings)

Bushby, S., Thomas, N., Priemel, P., Coulter, C., Rades, T., & Kieser, J. (2011, December). *Mad maggots: Forensic investigations of a psychotropic drug using a rat brain model*. Poster session presented at the Australasian Pharmaceutical Science Association (APSA) Annual Conference: Science Informing Practice: Practice Informing Science, Adelaide, Australia.

Milne, T. J., Coates, D., Cullinan, M. P., Heng, N. C. K., Leichter, J. W., & Seymour, G. J. (2011, June). *A multiplex qRT-PCR assay: A tool for determining periodontal treatment effectiveness*. Poster session presented at the Institute of Molecular Genetics of Academy of Science of the Czech Republic Symposium: Developments in Real-Time PCR from Preanalytics to Molecular Diagnostics, Prague, Czech Republic.

Smith, M., Duncan, W., Coates, D., Tawse-Smith, A., Leichter, J., & Rich, A. (2011, August). *Two bovine xenograft compared in the sheep maxillary sinus model*. Poster session presented at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.

Zafar, S., Coates, D., Seymour, G., Drummond, B., & Cullinan, M. (2011, August). *Effects of bisphosphonate on the mevalonate pathway in human gingival fibroblasts*. Poster session presented at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.

Conference Contribution - Verbal presentation and other Conference outputs

Benjamin, O., Silcock, P., Kieser, J., & Everett, D.W. (2011, November). *A model mouth design to study the release of volatile compounds during swallowing under the influence of tongue pressure*. Verbal presentation at the European Federation of Food Science & Technology (EFFoST) Annual Meeting: Process-Structure-Function Relationships, Berlin, Germany.

Kieser, J. (2011, October). *When the bough breaks: Child abuse and the forensic dentist*. Kenneth Brown Lecture at the Australian Society of Forensic Odontology Symposium, Darwin, Australia.

Kieser, J. (2011, October). *Skin and bones: The biomechanics of trauma*. Verbal presentation at the Australian Society of Forensic Odontology Symposium, Darwin, Australia.

Kieser, J. (2011, October). *Operation earthquake: The Christchurch experience*. Verbal presentation at the Australian Society of Forensic Odontology Symposium, Darwin, Australia.

Kim, R.W., Duncan, W.J., Coates, D., Milne, T., Cullinan, M., Tawse-Smith, A., & Leichter, J. (2011, April). *Wnt expression during early osseointegration of titanium dental implants*. Verbal presentation at the 15th Australian & New Zealand Academy of Periodontists (ANZAP) Scientific Meeting: Summits, Scaling & Success, Queenstown, New Zealand.

Loch, C., Schwass, D., Kieser, J.A., & Fordyce, R. E. (2011, November-December). *Use of micro-computed tomography for dental studies in modern and fossil odontocetes*. Verbal presentation at the 19th Biennial Conference on the Biology of Marine Mammals, Tampa, FL.

Parachuru, P., Rich, A. M., & Seymour, G. J. (2011, November). *IL-17 cells in periodontal disease: Are they T cells?* Verbal presentation at the Royal College of Pathologists of Australasia & New Zealand Society of Pathologists Annual Scientific Meeting, Auckland, New Zealand.

Praveen, P., Seymour, G., Rich, A., Milne, T., Coates, D., Cullinan, M., & Heng, N. (2011, August). *Tregs and IL17+ cells infiltrate periodontal disease tissues*. Verbal presentation at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.

Total publications: 58

ORAL DIAGNOSTIC & SURGICAL SCIENCES

Journal - Research Article

Abdelghany, A., Nolan, A., & Freeman, R. (2011). Treating patients with dry mouth: General dental practitioners' knowledge, attitudes and clinical management. *British Dental Journal*, 211, E21. doi: 10.1038/sj.bdj.2011.966

Alsabeeha, N. H. M., Payne, A. G. T., De Silva, R. K., & Thomson, W. M. (2011). Mandibular single-implant overdentures: Preliminary results of a randomised-control trial on early loading with different implant diameters and attachment systems. *Clinical Oral Implants Research*, 22(3), 330-337. doi: 10.1111/j.1600-0501.2010.02004.x

Anderson, V. R., Rich, A. M., & Seymour, G. J. (2011). Undergraduate dental education in New Zealand: 2007-2009 final-year student feedback on clinical learning environments. *New Zealand Dental Journal*, 107(3), 85-90.

Atieh, M., & Shahmiri, R. A. (2011). The evaluation of optimal taper of immediately loaded wide-diameter implants: A finite element analysis. *Journal of Oral Implantology*. Advance online publication. doi: 10.1563/AAID-JOI-D-11-00104

Becconsall-Ryan, K., & Love, R. M. (2011). Range and demographics of radiolucent jaw lesions in a new zealand population. *Journal of Medical Imaging & Radiation Oncology*, 55(1), 43-51. doi: 10.1111/j.1754-9485.2010.02228.x

Brown, S. D. K., & Payne, A. G. T. (2011). Immediately restored single implants in the aesthetic zone of the maxilla using a novel design: 1-year report. *Clinical Oral Implants Research*, 22(4), 445-454. doi: 10.1111/j.1600-0501.2010.02125.x

Bryant, S., McLaughlin, K., Morgaine, K., & Drummond, B. (2011). Elite athletes and oral health. *International Journal of Sports Medicine*, 32(9), 720-724. doi: 10.1055/s-0031-1277192

Campbell, D. I., De Silva, R. K., De Silva, H., Sinon, S. H., & Rich, A. M. (2011). Temporomandibular joint synovial chondromatosis with intracranial extension: A review and observations of patient observed for 4 years. *Journal of Oral & Maxillofacial Surgery*, 69(8), 2247-2252. doi: 10.1016/j.joms.2010.10.042

- Desai, S.V., Love, R. M., Rich, A. M., & Seymour, G. J. (2011). Antigen recognition and presentation in periapical tissues: A role for TLR expressing cells? *International Endodontic Journal*, 44(2), 87-99. doi: 10.1111/j.1365-2591.2010.01817.x
- Desai, S.V., Love, R. M., Rich, A. M., & Seymour, G. J. (2011). Toll-like receptor 2 expression in refractory periapical lesions. *International Endodontic Journal*, 44(10), 907-916. doi: 10.1111/j.1365-2591.2011.01893.x
- Dias, D. K., De Silva, H. L., & Senadeera, W. M. (2011). Mid-maxillary distraction osteogenesis of cleft patients using a special custom-made tooth-borne device. *Ceylon Medical Journal*, 56(3), 108-111.
- Hussaini, H. M., Waddell, J. N., Girvan, L., West, L. M., Kardos, T. B., Rich, A. M., & Seymour, G. J. (2011). Silver solder "tattoo": A novel form of oral pigmentation identified with the use of field emission scanning electron microscopy and electron dispersive spectrography. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, & Endodontology*, 112(4), e6-e10. doi: 10.1016/j.tripleo.2011.03.049
- Jattan, R., De Silva, H. L., De Silva, R. K., Rich, A. M., & Love, R. M. (2011). A case series of odontogenic keratocysts from a New Zealand population over a 20-year period. *New Zealand Dental Journal*, 107(4), 112-116.
- Kieser, J., Bolter, C., Raniga, N., Waddell, J. N., Swain, M., & Farland, G. (2011). Tongue-palate interactions during swallowing. *Journal of Texture Studies*, 42(2), 95-102. doi: 10.1111/j.1745-4603.2010.00274.x
- McCane, B., & Kean, M. R. (2011). Integration of parts in the facial skeleton and cervical vertebrae. *American Journal of Orthodontics & Dentofacial Orthopedics*, 139(1), e13-e30. doi: 10.1016/j.ajodo.2010.06.016
- McGettigan, A., Timmins, K., Herbison, P., Liversidge, H., & Kieser, J. (2011). Wisdom tooth formation as a method of estimating age in a New Zealand population. *Dental Anthropology*, 24(2-3), 33-41.
- Ng, L. K., Rich, A. M., Hussaini, H. M., Thomson, W. M., Fisher, A. L., Horne, L. S., & Seymour, G. J. (2011). Toll-like receptor 2 is present in the microenvironment of oral squamous cell carcinoma. *British Journal of Cancer*, 104(3), 460-463. doi: 10.1038/sj.bjc.6606057
- Parton, A. L., Tong, D. C., De Silva, H. L., Farella, M., & De Silva, R. K. (2011). A nine-year review of orthognathic surgery at the University of Otago. *New Zealand Dental Journal*, 107(4), 117-120.
- Patel, K. J., De Silva, H. L., Tong, D. C., & Love, R. M. (2011). Concordance between clinical and histopathologic diagnoses of oral mucosal lesions. *Journal of Oral & Maxillofacial Surgery*, 69(1), 125-133. doi: 10.1016/j.joms.2010.07.075
- Siddiqi, A., Payne, A. G. T., De Silva, R. K., & Duncan, W. J. (2011). Titanium allergy: Could it affect dental implant integration? *Clinical Oral Implants Research*, 22(7), 673-680. doi: 10.1111/j.1600-0501.2010.02081.x
- Sinon, S. H., Rich, A. M., Hussaini, H. M., Yoon, H.-S., Firth, N. A., & Seymour, G. J. (2011). Metastases to the oral region from pleural mesothelioma: Clinicopathologic review. *Head & Neck*. Advance online publication. doi: 10.1002/hed.21942
- Tong, D. C., Brooking, T. H., & Love, R. (2011). The management of maxillofacial trauma during the Korean War: A coming of age of a specialty. *Journal of Military & Veterans' Health*, 19(2), 10-14.
- Tong, D. C., & Trottier, V. J. (2011). Interdisciplinary approach to the management of an 18-month-old burn victim in Afghanistan. *Military Medicine*, 176(1), 115-118.
- Verma, P., & Love, R. M. (2011). A Micro CT study of the mesiobuccal root canal morphology of the maxillary first molar tooth. *International Endodontic Journal*, 44(3), 210-217. doi: 10.1111/j.1365-2591.2010.01800.x

Journal - Research Other

- Friedlander, L., Chandler, N., & Love, R. (2011). Periapical healing following combined non-surgical and surgical retreatments [Case report]. *ENDO*, 5(1), 27-34.
- Ting, S. R. Y. J., Quick, A. N., & Winters, J. C. (2011). The impacted maxillary canine: Revisiting the clinical guideline, with case illustrations. *New Zealand Dental Journal*, 107(1), 19-23.

Conference Contribution - Published proceedings: Abstract

De Silva, R. (2011). Synovial chondromatosis of the temporomandibular joint with intracranial extension: Report of a case. *International Journal of Oral & Maxillofacial Surgery*, 40(10), (pp. 1102). doi: 10.1016/j.ijom.2011.07.256

De Silva, H. L., & De Silva, R. K. (2011). An unusually large osteochondroma of the mandibular condyle: Diagnostic confusion with temporomandibular dysfunction. *International Journal of Oral & Maxillofacial Surgery*, 40(10), (pp. 1101). doi: 10.1016/j.ijom.2011.07.254

Farland, G., Kieser, J., & Farella, M. (2011). Under pressure: Are we the same? *New Zealand Dental Journal*, 107(4), (pp. 135).

Friedlander, L. T., Coates, D. E., Cullinan, M. P., Seymour, G. J., Firth, N. A., & Rich, A. M. (2011). Vascular and angiogenic markers in the dentine-pulp complex of immature permanent teeth. *International Endodontic Journal*, 44(12), (pp. 1215). doi: 10.1111/j.1365-2591.2011.01914.x

Hussaini, H., Rich, A., Firth, N., & Seymour, G. (2011). T cell anergy and immune tolerance patterns in formalin-fixed paraffin-embedded oral squamous cell carcinoma and metastatic lymph nodes. *New Zealand Dental Journal*, 107, (pp. 131).

Hussaini, H. M., Saleh, A., Praveen, P., Milne, T., Zain, R., Firth, N., Rich, A., Seymour, G. (2011). T-cell anergy and tolerance patterns in oral squamous cell carcinoma. *Journal of Dental Research*, 90(Spec Iss B), 102. Retrieved from <http://www.dentalresearch.org>.

Leavai, F. P. J. (2011). Management of maxillofacial injuries and fractures in Samoa. In C. Matthewson, M. Taumoepeau, G. Burnett, & I. Iati (Eds.), *Proceedings of the Pacific Postgraduate Symposium: Pacific Voices VIII*, (pp. 39). Dunedin, New Zealand: Pacific Islands Centre, University of Otago.

Mohd Sinon, S. H., Rich, A. M., Firth, N., & Seymour, G. J. (2011). Qualitative and quantitative immune cells assessment in oral lichen planus. *Journal of Dental Research*, 90(Spec Iss B), 191. Retrieved from <http://www.dentalresearch.org>.

Ng, D., McNee, C., Kieser, J., & Farella, M. (2011). Neck and shoulder muscle activity during work-related postural tasks. *Journal of Dental Research*, 90(Spec Iss B), 154105. Retrieved from <http://www.dentalresearch.org>.

Praveen, P. V., Rich, A. M., Horne, L., Hussaini, H. M., Heng, N. C. K., Coates, D. E., Milne, T. J., Seymour, G. J. (2011). Regulatory T-cells and Th17-cells infiltrate periodontal disease tissues. *Journal of Dental Research*, 90(Spec Iss A), 1429. Retrieved from <http://www.dentalresearch.org>.

Praveen, P., Seymour, G., Rich, A., Milne, T., Coates, D., Cullinan, M., & Heng, N. (2011). Tregs and IL17 + cells infiltrate periodontal disease tissues. *New Zealand Dental Journal*, 107, (pp. 133).

Rich, A. M., Ayers, K. M. S., Thomson, W. M., Sinclair, R. J., Seymour, G. J., & Rohan, M. J. (2011). Does performance in selection processes predict performance as a dental student? In K. Shephard, T. Harland, & A. Cohen (Eds.), *Proceedings of the Spotlight on Teaching and Learning Colloquium*, (pp. 56). Dunedin, New Zealand: HEDC, University of Otago.

Seo, B. L., Rich, A. M., Coates, D., Leichter, J., Milne, T., & Seymour, G. J. (2011). Inflammation, Russell bodies, GRP78 and endoplasmic reticulum stress: Are they linked? *Pathology*, 43(Suppl. 1), (pp. S13). doi: 10.1097/01.PAT.0000394557.13378.f4

Smith, M., Duncan, W., Coates, D., Tawse-Smith, A., Leichter, J., & Rich, A. (2011). Two bovine xenografts compared in the sheep maxillary sinus model. *New Zealand Dental Journal*, 107, (pp. 133).

Conference Contribution - Poster Presentation (not in published proceedings)

Atieh, M., Alsabeeha, N., Duncan, W., Cullinan, M., de Silva, R., Schwass, D., & Payne, A. (2011, November). *Can resonance frequency analysis predict implant failure?* Poster session presented at the 8th Biennial Conference of the Australasian Osseointegration Society (AOS), Adelaide, Australia.

Smith, M., Duncan, W., Coates, D., Tawse-Smith, A., Leichter, J., & Rich, A. (2011, August). *Two bovine xenograft compared in the sheep maxillary sinus model.* Poster session presented at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.

Conference Contribution - Verbal presentation and other Conference outputs

Broughton, J. R. (2011, August). *Dental student placements with indigenous dental clinics in New Zealand*. Verbal presentation at the Hui Poutama: Māori Research Symposium: Past Present Future: Ka Haere Whakamua, Ka Titiro Whakamuri, Dunedin, New Zealand.

De Silva, H. L. (2011, March). *Orbito-zygomatic complex fractures*. College lecture at the 24th Annual Academic Sessions of the College of Dentistry and Stomatology of Sri Lanka, Battaramulla, Sri Lanka.

Paracharu, P., Rich, A. M., & Seymour, G. J. (2011, November). *IL-17 cells in periodontal disease: Are they T cells?* Verbal presentation at the Royal College of Pathologists of Australasia & New Zealand Society of Pathologists Annual Scientific Meeting, Auckland, New Zealand.

Praveen, P., Seymour, G., Rich, A., Milne, T., Coates, D., Cullinan, M., & Heng, N. (2011, August). *Tregs and IL17+ cells infiltrate periodontal disease tissues*. Verbal presentation at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.

Rich, A. (2011, November). *What specimens are referred from general pathologists to oral pathologists for review?* Verbal presentation at the Royal College of Pathologists of Australasia & New Zealand Society of Pathologists Annual Scientific Meeting, Auckland, New Zealand.

Total publications: 47

ORAL REHABILITATION

Chapter in Book - Research

Beumer III, J., Sung, E. C., Kagan, R., Lyons, K. M., Gulbransen, H. J., Venkatachalam, B., & Ghaem-Maghami, N. (2011). Oral management of patients treated with radiation therapy and/or chemoradiation. In J. Beumer III, M.T. Marunick, & S. J. Esposito (Eds.), *Maxillofacial rehabilitation: Prosthodontic and surgical management of cancer-related, acquired, and congenital defects of the head and neck* (3rd ed.) (pp. 1-59). Chicago: Quintessence Books.

Journal - Research Article

Abduo, J., Bennani, V., Lyons, K., Waddell, N., & Swain, M. (2011). A novel *in vitro* approach to assess the fit of implant frameworks. *Clinical Oral Implants Research*, 22(6), 658-663. doi: 10.1111/j.1600-0501.2010.02019.x

Abduo, J., Lyons, K., Bennani, V., Waddell, N., & Swain, M. (2011). Fit of screw-retained fixed implant frameworks fabricated by different methods: A systematic review. *International Journal of Prosthodontics*, 24(3), 207-220.

Abduo, J., & Swain, M. (2011). Self-reparability of glass-ionomer cements: An *in vitro* investigation. *European Journal of Oral Sciences*, 119(2), 187-191. doi: 10.1111/j.1600-0722.2011.00810.x

Allsobrook, O. F. L., Leichter, J., Holborow, D., & Swain, M. (2011). Descriptive study of the longevity of dental implant surgery drills. *Clinical Implant Dentistry & Related Research*, 13(3), 244-254. doi: 10.1111/j.1708-8208.2009.00205.x

Alsabeeha, N. H. M., Payne, A. G. T., De Silva, R. K., & Thomson, W. M. (2011). Mandibular single-implant overdentures: Preliminary results of a randomised-control trial on early loading with different implant diameters and attachment systems. *Clinical Oral Implants Research*, 22(3), 330-337. doi: 10.1111/j.1600-0501.2010.02004.x

Alsabeeha, N. H. M., Swain, M. V., & Payne, A. G. T. (2011). Clinical performance and material properties of single-implant overdenture attachment systems. *International Journal of Prosthodontics*, 24(3), 247-254.

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Areai, D. M., Thomson, W. M., Foster Page, L. A., Denny, S. J., Crengle, S., Clark, T. C., Koopu, P. I. (2011). Self-reported oral health, dental self-care and dental service use among New Zealand secondary school students: Findings from the Youth 07 study. *New Zealand Dental Journal*, 107(4), 121-126.

Atieh, M., & Shahmiri, R. A. (2011). The evaluation of optimal taper of immediately loaded wide-diameter implants: A finite element analysis. *Journal of Oral Implantology*. Advance online publication. doi: 10.1563/AAID-JOI-D-11-00104

Bai, Y., Park, I. S., Lee, S. J., Bae, T. S., Duncan, W., Swain, M., & Lee, M. H. (2011). One-step approach for hydroxyapatite-incorporated TiO₂ coating on titanium via a combined technique of micro-arc oxidation and electrophoretic deposition. *Applied Surface Science*, 257(15), 7010-7018. doi: 10.1016/j.apsusc.2011.03.058

Bai, Y., Park, I. S., Park, H. H., Lee, M. H., Bae, T. S., Duncan, W., & Swain, M. (2011). The effect of annealing temperatures on surface properties, hydroxyapatite growth and cell behaviors of TiO₂ nanotubes. *Surface & Interface Analysis*, 43(6), 998-1005. doi: 10.1002/sia.3683

Benic, G. Z., Tawse-Smith, A., & Bennani, V. (2011). Clinical implications of nanosurface technology on clinical success and survival rate of single implant restorations: A review. *Revista Periodontia*, 21(1), 55-64.

Broadbent, J. M., Thomson, W. M., Boyens, J. V., & Poulton, R. (2011). Dental plaque and oral health during the first 32 years of life. *Journal of the American Dental Association*, 142(4), 415-

Brown, S. D. K., & Payne, A. G. T. (2011). Immediately restored single implants in the aesthetic zone of the maxilla using a novel design: 1-year report. *Clinical Oral Implants Research*, 22(4), 445-454. doi: 10.1111/j.1600-0501.2010.02125.x

Chang, Y.-S. M., Bennani, V., Tawse-Smith, A., & Girvan, L. (2011). Effect of a cordless retraction paste material on implant surfaces: An *in vitro* study. *Brazilian Oral Research*, 25(6), 492-499. doi: 10.1590/S1806-83242011000600004

Chang, C. W., Waddell, J. N., Lyons, K. M., & Swain, M. V. (2011). Cracking of porcelain surfaces arising from abrasive grinding with a dental air turbine. *Journal of Prosthodontics*, 20(8), 613-620. doi: 10.1111/j.1532-849X.2011.00760.x

Choi, J. E., Waddell, J. N., & Swain, M. V. (2011). Pressed ceramics onto zirconia: Part 2: Indentation fracture and influence of cooling rate on residual stresses. *Dental Materials*, 27(11), 1111-1118. doi: 10.1016/j.dental.2011.08.003

Choi, J. H., Waddell, J. N., Torr, B., & Swain, M. V. (2011). Pressed ceramics onto zirconia. Part 1: Comparison of crystalline phases present, adhesion to a zirconia system and flexural strength. *Dental Materials*, 27(12), 1204-1212. doi: 10.1126/science.1159584

Desai, S. V., Love, R. M., Rich, A. M., & Seymour, G. J. (2011). Antigen recognition and presentation in periapical tissues: A role for TLR expressing cells? *International Endodontic Journal*, 44(2), 87-99. doi: 10.1111/j.1365-2591.2010.01817.x

Desai, S. V., Love, R. M., Rich, A. M., & Seymour, G. J. (2011). Toll-like receptor 2 expression in refractory periapical lesions. *International Endodontic Journal*, 44(10), 907-916. doi: 10.1111/j.1365-2591.2011.01893.x

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Foster Page, L. A., Thomson, W. M., & Quick, A. N. (2011). Changes in malocclusion over time in New Zealand adolescents. *Australian Orthodontic Journal*, 27(2), 169-175.

Friedlander, L., & Anderson, V. (2011). A new predoctoral endodontic module: Evaluating learning and effectiveness. *Journal of Dental Education*, 75(3), 351-359.

He, L.-H., Purton, D., & Swain, M. (2011). A novel polymer infiltrated ceramic for dental simulation. *Journal of Materials Science: Materials in Medicine*, 22(7), 1639-1643. doi: 10.1007/s10856-011-4350-3

He, L.-H., & Swain, M. (2011). A novel polymer infiltrated ceramic dental material. *Dental Materials*, 27(6), 527-534. doi: 10.1016/j.dental.2011.02.002

He, L.-H., Xu, Y., & Purton, D. G. (2011). *In vitro* demineralisation of the cervical region of human teeth. *Archives of Oral Biology*, 56(5), 512-519. doi: 10.1016/j.archoralbio.2010.11.009

Hussaini, H. M., Waddell, J. N., Girvan, L., West, L. M., Kardos, T. B., Rich, A. M., & Seymour, G. J. (2011). Silver solder "tattoo": A novel form of oral pigmentation identified with the use of field emission scanning electron microscopy and electron dispersive spectrography. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, & Endodontology*, 112(4), e6-e10. doi: 10.1016/j.tripleo.2011.03.049

Kieser, J., Bolter, C., Raniga, N., Waddell, J. N., Swain, M., & Farland, G. (2011). Tongue-palate interactions during swallowing. *Journal of Texture Studies*, 42(2), 95-102. doi: 10.1111/j.1745-4603.2010.00274.x

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Kieser, J. A., Tahere, J., Agnew, C., Kieser, D. C., Duncan, W., Swain, M. V., & Reeves, M. T. (2011). Morphoscopic analysis of experimentally produced bony wounds from low-velocity ballistic impact. *Forensic Science, Medicine, & Pathology*, 7(4), 322-332. doi: 10.1007/s12024-011-9240-y

Mackie, A., Lyons, K., Thomson, W. M., & Payne, A. G. T. (2011). Mandibular two-implant overdentures: Three-year prosthodontic maintenance using the locator attachment system. *International Journal of Prosthodontics*, 24(4), 328-331.

Mackie, A., Lyons, K., Thomson, W. M., & Payne, A. G. T. (2011). Mandibular two-implant overdentures: Prosthodontic maintenance using different loading protocols and attachment systems. *International Journal of Prosthodontics*, 24(5), 405-416.

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Quick, A. N., Lim, Y., Loke, C., Juan, J., Swain, M., & Herbison, P. (2011). Moments generated by simple V-bends in nickel titanium wires. *European Journal of Orthodontics*, 33(4), 457-460. doi: 10.1093/ejo/cjq103

Siddiqi, A., Payne, A. G. T., De Silva, R. K., & Duncan, W. J. (2011). Titanium allergy: Could it affect dental implant integration? *Clinical Oral Implants Research*, 22(7), 673-680. doi: 10.1111/j.1600-0501.2010.02081.x

Zanicotti, D. G., Matsubara, F. B., Zielak, J. C., Giovanini, A. F., de Andrade Urban, C., & Deliberador, T. M. (2011). Non-processed adipose tissue graft in the treatment of peri-implant osseous defects in the rabbit's tibiae: A pilot study. *Journal of Oral Implantology*. Advance online publication. doi: 10.1563/aaid-joi-d-11-00149

Journal - Research Other

Friedlander, L., Chandler, N., & Love, R. (2011). Periapical healing following combined non-surgical and surgical retreatments [Case report]. *ENDO*, 5(1), 27-34.

Peché, W.-A., Jansen van Vuuren, L., & Park, C. (2011). Full-arched milled titanium implant bridge: Technical report. *New Zealand Dental Journal*, 107(3), 101-103.

Conference Contribution - Published proceedings: Abstract

Abduo, J., Swain, M., Bennani, V., Lyons, K., & Waddell, N. (2011). Fit of implant zirconia fixed partial dentures. *New Zealand Dental Journal*, 107(1), (pp. 29-30).

Alothmani, O. S., Chandler, N. P., Friedlander, L. T., & Monteith, B. D. (2011). Influence of clinical experience on the accuracy and consistency of estimating radiographic working length adjustment. *International Endodontic Journal*, 44(12), (pp. 1182-1183). doi: 10.1111/j.1365-2591.2011.01914.x

Baillie, L. J. M., Blyth, P., Schwass, D., Torr, B., Perumal, V., & Dias, G. J. (2011). Comparison of two measurement methods: Slide calliper and cone beam computed tomography, using facial soft tissue depth probes. *Proceedings of the 8th Annual Conference of the Australian and New Zealand Association of Clinical Anatomists (ANZACA): New Insights: Implications for Clinical Practice*, (pp. 20). Retrieved from http://anzaca.otago.ac.nz/images/anzaca2011/anzaca2011_abstracts.pdf.

Batra, A., Drummond, B., Swain, M., & Kieser, J. (2011). Effect of sodium hypochlorite and CPP-ACP on hypomineralised enamel in molar incisor hypomineralisation (MIH). *New Zealand Dental Journal*, 107(4), (pp. 136).

Batra, A., Drummond, B., Swain, M., & Kieser, J. (2011). Effect of NaOCl and ToothMousse™ on hypomineralised enamel in MIH. *Journal of Dental Research*, 90(Spec Iss B), 154488. Retrieved from <http://www.dentalresearch.org>.

Chandler, N. P., Mundy, L., Purton, D. G., & Tompkins, G. R. (2011). Antibacterial effect of root canal lubricants. *International Endodontic Journal*, 44(12), (pp. 1185-1186). doi: 10.1111/j.1365-2591.2011.01914.x

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Foster Page, L. (2011). The performance of the CPQ11-14 in different caries prevalent populations in New Zealand. *Proceedings of the British Society for Oral and Dental Research (BSODR) Conference*. Retrieved from <http://bsodr2011.group.shef.ac.uk/cms/>.

Friedlander, L. T., Coates, D. E., Cullinan, M. P., Seymour, G. J., Firth, N. A., & Rich, A. M. (2011). Vascular and angiogenic markers in the dentine-pulp complex of immature permanent teeth. *International Endodontic Journal*, 44(12), (pp. 1215). doi: 10.1111/j.1365-2591.2011.01914.x

Hauman, C. H. J., Russell, A., Chandler, N. P., Siddiqui, A., & Tompkins, G. R. (2011). Effect of age on the density of dentinal tubules at three levels of tooth roots. *International Endodontic Journal*, 44(12), (pp. 1179). doi: 10.1111/j.1365-2591.2011.01914.x

He, L. H., Foster Page, L., & Purton, D. (2011). An evaluation of dental operative simulation materials. *Journal of Dental Research*, 90(Spec Iss B), 154356. Retrieved from <http://www.dentalresearch.org>.

Kemphorne, J., Kieser, D., Walker, C., Chin, M., & Swain, M. (2011). Minimising the risk of future peri-prosthetic femoral shaft fracture: A biomechanical study. *Proceedings of the New Zealand Orthopaedic Association (NZOA) and Australian Orthopaedic Association (AOA) Combined Annual Scientific Meeting: Orthopaedic Education: The E-future*. Retrieved from <http://www.aozoa2011.co.nz/>.

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Praveen, P., Seymour, G., Rich, A., Milne, T., Coates, D., Cullinan, M., & Heng, N. (2011). Tregs and IL17 + cells infiltrate periodontal disease tissues. *New Zealand Dental Journal*, 107, (pp. 133).

Russell, A., Chandler, N. P., Hauman, C. H. J., Siddiqui, A., & Tompkins, G. R. (2011). The 'butterfly' optical effect: A SEM investigation. *International Endodontic Journal*, 44(12), (pp. 1179). doi: 10.1111/j.1365-2591.2011.01914.x

Siddiqui, A. Y., Hauman, C. H. J., Chandler, N. P., & Tompkins, G. R. (2011). Influence of patient age on bacterial invasion, distribution, and viability in root dentine. *International Endodontic Journal*, 44(12), (pp. 1185). doi: 10.1111/j.1365-2591.2011.01914.x

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Conference Contribution - Poster Presentation (not in published proceedings)

Al-Amleh, B., Waddell, N., Lyons, K., Jansen van Vuuren, L., He, C., & Swain, M.V. (2011, September). *Influence of veneering porcelain thickness and cooling rate on residual tensile stresses in zirconia crowns*. Poster session presented at the 14th Meeting of the International College of Prosthodontists (ICP), Big Island, Hawaii.

Atieh, M., Alsabeeha, N., Duncan, W., Cullinan, M., de Silva, R., Schwass, D., & Payne, A. (2011, November). *Can resonance frequency analysis predict implant failure?* Poster session presented at the 8th Biennial Conference of the Australasian Osseointegration Society (AOS), Adelaide, Australia.

Chang, C.W., Schwass, D.R., Waddell, J. N., & Swain, M.V. (2011, September). *Flexural strength consequences of simulated clinical adjustment on lithium metasilicate prior to crystallisation into lithium disilicate*. Poster session presented at the 14th Meeting of the International College of Prosthodontists (ICP), Big Island, Hawaii.

He, L. (2011, April). *Characterization of a novel polymer infiltrated dental ceramic*. Poster session presented at the 21st Annual Australasian Society for Biomaterials and Tissue Engineering (ASBTE) Conference, Queenstown, New Zealand.

Law, C.Y.C., Bennani, V., Waddell, J. N., Lyons, K., Torr, B., & Swain, M.V. (2011, September). *The effect of a partially dentate mandible restored with fixed implant prosthesis on resultant mandibular strain deformation: A preliminary study*. Poster session presented at the 14th Meeting of the International College of Prosthodontists (ICP), Big Island, Hawaii.

Ma, S., & Alsabeeha, N. H. (2011, September). *Intention to treat: Conversion of a mandibular implant-assisted partial denture to a mandibular 3-implant overdenture*. Poster session presented at the 14th Meeting of the International College of Prosthodontists (ICP), Big Island, Hawaii.

Osman, R. B., Elkhadem, A. H., Ma, S., & Swain, M.V. (2011, September). *A finite element analysis of a novel implant distribution supporting maxillary overdentures*. Poster session presented at the 14th Meeting of the International College of Prosthodontists (ICP), Big Island, Hawaii.

Smith, M., Duncan, W., Coates, D., Tawse-Smith, A., Leichter, J., & Rich, A. (2011, August). *Two bovine xenograft compared in the sheep maxillary sinus model*. Poster session presented at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.

Conference Contribution - Verbal presentation and other Conference outputs

Jansen van Vuuren, L., & He, L. H. (2011, April). *A novel strengthening method of porous material*. Verbal presentation at the 21st Annual Australasian Society for Biomaterials and Tissue Engineering (ASBTE) Conference, Queenstown, New Zealand.

Loch, C., Schwass, D., Kieser, J. A., & Fordyce, R. E. (2011, November-December). *Use of micro-computed tomography for dental studies in modern and fossil odontocetes*. Verbal presentation at the 19th Biennial Conference on the Biology of Marine Mammals, Tampa, FL.

Smith, M., Coates, D., & Duncan, W. (2011, April). *Two bovine xenograft compared in the sheep maxillary sinus model*. Verbal presentation at the 15th Australian & New Zealand Academy of Periodontists (ANZAP) Scientific Meeting: Summits, Scaling & Success, Queenstown, New Zealand.

Total publications: 73

ORAL SCIENCES

Chapter in Book - Research

Thomson, W. M., Ikebe, K., Tordoff, J. M., & Campbell, A. J. (2011). Dry mouth and medications. In M. I. MacEntee (Ed.), *Oral healthcare and the frail elderly: A clinical perspective* (pp. 51-72). Ames, IA: Blackwell.

Tompkins, G. R. (2011). Genotypic comparison of bacterial DNA recovered from bitemarks and teeth. In R. B. J. Dorion (Ed.), *Bitemark evidence: A color atlas and text* (2nd ed.). Boca Raton, FL: CRC Press.

Wade, K. J., & Meldrum, A. M. (2011). Gingivitis control. In F. S. Panagakos & R. M. Davies (Eds.), *Gingival diseases: Their aetiology, prevention and treatment* (pp. 139-154). Rijeka, Croatia: InTech.

Journal - Research Article

- Aldawood, S., Ampuan, S. N. H., Medara, N., & Thomson, W. M. (2011). Orthodontic treatment provision and referral preferences among New Zealand general dental practitioners. *Australian Orthodontic Journal*, 27(2), 145-154.
- Allsobrook, O. F. L., Leichter, J., Holborow, D., & Swain, M. (2011). Descriptive study of the longevity of dental implant surgery drills. *Clinical Implant Dentistry & Related Research*, 13(3), 244-254. doi: 10.1111/j.1708-8208.2009.00205.x
- Alsabeeha, N. H. M., Payne, A. G. T., De Silva, R. K., & Thomson, W. M. (2011). Mandibular single-implant overdentures: Preliminary results of a randomised-control trial on early loading with different implant diameters and attachment systems. *Clinical Oral Implants Research*, 22(3), 330-337. doi: 10.1111/j.1600-0501.2010.02004.x
- Anning, R. J., Thomson, W. M., & Quick, A. N. (2011). Orthodontic education programs: An international comparison of students' views and experiences. *American Journal of Orthodontics & Dentofacial Orthopedics*, 139(2), 220-227. doi: 10.1016/j.ajodo.2010.01.032
- Areai, D. M., Thomson, W. M., Foster Page, L. A., Denny, S. J., Crengle, S., Clark, T. C., Koopu, P. I. (2011). Self-reported oral health, dental self-care and dental service use among New Zealand secondary school students: Findings from the Youth 07 study. *New Zealand Dental Journal*, 107(4), 121-126.
- Bai, Y., Park, I. S., Lee, S. J., Bae, T. S., Duncan, W., Swain, M., & Lee, M. H. (2011). One-step approach for hydroxyapatite-incorporated TiO₂ coating on titanium via a combined technique of micro-arc oxidation and electrophoretic deposition. *Applied Surface Science*, 257(15), 7010-7018. doi: 10.1016/j.apsusc.2011.03.058
- Bai, Y., Park, I. S., Park, H. H., Lee, M. H., Bae, T. S., Duncan, W., & Swain, M. (2011). The effect of annealing temperatures on surface properties, hydroxyapatite growth and cell behaviors of TiO₂ nanotubes. *Surface & Interface Analysis*, 43(6), 998-1005. doi: 10.1002/sia.3683
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- Chan, Y. M., Williams, S., Davidson, L. E., & Drummond, B. K. (2011). Orofacial and dental trauma of young children in Dunedin, New Zealand. *Dental Traumatology*, 27(3), 199-202. doi: 10.1111/j.1600-9657.2011.00989.x
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- D'Mello, G., Chia, L., Hamilton, S. D., Thomson, W. M., & Drummond, B. K. (2011). Childhood obesity and dental caries among paediatric dental clinic attenders. *International Journal of Paediatric Dentistry*, 21(3), 217-222. doi: 10.1111/j.1365-263X.2011.01112.x
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Conference Contribution - Published proceedings: Abstract

Batra, A., Drummond, B., Swain, M., & Kieser, J. (2011). Effect of sodium hypochlorite and CPP-ACP on hypomineralised enamel in molar incisor hypomineralisation (MIH). *New Zealand Dental Journal*, 107(4), (pp. 136).

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Conference Contribution - Poster Presentation (not in published proceedings)

Atieh, M., Alsabeeha, N., Duncan, W., Cullinan, M., de Silva, R., Schwass, D., & Payne, A. (2011, November). *Can resonance frequency analysis predict implant failure?* Poster session presented at the 8th Biennial Conference of the Australasian Osseointegration Society (AOS), Adelaide, Australia.

Milne, T. J., Coates, D., Cullinan, M. P., Heng, N. C. K., Leichter, J. W., & Seymour, G. J. (2011, June). *A multiplex qRT-PCR assay: A tool for determining periodontal treatment effectiveness.* Poster session presented at the Institute of Molecular Genetics of Academy of Science of the Czech Republic Symposium: Developments in Real-Time PCR from Preanalytics to Molecular Diagnostics, Prague, Czech Republic.

Osman, R. B., Elkhadem, A. H., Ma, S., & Swain, M. V. (2011, September). *A finite element analysis of a novel implant distribution supporting maxillary overdentures.* Poster session presented at the 14th Meeting of the International College of Prosthodontists (ICP), Big Island, Hawaii.

Smith, M., Duncan, W., Coates, D., Tawse-Smith, A., Leichter, J., & Rich, A. (2011, August). *Two bovine xenograft compared in the sheep maxillary sinus model.* Poster session presented at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.

Wolfer, M., Mashburn-Warren, L., Federle, M., Heng, N., & Morrison, D. (2011, September). *Control of the competence regulon in pyogenic streptococci: Type II ComR receptors recognize species-specific peptide pheromones when expressed in a heterologous host.* Poster session presented at the XVIII Lancefield International Symposium, Palermo, Italy.

Zafar, S., Coates, D., Seymour, G., Drummond, B., & Cullinan, M. (2011, August). *Effects of bisphosphonate on the mevalonate pathway in human gingival fibroblasts.* Poster session presented at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.

Conference Contribution - Verbal presentation and other Conference outputs

Aitken, M., & Gaffney, M. (2011, November). *School was pretty good and why not? A student with learning difficulties shares some classroom experiences.* Verbal presentation at the Disability Studies Inaugural Conference: Every Body In, Dunedin, New Zealand.

Cannon, R. D., Ivnitski-Steele, I., Monk, B. C., Sklar, L. A., & Holmes, A. R. (2011, November). *Overcoming drug resistance in oral yeast.* Keynote address at the New Zealand Microbiological Society Conference, Palmerston North, New Zealand.

Heng, N., Haji-Ishak, N., Kalyan, A., Wong, A., Lovric, M., Bridson, J., Artamonova, J., Stanton, J.-A., Wescombe, P., Burton, J., Cullinan, M., Tagg, J. (2011, November). *The genome sequence of the oral probiotic Streptococcus salivarius strain M18.* Verbal presentation at the New Zealand Microbiological Society (NZMS) Conference: Right here, right now!, Palmerston North, New Zealand.

Kim, R. W., Duncan, W. J., Coates, D., Milne, T., Cullinan, M., Tawse-Smith, A., & Leichter, J. (2011, April). *Wnt expression during early osseointegration of titanium dental implants.* Verbal presentation at the 15th Australian & New Zealand Academy of Periodontists (ANZAP) Scientific Meeting: Summits, Scaling & Success, Queenstown, New Zealand.

Morgaine, K. (2011, August). *Health promotion ethics.* Verbal presentation at the New Zealand College of Public Health Medicine Annual Scientific Meeting and Workshop, Wellington, New Zealand.

Praveen, P., Seymour, G., Rich, A., Milne, T., Coates, D., Cullinan, M., & Heng, N. (2011, August). *Tregs and IL17+ cells infiltrate periodontal disease tissues.* Verbal presentation at the Faculty of Dentistry 3M Research Day, Dunedin, New Zealand.

Schmid, J., Wilkins, M., Zhang, N., Cox, M., Cannon, R., & Schardl, C. (2011, November). *Biological function of DNA repeats in fungal open reading frames.* Verbal presentation at the New Zealand Microbiological Society Conference, Palmerston North, New Zealand.

Smith, M., Coates, D., & Duncan, W. (2011, April). *Two bovine xenograft compared in the sheep maxillary sinus model.* Verbal presentation at the 15th Australian & New Zealand Academy of Periodontists (ANZAP) Scientific Meeting: Summits, Scaling & Success, Queenstown, New Zealand.

Theodore, R., Broadbent, J., & Poulton, R. (2011, November). *Early life determinants of systolic blood pressure trajectories from 7 to 32 years of age*. Verbal presentation at the Paediatric Society of New Zealand 63rd Annual Scientific Meeting, Auckland, New Zealand.

Zhang, N., Magee, B. B., Magee, P.T., Holland, B. R., Rodrigues, E., Holmes, A. R., Cannon, R. D., Schmid, J. (2011, November). *Sex has no obvious net benefit for Candida albicans*. Verbal presentation at the New Zealand Microbiological Society Conference, Palmerston North, New Zealand.

Intellectual Property

Coates, D. E., Haines, S. R., & Suttie, J. M. (2011). Deer antler extract for promoting angiogenesis. (US 8,067,364).

Commissioned Report for External Body

Stuart, K., Gilmour, J., Broadbent, J., & Robson, B. (2011). *Oranga Waha: Oral health research priorities for Māori: A Literature Review*. Commissioned by Health Research Council and The Ministry of Health. Wellington, New Zealand: Te Rōpū Rangahau Hauora a Eru Pōmare. 67p.

Awarded Doctoral Degree

Farah, R. A. (2011). *The role of blood and serum proteins in the pathogenesis of molar-incisor hypomineralisation (DclinDent)*. University of Otago, Dunedin, New Zealand. 160p.

Total publications: 110

2012 Publications

OFFICE OF THE DEAN (DENTISTRY)

Journal - Research Article

Anderson, V. R., Pang, L. C., & Aarts, J. M. (2012). New Zealand dental technicians and continuing education: Findings from a qualitative survey. *New Zealand Dental Journal*, *108*(2), 47-54.

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Journal - Research Other

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- Yoganathan, V. (2012). Management of dens evaginatus in mandibular premolars: A case report. *New Zealand Dental Journal*, 108(3), (pp. 110-111).
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Conference Contribution - Verbal presentation and other Conference outputs

- Bradley, A., Kieser, J., Waddell, N., & Swain, M. (2012, August). *Morphoscopic fracture analysis in a model of child abuse*. Verbal presentation at the 6th European Academy of Forensic Science (EAFS) Conference: *Towards Forensic Science 2.0*, The Hague, The Netherlands.
- Hanning, S., Yu, T., Kieser, J., Jones, D. S., & Medicott, N. J. (2012, August-September). *Oily systems as saliva substitutes in xerostomia*. Verbal presentation at the New Zealand Hospital Pharmacists' Association Conference, Auckland, New Zealand.

Hanning, S., Yu, T., Medicott, N., Kieser, J., & Jones, D. (2012, November-December). *Rheological characterisation of lecithin-based emulsions for potential use as a saliva substitute in patients with xerostomia*. Verbal presentation at the 9th Biennial Globalization of Pharmaceuticals Education Network (GPEN) Conference, Melbourne, Australia.

Hutchinson, E. F., Kramer, B., & Kieser, J. A. (2012, August). *The effects of tongue growth on the fetal and pediatric mandible*. Verbal presentation at the 6th European Academy of Forensic Science (EAFS) Conference: *Towards Forensic Science 2.0*, The Hague, The Netherlands.

Kieser, D., Kieser, J., Horsfall, I., Carr, D., Swain, M., & Theis, J.-C. (2012, October). *Indirect ballistic fractures*. Verbal presentation at the New Zealand Orthopaedic Association (NZOA) Annual Scientific Meeting, Dunedin, New Zealand.

Total publications: 50

ORAL DIAGNOSTIC & SURGICAL SCIENCES

Journal - Research Article

Alsabeeha, N. H. M., Ma, S., & Atieh, M. A. (2012). Hydroxyapatite-coated oral implants: A systematic review and meta-analysis. *International Journal of Oral & Maxillofacial Implants*, 27(5), 1123-1130.

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Goldsmith, S. M., De Silva, R. K., Tong, D. C., & Love, R. M. (2012). Influence of a pedicle flap design on acute postoperative sequelae after lower third molar removal. *International Journal of Oral & Maxillofacial Surgery*, 41(3), 371-375. doi: 10.1016/j.ijom.2011.08.006

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Merrick, J., Chong, A., Parker, E., Roberts-Thomson, K., Misan, G., Spencer, J., Broughton, J., Jamieson, L. (2012). Reducing disease burden and health inequalities arising from chronic disease among Indigenous children: An early childhood caries intervention [Study protocol]. *BMC Public Health*, 12, 323. doi: 10.1186/1471-2458-12-323

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Conference Contribution - Published proceedings: Full paper

De Silva, H. L. (2012). Diagnosis and management of potentially malignant oral disorders. *Annals of the Royal Australasian College of Dental Surgeons*, 21, (pp. 60-62).

Kilgour, J. T., Jamieson, L., Cidro, J., Lawrence, H. P., Broughton, J. R., Tiakiwai, S.-J. T., Morgaine, K. C., Smith-Wilkinson, A. (2012). Community partnerships as research methodology. In D. Hikuroa, J. Ataria, M. Barrett, A. Boulton, M. Brewin, M. Cheung, & P. Whitinui (Eds.), *Proceedings of the International Indigenous Development Research Conference*, (pp. 129-136). Auckland, New Zealand: Ngā Pae o te Māramatanga.

Love, R. M. (2012). Persistent endodontic infection: Re-treatment or surgery? *Annals of the Royal Australasian College of Dental Surgeons*, 21, (pp. 103-105).

Nolan, A. (2012). Advances in gastroenterology: Opportunities and challenges for the dental practitioner. *Annals of the Royal Australasian College of Dental Surgeons*, 21, (pp. 58-59).

Conference Contribution - Published proceedings: Abstract

Anderson, V., Broughton, J., & Rapana, S. (2012). 'Internationalisation' or 'localisation'? Promoting dental students' cultural responsiveness through placements with Māori health providers. *Proceedings of the Joint International Conference of the Australian Association for Research in Education (AARE) and the Asia Pacific Educational Research Association (APERA)*. Retrieved from <http://aare-apera2012.com.au/>.

Atieh, M. A. (2012). Immediate single implant restorations in mandibular molar extraction sockets: A controlled clinical trial. *Journal of Clinical Periodontology*, 39(Suppl. 13), (pp. 49). doi: 10.1111/j.1600-051x.2012.01890_1.x

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Firth, N. (2012). The clinicopathological conference: Beyond a diagnostic exercise. *New Zealand Dental Journal*, 108(3), (pp. 110).

Firth, N. A., Friedlander, L., Parachuru, V., Kardos, T., Rich, A., & Seymour, G. (2012). Regulation of immune cells in oral lichen planus. *Journal of Dental Research*, 91(Spec Iss C), 169862. Retrieved from <http://www.dentalresearch.org>.

Firth, N., & Rich, A. (2012). Ameloblastic carcinoma: Report of two cases. *Pathology*, 44(Suppl. 1), (pp. S12-S13).

Gavidi, R. O., Rich, A., Firth, N., & Cox, B. (2012). Oral cancer: A silent killer amongst the Pacific Island community living in New Zealand. In C. Matthewson, M. Taumoepeau, G. Burnett, & I. Iati (Eds.), *Proceedings of the Pacific Postgraduate Symposium: Pacific Voices IX*, (pp. 19). Dunedin, New Zealand: Pacific Islands Centre, University of Otago.

Gavidi, R. O., Seo, B., & Firth, N. (2012). Dual pathology: A case involving the jaws. *Pathology*, 44(Suppl. 1), (pp. S13).

Hou, L. L., Holmes, A., Nolan, A., Lyons, K., & Cannon, R. (2012). Oral yeast carriage and saliva protein patterns of xerostomia subjects and matched controls. *New Zealand Dental Journal*, 108(4), (pp. 149).

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Suppiah, P., Cullinan, M. P., Nolan, A., Thomson, W. M., Stebbings, S., & Seymour, G. J. (2012). Oral health characteristics and oral-health-related quality of life in ankylosing spondylitis patients. *New Zealand Dental Journal*, 108(4), (pp. 151).

Tasmania, L., Love, R., & Cannon, R. (2012). Contact guidance of endodontic pathogens on micro-grooved polymethylmethacrylate discs. *New Zealand Dental Journal*, 108(4), (pp. 151).

Tiakiwai, S.-J., Berryman, K., Jamieson, L., Lawrence, H. P., Cidro, J., Cooper-Te Koi, R., Broughton, J., Morgaine, K., Kilgour, J. (2012). Community partnerships as research methodology. *Proceedings of the International Indigenous Development Research Conference*. Retrieved from <http://www.indigenousdevelopment2012.ac.nz/theme-programme>.

Yoganathan, V., Love, R., Monk, B., & Hale, J. (2012). Effect of the antimicrobial peptide BM2 on *Enterococcus faecalis* biofilms. *New Zealand Dental Journal*, 108(4), (pp. 152).

Zafar, S., Coates, D., Seymour, G., Drummond, B., Milne, T., & Cullinan, M. (2012). Effects of bisphosphonate on angiogenic gene expression in human gingival fibroblasts. *New Zealand Dental Journal*, 108(4), (pp. 150).

Conference Contribution - Poster Presentation (not in published proceedings)

McKinlay, E., Vernon, R., Crawford, R., Ashworth, N., McHugh, P., Pullon, S., Gray, L., Gallagher, P., Skinner, M., Windle, J., Foster Page, L., Broughton, J. (2012, August). *Interprofessional education: Establishing common ground to build interprofessional practice*. Poster session presented at the New Zealand College of Primary Health Care Nurses New Zealand Nurses Organisation (NZNO) Inaugural Conference, Hamilton, New Zealand.

McKinlay, E., Vernon, R., Crawford, R., Ashworth, N., McHugh, P., Pullon, S., Gray, L., Gallagher, P., Skinner, M., Windle, J., Foster Page, L., Broughton, J. (2012, August). *Interprofessional education: Establishing common ground to build interprofessional practice*. Poster session presented at the Interprofessional Health Studies Poster Conference, Auckland, New Zealand.

Conference Contribution - Verbal presentation and other Conference outputs

Anderson, V., Broughton, J., & Rapana, S. (2012, June). 'Oranga niho, oranga tinana, oranga whānau': Mobilising dental students through outplacements with Māori Oral Health Providers. Verbal presentation at the 3rd New Zealand Mobilities Symposium: Mobilities and Wellbeing, Auckland, New Zealand.

Broughton, J. R. (2012, August). *University of Otago research partnerships with Māori community oral health providers*. Verbal presentation at the Hui Poutama: Māori Research Symposium: Ka Haere Whakamua, Ka Titiro Whakamuri, Dunedin, New Zealand.

Firth, N. (2012, May). *The clinicopathological conference: Beyond a diagnostic exercise*. Keynote address at the Faculty of Dentistry Clinical Excellence Day, Dunedin, New Zealand.

Kemp, R., Day, A., Nolan, A., Tannock, G., & Gearry, R. (2012, June). *Who are we (Part I)*. Panel discussion at the Inaugural GutHealth Network Workshop, Dunedin, New Zealand.

Tong, D. (2012, September). *Shifting the paradigm: The TIMS device*. Verbal presentation at the Health and the Military Environment Colloquium, Dunedin, New Zealand.

Total publications: 44

ORAL REHABILITATION

Journal - Research Article

- Abduo, J., & Lyons, K. (2012). Effect of vertical misfit on strain within screw-retained implant titanium and zirconia frameworks. *Journal of Prosthodontic Research*, 56(2), 102-109. doi: 10.1016/j.jpor.2011.09.001
- Abduo, J., & Lyons, K. (2012). Clinical considerations for increasing occlusal vertical dimension: A review. *Australian Dental Journal*, 57(1), 2-10. doi: 10.1111/j.1834-7819.2011.01640.x
- Abduo, J., Lyons, K., Waddell, N., Bennani, V., & Swain, M. (2012). A comparison of fit of CNC-milled titanium and zirconia frameworks to implants. *Clinical Implant Dentistry & Related Research*, 14(Suppl. 1), e20-e29. doi: 10.1111/j.1708-8208.2010.00334.x
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Bradley, A., Kieser, J., Waddell, N., & Swain, M. (2012, August). *Morphoscopic fracture analysis in a model of child abuse*. Verbal presentation at the 6th European Academy of Forensic Science (EAFS) Conference: *Towards Forensic Science 2.0*, The Hague, The Netherlands.

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Total publications: 80

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Authored Book - Research

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Zafar, S., Coates, D., Seymour, G., Drummond, B., Milne, T., & Cullinan, M. (2012). Effects of bisphosphonate on angiogenic gene expression in human gingival fibroblasts. *New Zealand Dental Journal*, 108(4), (pp. 150).

Zafar, S., Coates, D., Seymour, G., Drummond, B., Milne, T., & Cullinan, M. (2012). Bisphosphonate and geranylgeraniol regulate angiogenic genes in human gingival fibroblasts. *Journal of Dental Research*, 91 (Spec Iss C), 169870. Retrieved from <http://www.dentalresearch.org>.

Conference Contribution - Poster Presentation (not in published proceedings)

Huschmann, F., Monk, B. C., Cannon, R. D., & Tyndall, J. D. A. (2012, August). *Overcoming resistance in fungal pathogens: Towards crystallization of the azole target from Candida albicans*. Poster session presented at the Queenstown Molecular Biology (QMB) Meetings, Queenstown, New Zealand.

Tomasiak, T. M., Monk, B. C., Keniya, M. V., Huschmann, F. U., Tyndall, J. D. A., O'Connell, III, J. D., Cannon, R. D., Stroud, R. M. (2012, November). *Structure of a full-length bitopic single membrane spanning cytochrome p450: The antifungal target lanosterol 14-alpha demethylase*. Poster session presented at the 4th Membrane Protein Technologies Meeting: NIH Roadmap to Membrane Protein Structures and Complexes, San Francisco, CA.

Conference Contribution - Verbal presentation and other Conference outputs

Bradley, A., Kieser, J., Waddell, N., & Swain, M. (2012, August). *Morphoscopic fracture analysis in a model of child abuse*. Verbal presentation at the 6th European Academy of Forensic Science (EAFS) Conference: *Towards Forensic Science 2.0*, The Hague, The Netherlands.

Drummond, B. (2012, September). *How significant is the impact of oral health on children's lives?* Verbal presentation at the Division of Health Sciences Research Forum: *Health Matters: Research Excellence* at Otago, Dunedin, New Zealand.

Monk, B. C., Tomasiak, T. M., Keniya, M. V., Huschmann, F. U., Tyndall, J. D. A., O'Connell, III, J. D., Cannon, R. D., Stroud, R. M. (2012, November). *A cytochrome P450 monospanner in the works: Structure of full-length yeast lanosterol 14 α -demethylase*. Verbal presentation at the 4th Membrane Protein Technologies Meeting: NIH Roadmap to Membrane Protein Structures and Complexes, San Francisco, CA.

Thomson, W. M., Broadbent, J., & Poulton, R. (2012, June). *Stability and consequences of dental anxiety trajectories to age 38*. Verbal presentation at the 90th General Session of the International Association for Dental Research (IADR), Iguazu Falls, Brazil.

OTHER RESEARCH OUTPUT

Inaugural Professorial Lecture

Drummond, B. (2012, July). *In and out of the mouths of babes*. University of Otago, Dunedin, New Zealand. [Inaugural Professorial Lecture].

Total publications: 134

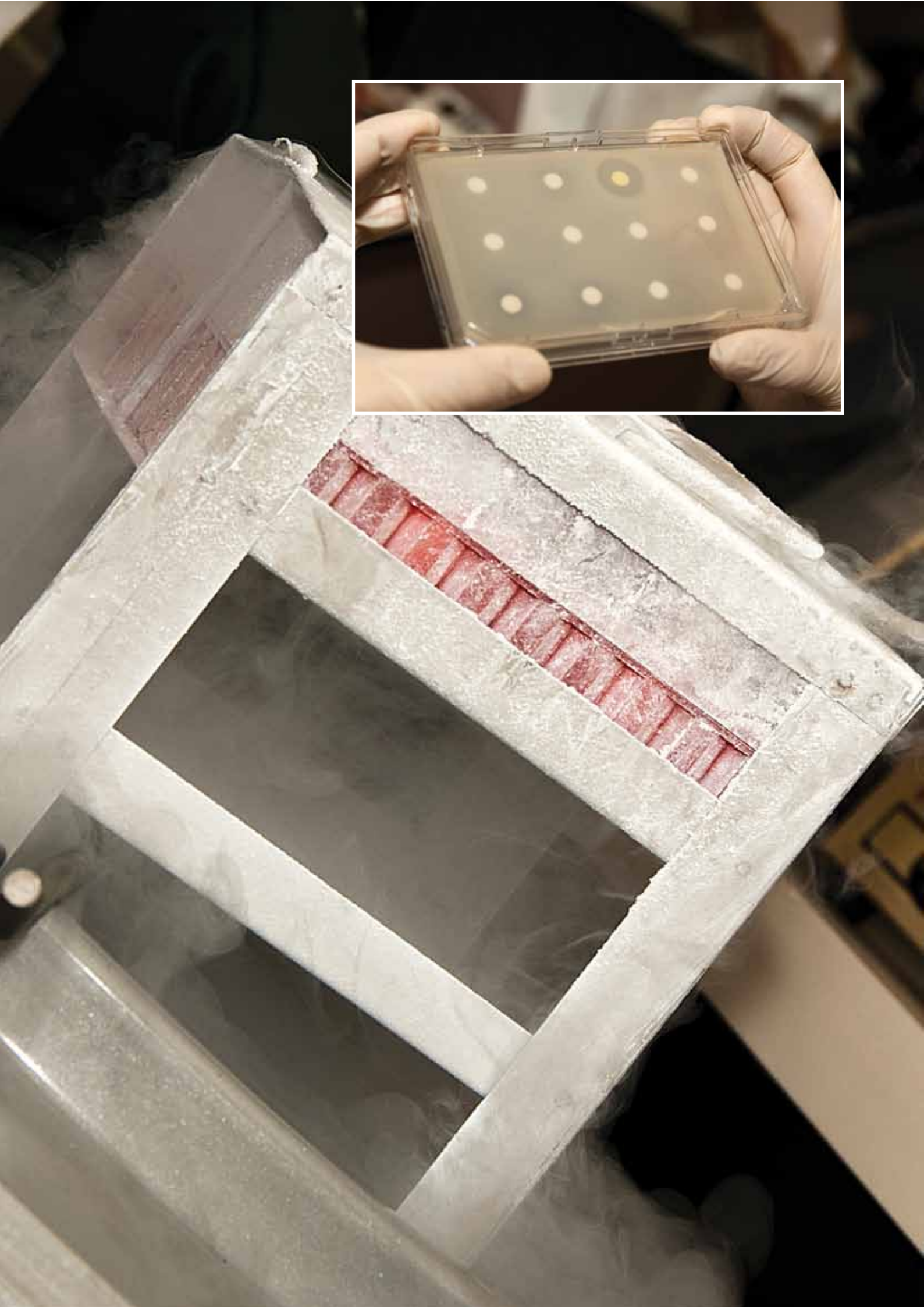
TECHNICAL SERVICES (DENTISTRY)

Journal - Research Article

Egan, J. G., & Swindells, S. A. (2012). A novel prosthodontic alternative for patients who are edentulous and have microstomia: A case report. *Special Care in Dentistry*, 32(4), 160-164. doi: 10.1111/j.1754-4505.2012.00256.x

Hanning, S., Motoi, L., Medicott, N., & Swindells, S. (2012). A device for the collection of submandibular saliva. *New Zealand Dental Journal*, 108(1), 4-8.

Total publications: 2



2011-12 Research funding

Successful funding applications submitted in 2011-12 (by project start/end date)

Start	End	Application	Funding Body Funding Round	Amount awarded	Investigator(s)	Department/ Affiliation
Jul 11	Jun 12	A novel approach to caries management in New Zealand children	Health Research Council of NZ (HRC) <i>Feasibility Study Grant</i>	\$146,826	Lyndie Foster Page Murray Thomson Dorothy Boyd	Oral Rehabilitation Oral Sciences Oral Sciences
Jul 11	Jun 12	British Society of Oral and Dental Research Conference 2011	Maurice and Phyllis Paykel Trust <i>Grant-in-Aid, June</i>	\$2,000	Lyndie Foster Page	Oral Rehabilitation
Jul 11	Jun 12	Effect of electrochemically modified surface of Titanium-Zirconium alloy implant on osseointegration: an in vitro and in vivo study	DENTSPLY Australia Pty Ltd <i>Research Fund</i>	\$3,133	Ajay Sharma Warwick Duncan	Oral Sciences Oral Sciences
Sep 11	Aug 12	Combatting resistance in emerging fungal pathogens	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$2,250	Joel Tyndall Brian Monk Richard Cannon	Pharmacy Oral Sciences Oral Sciences
Sep 11	Aug 12	Image analysis for dental research	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$14,845	Richard Cannon	Oral Sciences
Oct 11	Sep 12	Is the mid-palate of edentulous elders a suitable site for wide-bodied implants supporting over dentures? A Histomorphometric and micro-computerised tomography study of human cadavers	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$7,000	Allauddin Siddiqi Warwick Duncan Rohana De Silva Jules Kieser	Oral Sciences Oral Sciences Oral Diagnostics & Surgical Sciences Oral Sciences
Oct 11	Sep 12	A critical evaluation of titanium particle formation about implants and their role on implant longevity	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$14,397	Andrew Tawse-Smith Warwick Duncan Geoff Tompkins Michael Swain Claudine Stirling	Oral Sciences Oral Sciences Oral Sciences Oral Rehabilitation Chemistry

Start	End	Application	Funding Body Funding Round	Amount awarded	Investigator(s)	Department/ Affiliation
Oct 11	Sep 12	The role of <i>Candida albicans</i> in the clinicopathological behaviour of potentially malignant oral disorders	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$15,000	Harsha De Silva Richard Cannon Norman Firth Alison Rich Dayanath Dias Dhammika Vidanagama Hettige Perera	Oral Diagnostics & Surgical Sciences Oral Sciences Oral Diagnostics & Surgical Sciences Oral Diagnostics & Surgical Sciences University of Ruhuna University of Ruhuna University of Ruhuna
Oct 11	Sep 12	VEGF-A, RHOB and BMP-2 gene expression regulation in bisphosphonate treated human gingival fibroblasts	New Zealand Dental Association <i>Research Grant</i>	\$14,982	Sobia Zafar Mary Cullinan Bernadette Drummond Dawn Coates Gregory Seymour	Oral Sciences Oral Sciences Oral Sciences Oral Sciences Oral Sciences
Oct 11	Sep 12	'Oranga niho, oranga tinana, oranga whānau': What are the implications of final-year dental student outplacements with Māori Oral Health Providers for students, hosts and whānau	New Zealand Dental Association Research Foundation <i>Ministry of Health Research Grant</i>	\$24,988	Vivienne Anderson John Broughton Alison Rich Pauline Koopu Greg Keay	Oral Sciences Preventive & Social Medicine Oral Diagnostics & Surgical Sciences Tipu Ora Charitable Trust Ngati Hine Health Trust
Oct 11	Sep 14	A novel approach to caries management in children by resin infiltration	New Zealand Dental Association Research Foundation <i>Ministry of Health Research Grant</i>	\$54,587	Lyndie Foster Page Murray Thomson Michael Swain Don Schwass Alison Meldrum	Oral Rehabilitation Oral Sciences Oral Rehabilitation Oral Sciences Oral Sciences
Oct 11	Sep 12	Bisphosphonate related osteonecrosis of the jaw (BRONJ) and the role of osteoblasts	New Zealand Dental Association Research Foundation <i>Ministry of Health Research Grant</i>	\$22,211	Sobia Zafar Dawn Coates Bernadette Drummond Mary Cullinan Gregory Seymour	Oral Sciences Oral Sciences Oral Sciences Oral Sciences Oral Sciences

Start	End	Application	Funding Body Funding Round	Amount awarded	Investigator(s)	Department/ Affiliation
Oct 11	Sep 12	Targeting emerging fungal pathogens and combating resistance	New Zealand Pharmacy Education and Research Foundation <i>Project</i>	\$12,250	Joel Tyndall Brian Monk Richard Cannon	Pharmacy Oral Sciences Oral Sciences
Oct 11	Sep 12	The role of genetics in determining vertical craniofacial form	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$9,430	Joseph Antoun Mauro Farella Tony Merriman Murray Thomson	Oral Sciences Oral Sciences Biochemistry Oral Sciences
Oct 11	Sep 12	Continuous measurement of salivary pH using a novel indwelling wireless intraoral pH telemetry	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$15,000	Mauro Farella Jules Kieser	Oral Sciences Oral Sciences
Oct 11	Sep 12	Electrospun cottonwool-like nanocomposites for alveolar ridge preservation - an experimental study in sheep	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$15,000	Jinyi Liu Warwick Duncan Andrew Tawse-Smith Patrick Schmidlin	Oral Sciences Oral Sciences Oral Sciences University of Zurich
Nov 11	Oct 13	Is the salivary protein SPLUNC2 a target for reducing Candidiasis-related oral pathologies in head and neck cancer patients?	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$5,830	Richard Cannon Ann Holmes Patrick Dawes Yeen Lim	Oral Sciences Oral Sciences Surgical Sciences (DSM) Oral Rehabilitation
Nov 11	Oct 12	Genome sequencing of NCTC 8618 (ATCC 7073T), the type strain of <i>Streptococcus salivarius</i> , to provide insight into its highly unusual antimicrobial activity targeting Gram-negative oral pathogens	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$5,685	John Tagg Nicholas Heng Jo-Ann Stanton	Microbiology & Immunology Oral Sciences Anatomy
Dec 11	Nov 12	Proposals to improve oral health self-care outcomes for at-risk adults	Ministry of Health <i>Tender - Proposals to improve oral health self-care outcomes for at-risk adults</i>	\$230,332	Murray Thomson	Oral Sciences

Start	End	Application	Funding Body Funding Round	Amount awarded	Investigator(s)	Department/ Affiliation
Jan 12	Dec 12	The Interaction Styles of Dental Therapists in the Southern District Health Board Area: do their interaction styles change if they are trained in the Motivational Interviewing Approach?	New Zealand Dental Association Research Foundation <i>Ministry of Health Research Grant</i>	\$26,473	Alison Meldrum Dawn Coates Wendy Aitken Warwick Duncan	Oral Sciences Oral Sciences Human Nutrition Oral Sciences
Jan 12	Dec 12	Bisphosphonate related osteonecrosis of the jaw (BRONJ) and the role of osteoblasts	New Zealand Lottery Grants Board <i>Lottery Health - Research Project & Shared Equipment</i>	\$13,467	Dawn Coates Sobia Zafar Gregory Seymour Bernadette Drummond Mary Cullinan	Oral Sciences Oral Sciences Oral Sciences Oral Sciences Oral Sciences
Jan 12	Mar 13	Sir John Walsh Research Institute	University of Otago <i>Research Centres 2012</i>	\$25,000	Jules Kieser	Oral Sciences
Jan 12	Dec 12	Development of multispectral imaging based dental diagnostic devices	Maurice and Phyllis Paykel Trust <i>Grant-in-Aid (Project/ Equipment), March</i>	\$10,000	Lihong He Bruce Partridge Ruth Fitzgerald John Broughton Dara Shearer	Oral Rehabilitation Biotronics Otago Ltd Anthropology and Archaeology Preventive & Social Medicine Oral Sciences
Mar 12	Dec 12	AAEA 2012 Conference	Maurice and Phyllis Paykel Trust <i>Grant-in-Aid (Travel & Conference), March</i>	\$1,000	Anna Kim Nicholas Chandler	Oral Rehabilitation Oral Rehabilitation
Apr 12	Mar 13	The role of osteoclasts in Bisphosphonate Related Osteonecrosis of the Jaw (BRONJ)	Maurice and Phyllis Paykel Trust <i>Grant-in-Aid (Project/ Equipment), March</i>	\$8,000	Dawn Coates Sobia Zafar Mary Cullinan Bernadette Drummond Gregory Seymour	Oral Sciences Oral Sciences Oral Sciences Oral Sciences Oral Sciences
Apr 12	Dec 12	18th Congress of the International Society for Human and Animal Mycology, Berlin Germany	Maurice and Phyllis Paykel Trust <i>Grant-in-Aid (Travel & Conference), March</i>	\$1,500	Masakazu Niimi	Oral Diagnostics & Surgical Sciences

Start	End	Application	Funding Body Funding Round	Amount awarded	Investigator(s)	Department/ Affiliation
Jul 12	Jun 15	The Dunedin Multidisciplinary Study of Aging and Risk for Chronic Disease	Health Research Council of NZ (HRC) <i>Programme Extension</i>	\$5,665,540	Richie Poulton Murray Thomson Nigel Dickson Bob Hancox Jo Baxter Avshalom Caspi Terrie Moffitt Jude Sligo Georgie Salter Aroha Bolton Nat Davis Sandhya Ramrakha Michelle McCann Claire Cameron Jennie Connor Thea van Roode Antoinette Righarts Robyn Kydd Jonathan Broadbent Dara Shearer	Preventive & Social Medicine Oral Sciences Preventive & Social Medicine Preventive & Social Medicine Preventive & Social Medicine Duke University Duke University Preventive & Social Medicine Preventive & Social Medicine Preventive & Social Medicine Preventive & Social Medicine Preventive & Social Medicine Preventive & Social Medicine Preventive & Social Medicine Preventive & Social Medicine Preventive & Social Medicine Preventive & Social Medicine Oral Sciences Oral Sciences
Jul 12	Jun 13	Colonisation of acrylic denture fitting surfaces by <i>Candida</i> species	DENTSPLY Australia Pty Ltd <i>Research Fund</i>	\$1,250	Nicholas Knight Richard Cannon Karl Lyons Vincent Bennani	Oral Rehabilitation Oral Sciences Oral Rehabilitation Oral Rehabilitation
Jul 12	Jun 13	New Zealand Microbiological Society 2012 Conference	Maurice and Phyllis Paykel Trust <i>Conference Support Grant, June</i>	\$4,000	Richard Cannon	Oral Sciences

Start	End	Application	Funding Body Funding Round	Amount awarded	Investigator(s)	Department/ Affiliation
Jul 12	Jun 13	Could surface modification of titanium-zirconium alloy by anodization improve osseointegration?	Wishbone Trust <i>Research Grant</i>	\$14,560	Warwick Duncan Ajay Sharma Neil Waddell	Oral Sciences Oral Sciences Oral Rehabilitation
Jul 12	Jun 13	Effect of electrochemically modified surface of Titanium-Zirconium alloy implant on osseointegration: an in vitro and in vivo study	DENTSPLY Australia Pty Ltd <i>Research Fund</i>	\$1,000	Ajay Sharma Warwick Duncan	Oral Sciences Oral Sciences
Sep 12	Aug 13	A laboratory investigation of the infiltration of resins of different molecular weights into hypomineralised enamel in teeth with Molar-Incisor Hypomineralisation	New Zealand Dental Association Research Foundation <i>Ministry of Health Oral Research Fund</i>	\$9,040	Bernadette Drummond Rami Farah Michael Swain	Oral Sciences Oral Sciences Oral Rehabilitation
Oct 12	Sep 13	How does submersion in a seawater environment affect the retrieval of useful DNA from teeth?	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$15,000	Alison Rich Warwick Duncan Jules Kieser Sarah Drake	Oral Diagnostics & Surgical Sciences Oral Sciences Oral Sciences Oral Diagnostics & Surgical Sciences
Oct 12	Sep 13	Angiogenic factors in oral squamous cell carcinoma	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$14,422	Olive Allsobrook Alison Rich Lara Friedlander V.Praveen Parachuru Gregory Seymour	Oral Diagnostics & Surgical Sciences Oral Diagnostics & Surgical Sciences Oral Rehabilitation Oral Diagnostics & Surgical Sciences Oral Sciences

Start	End	Application	Funding Body Funding Round	Amount awarded	Investigator(s)	Department/ Affiliation
Oct 12	Sep 13	Oral Squamous Cell Carcinoma: Comparing this disease in New Zealand and the Fiji Islands	New Zealand Dental Association Research Foundation <i>Ministry of Health Oral Research Fund</i>	\$4,200	Alison Rich Ratu Gavidia Brian Cox	Oral Diagnostics & Surgical Sciences Oral Diagnostics & Surgical Sciences Preventive & Social Medicine
Oct 12	Sep 13	Characterization of Th17 cells in oral mucosal lichen planus using immunohistochemistry, immunofluorescence and real-time reverse transcriptase polymerase chain reaction	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$14,981	Ramya Javvadi Alison Rich V.Praveen Parachuru Gregory Seymour	Oral Diagnostics & Surgical Sciences Oral Diagnostics & Surgical Sciences Oral Diagnostics & Surgical Sciences Oral Sciences
Oct 12	Sep 13	Genetics of the long face: The role of IGF-1 receptor gene	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$2,500	Joseph Antoun Mauro Farella Murray Thomson Tony Merriman	Oral Sciences Oral Sciences Oral Sciences Biochemistry
Oct 12	Sep 13	UMF manuka honey as a subgingival delivery device in the treatment of chronic periodontitis	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$15,000	Helen English Warwick Duncan Patrick Schmidlin Peter Molan	Oral Sciences Oral Sciences University of Zurich University of Waikato
Oct 12	Sep 13	The role of osteoclasts in Bisphosphonate Related Osteonecrosis of the Jaw (BRONJ)	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$6,991	Sobia Zafar Dawn Coates Gregory Seymour Mary Cullinan Bernadette Drummond	Oral Sciences Oral Sciences Oral Sciences Oral Sciences Oral Sciences
Oct 12	Sep 13	Endoplasmic Reticulum Stress and Unfolded Protein Response in the Pathogenesis of Oral Squamous Cell Carcinoma	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$15,000	Benedict Seo Dawn Coates Alison Rich Gregory Seymour	Oral Diagnostics & Surgical Sciences Oral Sciences Oral Diagnostics & Surgical Sciences Oral Sciences

Start	End	Application	Funding Body Funding Round	Amount awarded	Investigator(s)	Department/ Affiliation
Oct 12	Sep 13	DNA methylation status of osteogenic and angiogenic genes in gingival tissues of smokers and non-smokers	New Zealand Dental Association Research Foundation <i>Research Grant</i>	\$14,028	Trudy Milne Mary Cullinan Gregory Seymour Stephanie Park	Oral Sciences Oral Sciences Oral Sciences Oral Sciences
Oct 12	Sep 13	Living with dry mouth - Sjogren's Syndrome patients' perspectives	New Zealand Dental Association Research Foundation <i>Ministry of Health Oral Research Fund</i>	\$6,256	Anita Nolan Shelagh Ferguson Murray Thomson Joanna Ngo	Oral Diagnostics & Surgical Sciences Marketing Oral Sciences Oral Diagnostics & Surgical Sciences
Oct 12	Sep 13	Colonisation of acrylic denture fitting surfaces by <i>Candida</i> species	New Zealand Dental Association Research Foundation <i>Ministry of Health Oral Research Fund</i>	\$8,646	Richard Cannon Nicholas Knight Karl Lyons Vincent Bennani	Oral Sciences Oral Rehabilitation Oral Rehabilitation Oral Rehabilitation
Oct 12	Sep 13	Oral Bacterial Profiling of Children Before and After Comprehensive Restorative Treatment for Severe Early Childhood Caries	New Zealand Dental Association Research Foundation <i>Ministry of Health Oral Research Fund</i>	\$23,477	Nicholas Heng Bernadette Drummond MaryCullinan Jo-Ann Stanton	Oral Sciences Oral Sciences Oral Sciences Anatomy
Oct 12	Mar 14	Do multifaceted admission processes predict performance of students in two Australasian dental programmes?	Undergraduate Medicine & Health Sciences Test (UMAT) Board <i>Major Project (Category 2)</i>	\$65,121	Alison Rich	Oral Diagnostics & Surgical Sciences
Jan 13	Jun 14	Dental professionals' experiences and perspectives on the provision of domiciliary oral health services for older adults	New Zealand Dental Association Research Foundation <i>Ministry of Health Oral Research Fund</i>	\$14,060	Moira Smith Murray Thomson	Public Health (UOW) Oral Sciences
Jan 13	Dec 13	Dental professionals' perspectives on the provision of domiciliary oral health services for older adults	University of Otago <i>University of Otago Research Grants 2013</i>	\$17,965	Murray Thomson Moira Smith	Oral Sciences Public Health (UOW)

Start	End	Application	Funding Body Funding Round	Amount awarded	Investigator(s)	Department/ Affiliation
Jan 13	Dec 14	Merging anatomical and fluorescence molecular imaging to investigate craniofacial growth	University of Otago <i>University of Otago Research Grants 2013</i>	\$35,000	Mauro Farella Warwick Duncan Jules Kieser Igor Meglinski	Oral Sciences Oral Sciences Oral Sciences Physics
Jan 13	Dec 13	A rush of blood to the head: psychological factors in the analysis of bloodstain evidence	University of Otago <i>University of Otago Research Grants 2013</i>	\$36,828	Rachel Zajac Jules Kieser Michael Taylor	Psychology Oral Sciences ESR
Jan 13	Dec 13	Validation and evaluation of a novel multispectral imaging system for dental diagnosis	University of Otago <i>University of Otago Research Grants 2013</i>	\$32,670	Lihong He Bruce Partridge	Oral Rehabilitation Biotronics Otago Ltd
Jan 13	Dec 13	Periosteum under stress: The effects of denture-induced gingival pressure on jaw bone resorption	University of Otago <i>University of Otago Research Grants 2013</i>	\$32,768	Sunyoung Ma Michael Swain Warwick Duncan Jules Kieser Nicholas Chandler	Oral Rehabilitation Oral Rehabilitation Oral Sciences Oral Sciences Oral Rehabilitation
Jan 13	Dec 13	Wear at the titanium-zirconia implant-abutment interface and its effect on peri-implant tissues	University of Otago <i>University of Otago Research Grants 2013</i>	\$20,276	Andrew Tawse-Smith Sunyoung Ma Michael Swain Warwick Duncan Alison Rich	Oral Sciences Oral Rehabilitation Oral Rehabilitation Oral Sciences Oral Diagnostics & Surgical Sciences
Jan 13	Dec 13	Adipose-derived multipotent progenitor cells for bone regeneration on titanium devices	Otago Medical Research Foundation <i>Jack Thomson Arthritis Fund</i>	\$29,473	Warwick Duncan Diogo Zanicotti Dawn Coates Gregory Seymour	Oral Sciences Oral Sciences Oral Sciences Oral Sciences
Jan 12	Dec 12	Bisphosphonate related osteonecrosis of the jaw (BRONJ) and the role of osteoblasts	New Zealand Lottery Grants Board <i>Lottery Health - Research Project & Shared Equipment</i>	\$13,467	Dawn Coates Sobia Zafar Gregory Seymour Bernadette Drummond Mary Cullinan	Oral Sciences Oral Sciences Oral Sciences Oral Sciences Oral Sciences

Start	End	Application	Funding Body Funding Round	Amount awarded	Investigator(s)	Department/ Affiliation
Apr 13	Mar 14	Oral pH monitoring in children with dental erosion	New Zealand Lottery Grants Board <i>Lottery Health - Research Project & Shared Equipment</i>	\$17,000	Bernadette Drummond Mauro Farella Jules Kieser Jonathan Campbell	Oral Sciences Oral Sciences Oral Diagnostics & Surgical Sciences Oral Sciences
Apr 13	Mar 15	Adipose-derived multipotent progenitor cells on titanium surfaces	New Zealand Lottery Grants Board <i>Lottery Health - Research Project & Shared Equipment</i>	\$37,300	Dawn Coates Warwick Duncan Gregory Seymour Diogo Zanicotti	Oral Sciences Oral Sciences Oral Sciences Oral Sciences
Apr 13	Mar 15	Does anodisation of titanium-zirconium alloy improve anchorage to bone for implanted prosthetic devices?	New Zealand Lottery Grants Board <i>Lottery Health - Research Project & Shared Equipment</i>	\$23,800	Warwick Duncan Ajay Sharma Neil Waddell	Oral Sciences Oral Sciences Oral Rehabilitation
May 13	Apr 15	Wireless monitoring of oral pH and Bruxism	New Zealand Lottery Grants Board <i>Lottery Health - Research Project & Shared Equipment</i>	\$49,500	Mauro Farella Michael Paulin Jules Kieser	Oral Sciences Zoology Oral Diagnostics & Surgical Sciences
May 13	Apr 15	Occupational health of front line workers in Christchurch	New Zealand Lottery Grants Board <i>Lottery Health - Research Project & Shared Equipment</i>	\$45,000	Kirsten Lovelock David McBride Daniel Shepherd Rex Billington Darryl Tong Andrew Gray Helen Harcombe Bronwen McNoe	Preventive & Social Medicine Preventive & Social Medicine Auckland University of Technology Auckland University of Technology Oral Diagnostics & Surgical Sciences Preventive & Social Medicine Preventive & Social Medicine Preventive & Social Medicine

Start	End	Application	Funding Body Funding Round	Amount awarded	Investigator(s)	Department/ Affiliation
Sep 13	Aug 16	The genetics of dentofacial dysplasia	Health Research Council of NZ (HRC) <i>Emerging Researcher First Grant</i>	\$149,462	Joseph Antoun Mauro Farella Tony Merriman Murray Thomson	Oral Sciences Oral Sciences Biochemistry Oral Sciences
Oct 13	Sep 16	Structure-directed antifungal discovery	Health Research Council of NZ (HRC) <i>Project - Full Application</i>	\$1,190,954	Brian Monk Richard Cannon Joel Tyndall Mikhail Keniya Edmond Fleischer Anette Klinger Robert Stroud Thomas Tomasiak	Oral Sciences Oral Sciences Pharmacy Oral Sciences MicroCombi Chem MicroCombi Chem University of California, San Francisco University of California, San Francisco

Totals awarded exclude GST. Principal Investigators are first-named.

Imager.Z2

AX

The control panel features a large touch screen with a blue-themed software interface. The interface includes a sidebar menu on the left with the following items: Home, Favorite, Revolver, Light, Automatic, XYZ, and Display. The main display area is divided into sections for 'Objectives' and 'Re-lector'. The 'Objectives' section contains a grid of buttons for 5x, 10x, 20x, 40x Oil, and 63x Oil. The 'Re-lector' section contains a button for 5x. To the right of the objective grid are buttons for 'Load position', 'AL Illumination' (with 'Off' and 'On' sub-buttons), and 'TL Illumination' (with 'Off' and 'On' sub-buttons). Below these sections, the screen displays 'Pos. 3: Pin Apo 20x/0.8 DIC II' and 'Config Manager'. At the bottom of the screen, there is a status bar showing '10x/0.8 DIC II', '38 GFP', and 'Off: B'.

Objectives	Re-lector
5x	10x
20x	40x Oil
63x Oil	5x

Load position
AL Illumination
Off On
TL Illumination
Off On

Pos. 3: Pin Apo 20x/0.8 DIC II

Config Manager

10x/0.8 DIC II 38 GFP Off: B

PhD enrolments 2011-2012

Family Name	Preferred Name	Primary Department	Primary Supervisor	List of All Supervisors	Thesis Title	Status (end 2012)
<i>Degrees conferred or awarded in 2011-12</i>						
Atieh	Momen	Sir John Walsh Research Institute	Associate Professor Warwick Duncan	W. Duncan, M. Cullinan, R.K. De Silva and D. Schwass	Immediate single implant restorations in mandibular molar extraction sockets	Conferred
Broadbent	Jonathan	Oral Sciences	Professor Murray Thomson	W.M.Thomson, K.M.S.Ayers and J. Kieser	Oral health disparities to the fourth decade of life	Conferred
Dickson	Gemma	Biochemistry, OSMS	Associate Professor Russell Poulter	R. Poulter; J. Kieser, K. Probert and E. Maas	Microbial marine decomposition of human and animal remains	Conferred
Farah	Rami	Oral Sciences	Professor Bernadette Drummond	B. Drummond, R. Cook, M. Swain and S. Williams	Structural, biochemical and biomechanical analysis of molar-incisor hypomineralisation	Conferred
George	Amanda	Anthropology and Archaeology	Professor Richard Walter	R. Walter and J. Kieser	Dental pathology profile of pre-European Māori and Moriori	Awarded
Lyons	Karl	Sir John Walsh Research Institute	Professor Richard Cannon	R. Cannon and R. Love	Microbial adhesion to maxillary obturator materials	Conferred
Mohd Bakri	Marina	Sir John Walsh Research Institute	Professor Richard Cannon	R. Cannon, A. Holmes and A. Rich	The expression of <i>Candida albicans</i> acetaldehyde producing enzymes in <i>C. albicans</i> infected mucosal lesions: A potential role in some oral cancers	Conferred
Nguyen	Albert	Pharmacy	Dr Joel Tyndall	J. Tyndall and B. Monk	Investigation of CAP proteins: GLI pathogenesis-related protein 1, Tex31 and Pry3p	Conferred
Parachuru	Praveen	Sir John Walsh Research Institute	Professor Gregory Seymour	G.J. Seymour, D. Coates, T. Milne, A. Rich, M. Cullinan and N. Heng	Characterisation of regulatory T-cells and Th17 cells in chronic inflammatory periodontal disease	Awarded
Tholey	Michael	Sir John Walsh Research Institute	Professor Michael Swain	M. Swain, J. Kieser and N. Thiel	The system Y-TZP and its porcelain. The interface and firing influences of the porcelain on the "chipping"	Conferred

Family Name	Preferred Name	Primary Department	Primary Supervisor	List of All Supervisors	Thesis Title	Status (end 2012)
Waddell	Neil	Sir John Walsh Research Institute	Professor Michael Swain	M. Swain and J. Kieser	An investigation of the causes of clinical failure of soldered bar attachment systems in implant supported overdentures	Conferred
<i>Other PhD students enrolled in 2011-12</i>						
Alansary	Mohammed	Sir John Walsh Research Institute	Professor Bernadette Drummond	B. Drummond, D. Coates, M. Cullinan, L. Friedlander and G.J. Seymour	Pulp/dentin complex regeneration in non-vital immature permanent teeth using extracted primary teeth pulpal stem cells (EPTPSC). In vitro characterisation and case series studies	Provisional
Avadhani	Avadhoot	Sir John Walsh Research Institute	Professor Alison Rich	A. Rich, T. Milne and G.J. Seymour	Role of Treg cells, Th17 cells, TLRs and NF-kB in oral squamous cell carcinoma and associated lymph nodes	Provisional
Coldea	Andrea	Sir John Walsh Research Institute	Professor Michael Swain	M. Swain, J. Kieser and N. Thiel	Suitability of resin-ceramic interpenetrating network composites for CAD/CAM based dental restorative material	Confirmed
De Castro	Therese	Sir John Walsh Research Institute	Professor Jules Kieser	J. Kieser, D. Carr, M. Taylor and W. Duncan	Statistical analysis of bloodstain formation and investigation of the interaction of blood and apparel fabrics	Confirmed
Friedlander	Lara	Sir John Walsh Research Institute	Professor Alison Rich	A. Rich, M. Cullinan, G.J. Seymour, D. Coates and B. Drummond	The characterization and behaviour of dental pulp cells from immature permanent and deciduous teeth when co-cultured with angiogenic growth factors	Confirmed
Godoy Zanicotti	Diogo	Sir John Walsh Research Institute	Associate Professor Warwick Duncan	W. Duncan, D. Coates and G.J. Seymour	Adipose-derived stem cells for bone regeneration around titanium implants	Confirmed
Hanning	Sara	Pharmacy	Associate Professor Natalie Medicott	N. Medicott and J. Kieser	Oil based xerostomia formulations	Confirmed

Family Name	Preferred Name	Primary Department	Primary Supervisor	List of All Supervisors	Thesis Title	Status (end 2012)
Healey	David	Sir John Walsh Research Institute	Professor Murray Thomson	W.M.Thomson and R. Gauld	Expectations and satisfaction with orthodontic treatment	Confirmed
Huschmann	Franziska	Pharmacy	Dr Joel Tyndall	J.Tyndall, R. Cannon, K. Krause and B. Monk	Investigating resistance in infectious disease	Confirmed
Jalaludin	Anil	Chemistry	Professor Jim McQuillan	A.J. McQuillan, P. Bremer and B. Monk	ATR-IR spectroscopic studies of chlorhexidine, lysozyme, <i>Micrococcus luteus</i> films and their interactions at solid-liquid interfaces	Under examination
Kennedy	Darnell	Anatomy, OSMS	Dr Jo-Ann Stanton	J. Stanton, J. Kieser, G. Tompkins and N. Heng	Microbial analysis of bite marks by sequence comparison of streptococca DNA	Under examination
Kieser	David	Orthopaedic Surgery, DSM	Professor Jean-Claude Theis	J.Theis, M. Swain, J. Kieser and M. Taylor	The factors in high velocity orthopaedic trauma	Confirmed
Li	Kai	Geology	Professor David Prior	D. Prior, M. Swain and J.N. Waddell	Micro-structural evolution of dental ceramics as a result of multiple heat treatments	Confirmed
Lindstrom	Anne-Christine	Sir John Walsh Research Institute	Professor Jules Kieser	J. Kieser, W. Duncan, J. Hoogerwerff and J.N. Waddell	Morphological analysis of experimentally produced bony wounds from ballistic impact	Confirmed
Loch Santos da Silva	Carolina	Geology	Professor Ewan Fordyce	R. Fordyce and J. Kieser	Morphology, structure and evolution of teeth in fossil and modern odontocetes (Cetacea)	Under examination
Ma	Sunyoung	Sir John Walsh Research Institute	Professor Michael Swain	M. Swain, W. Duncan and W.M. Thomson	Alveolar ridge resorption and implant prostheses	Confirmed
Shankar	Madhu	Pharmacy	Dr Joel Tyndall	J.Tyndall and B. Monk	Riboflavin biosynthesis pathway as an antifungal drug target	Confirmed
Mohd Hussaini	Haizal	Sir John Walsh Research Institute	Professor Alison Rich	A. Rich, N. Firth and G.J. Seymour	Immune responses in primary oral squamous cell carcinoma and lymph node metastasis	Under examination

Family Name	Preferred Name	Primary Department	Primary Supervisor	List of All Supervisors	Thesis Title	Status (end 2012)
Nordin	Norhasnida	Sir John Walsh Research Institute	Professor Murray Thomson	W.M.Thomson and L. Foster Page	Oral health-related quality of life (OHRQoL) in young children and their families	Confirmed
Osman	Reham	Sir John Walsh Research Institute	Professor Michael Swain	M. Swain, W. Duncan, S. Ma, R.K. De Silva and W.M.Thomson	Prosthetic outcomes of Zirconia implants supporting overdentures	Under examination
Pardesi	Bikiran	Sir John Walsh Research Institute	Dr Geoffrey Tompkins	G.Tompkins, N. Heng, I. Lamont and B. Monk	Identification and characterization of the high-affinity heme-binding site expressed by <i>Porphyromonas gingivalis</i>	Confirmed
Quick	Andrew	Sir John Walsh Research Institute	Professor Jules Kieser	J. Kieser, P. Herbison, G. Johnson and M. Farella	The influence of orthodontic and orthognathic therapy on mandibular motion	Confirmed
Rodrigues	Ely	Sir John Walsh Research Institute	Professor Richard Cannon	R. Cannon, A. Holmes and J. Schmid	<i>Candida albicans</i> : sex and survival in a rat model of colonisation	Under examination
Sagatova	Alia	Sir John Walsh Research Institute	Dr Brian Monk	B. Monk, M. Keniya, J. Tyndall and R. Cannon	Discovery and development of Provisional multifunctional triazole drugs	
Schwass	Don	Sir John Walsh Research Institute	Professor Michael Swain	M. Swain, J. Kieser, C. Meledandri and G. Tompkins	Novel application of silver nanoparticles for prevention and management of dental caries	Confirmed
Seo	Benedict	Sir John Walsh Research Institute	Professor Alison Rich	A. Rich, D. Coates and G.J. Seymour	Unfolded protein response in the tumorigenesis of oral squamous cell carcinoma	Confirmed
Sharma	Ajay	Sir John Walsh Research Institute	Associate Professor Warwick Duncan	W. Duncan, J.N. Waddell and G.J. Seymour	Effect of electrochemically modified titanium-zirconium alloy implant surface on osseointegration: an <i>in vitro</i> and <i>in vivo</i> study	Confirmed
Shearer	Dara	Sir John Walsh Research Institute	Professor Murray Thomson	W.M.Thomson, J. Mann and R. Poulton	Longitudinal associations between periodontal disease and glycaemic control	Confirmed

Family Name	Preferred Name	Primary Department	Primary Supervisor	List of All Supervisors	Thesis Title	Status (end 2012)
Siddiqi	Allauddin	Sir John Walsh Research Institute	Associate Professor Warwick Duncan	W. Duncan, R.K. De Silva and J. Kieser	Surgical and peri-implant outcomes of ceramic implant overdentures	Under examination
Symon	Vanda	Science Communication	Professor Jean Fleming	J. Fleming, J. Kieser, N. Medlicott and N. Peart	Fact and fiction: Communicating science through the crime fiction of Ngaio Marsh	Confirmed
Tawse-Smith Alturo	Andrew	Sir John Walsh Research Institute	Associate Professor Warwick Duncan	W. Duncan, M. Swain, G. Tompkins, A. Rich, G.J. Seymour and J.L. Wennstrom	A critical evaluation of titanium particle formation about implants and their role on implant longevity	Confirmed
Tong	Darryl	Sir John Walsh Research Institute	Professor Robert Love	R. Love, T. Brooking and R. Beirne	An evidence-based analysis of maxillofacial war injuries and its role in contemporary surgery	Confirmed
White	Samuel	Biochemistry, OSMS	Associate Professor Russell Poulter	R. Poulter, S. Cordiner and J. Kieser	Resolution of mitochondrial mixtures	Confirmed
Yellagunda Ramalinge Gowda	Sujan	Sir John Walsh Research Institute	Dr Brian Monk	B. Monk, R. Cannon and K. Niimi	Heterologous expressions of <i>Homo sapiens</i> ABCG2 (HsABCG2) in yeast	Confirmed
Zafar	Sobia	Sir John Walsh Research Institute	Associate Professor Mary Cullinan	M. Cullinan, D. Coates, B. Drummond and G.J. Seymour	Effect of bisphosphonates on oral tissues	Confirmed

DClinDent enrolments 2011-2012

Family Name	Preferred Name	Primary Department	Primary Supervisor	List of All Supervisors	Thesis Title	Status (end 2012)
<i>Degrees conferred or awarded in 2011-12</i>						
Abdul Halim	Rohaida	Oral Sciences	Professor Bernadette Drummond	B Drummond and W.M.Thomson	Identification of factors in the natal and neonatal period influencing enamel development in the permanent first molars and incisors	Conferred
Adsett	Luke	Oral Diagnostic & Surgical Sciences	Professor Jules Kieser	J. Kieser, D.Tong, WMThomson and J Broughton	Patterns and trends in facial fractures in New Zealand	Conferred
Al-Amleh	Basil	Oral Rehabilitation	Professor Michael Swain	M. Swain, V. Bennani and K. Lyons	Influence of cooling rate on residual stresses and chipping of porcelain on zirconia restorations	Conferred
Al-Dameh	Ala	Oral Rehabilitation	Professor Robert Love	R. Love and M. Swain	Root canal preparation with two different rotary systems: Comparative study assessed by micro-computed tomography	Conferred
Al-Harthi	Latfiya	Oral Sciences	Professor Murray Thomson	W.M.Thomson, J. Leichter, M. Cullinan	The impact of periodontitis on oral-health-related quality of life among Omani teachers	Conferred
Balaji	Karthika	Dentistry	Professor Bernadette Drummond	B. Drummond, M. Cullinan, N. Heng and A. Meldrum	Oral health in children with Down Syndrome and their family members. A comparative study.	Conferred
Batra	Anuj	Oral Sciences	Professor Bernadette Drummond	B. Drummond, M. Swain and J. Kieser	Effect of sodium hypochlorite and Tooth Mousse on hypomineralised enamel in Molar Incisor Hypomineralisation	Conferred
Chen	Eric	Oral Rehabilitation	Professor Robert Love	R. Love, D. Purton and G. Tompkins	Phenotypic identification of toll-like receptor 2 expressing cells in refractory periapical granuloma of endodontic origin	Conferred

Family Name	Preferred Name	Primary Department	Primary Supervisor	List of All Supervisors	Thesis Title	Status (end 2012)
D'Mello	Giselle	Oral Sciences	Professor Bernadette Drummond	B. Drummond and W.M.Thomson	Long-term oral and general health outcomes in adolescents who had extensive decay in early childhood	Conferred
Farah	Rami	Oral Sciences	Professor Bernadette Drummond	B. Drummond, B. Monk and M. Swain	The role of blood and serum proteins in the pathogenesis of molar-incisor hypomineralisation	Conferred
Farland	Guy	Oral Sciences	Professor Jules Kieser	J. Kieser, M. Swain and C. Bolter	Under pressure: Generic and individual intra-oral pressure profiles in liquid swallows	Conferred
Hasmun	Noren	Dentistry	Professor Bernadette Drummond	B. Drummond, M. Cullinan, N. Heng and G. Seymour	Effects of environmental tobacco smoke on preschool oral health	Conferred
Hidayat	Faizal	Dentistry	Associate Professor Mary Cullinan	M. Cullinan, J. Leichter, N. Heng and G. Seymour	Salivary transcriptome biomarkers: for the identification of periodontitis susceptibility	Awarded
Hou	Xiao	Oral Rehabilitation	Professor Richard Cannon	R. Cannon, A. Holmes and K. Lyons	Oral yeast carriage and salivary protein profiles in xerostomia subjects and in age-and gender-matched controls	Conferred
Jack	Hannah	Oral Sciences	Professor Mauro Farella	M. Farella and J. Kieser	The effect of incremental lower lip advancement on intraoral pressures	Conferred
Kim	Anna	Oral Rehabilitation	Associate Professor Nick Chandler	N.P.Chandler, L. Friedlander and P.Herbison	The resected root end: is what you see what you get? A naked eye, optical and SEM study	Conferred
Kim	Ryan	Oral Sciences	Associate Professor Warwick Duncan	W. Duncan, D. Coates, T. Milne, M. Cullinan, A. Tawse-Smith, J. Leichter and A. Rich	WNT expression during osseointegration of titanium dental implants	Conferred
Law	Ching	Oral Rehabilitation	Professor Michael Swain	M. Swain, V. Bennani, K. Lyons	Mandibular deformation in a partially dentate mandible with and without restoration with a fixed implant restoration	Conferred

Family Name	Preferred Name	Primary Department	Primary Supervisor	List of All Supervisors	Thesis Title	Status (end 2012)
Lee	Ahreum	Oral Rehabilitation	Professor Michael Swain	M. Swain and K.M. Lyons	Wear behaviour of human enamel opposing lithium disilicate glass ceramic and type III gold	Conferred
Ling	Guo	Oral Diagnostic & Surgical Sciences	Professor Robert Love	R. Love and E. MacFadyen	Oral health of older people admitted to hospital for assessment	Conferred
Ma	Sunyoung	Dentistry	Associate Professor Alan Payne	A.G.T. Payne, W.M. Thomson and R. de Silva	Marginal bone loss around two implants supporting mandibular overdentures	Conferred
McNee	Cameron	Oral Sciences	Professor Mauro Farella	M. Farella, J. Kieser and S. Milosavljevic	An electromyographic insight into the behaviour of neck and shoulder muscles of dental students during standardised conditions and in their natural environments	Conferred
Petelo	Joseph	Dentistry	Professor Jules Kieser	J. Kieser, W. Harding and H. Buckley	Aspects of dental development and skeletal maturation in New Zealand Polynesian children and adolescents	Conferred
Rodricks	Rohan	Dentistry	Dr Geoffrey Tompkins	G. Tompkins, J. Boyens and N. Heng	Haem and reactive oxygen species in killing of <i>Porphyromonas gingivalis</i> and <i>Prevotella intermedia</i>	Conferred
Schwass	Donald	Dentistry	Professor Michael Swain	M. Swain, D. Purton and J. Leichter	Micro-CT application for quantifying fluorescence controlled Er:YAG laser ablation of carious dentine	Conferred
Seo	Benedict	Oral Diagnostic & Surgical Sciences	Professor Alison Rich	A. Rich, G. Seymour, D. Coates and J. Leichter	Endoplasmic reticulum stress and Russell bodies: Study of the relationship using a periodontal inflammation model	Conferred
Shah Mansouri	Reza	Oral Rehabilitation	Professor Michael Swain	M. Swain, C. He, K. Lyons and D. Purton	Qualitative and quantitative effects of hydrogen peroxide on enamel	Conferred
Smith	Michael	Oral Sciences	Associate Professor Warwick Duncan	W. Duncan, D. Coates, A. Tawse-Smith, J. Leichter and A. Rich	Healing of grafts of Bio-Oss and Moa-Bone in a sheep maxillary sinus model	Conferred

Family Name	Preferred Name	Primary Department	Primary Supervisor	List of All Supervisors	Thesis Title	Status (end 2012)
Suppiah	Praema	Oral Sciences	Associate Professor Mary Cullinan	M. Cullinan, A. Nolan, G. Seymour and W.M. Thomson	Oral health characteristics and oral-health-related quality of life in ankylosing spondylitis patients	Awarded
Tasmania	Robert	Oral Rehabilitation	Professor Robert Love	R. Love and R. Cannon	Contact guidance of endodontic pathogens on micro-grooved polymethylmethacrylate discs	Conferred
Ukra	Ali	Oral Sciences	Professor Mauro Farella	M. Farella, W.M. Thomson, L. Foster Page and B. Knight	Psychosocial and malocclusion characteristics of adolescents	Conferred
Yoganathan	Varayini	Oral Sciences	Professor Robert Love	R. Love and B. Monk	Evaluation of the effects of antimicrobial peptides on endodontic pathogens in vitro	Conferred

Family Name	Preferred Name	Primary Department	Status (end 2012)
<i>Provisional DCLinDent students enrolled in 2011-12</i>			
Allsobrook	Olive	Sir John Walsh Research Institute	Provisional
Atieh	Mo'men	Sir John Walsh Research Institute	Provisional
Beck	Victoria	Oral Sciences	Provisional
Drake	Sarah	Sir John Walsh Research Institute	Provisional
Gibson	Amy	Oral Sciences	Provisional
Gray	Sophie	Oral Sciences	Provisional
Guan	Simon	Dentistry	Provisional
Ibrahim	Hadeel	Oral Rehabilitation	Provisional
Javvadi	Lakshmi	Oral Sciences	Provisional
Kamalendran	Niveathanan	Oral Sciences	Provisional
Khayami	Shahrzad	Oral Sciences	Provisional
Knight	Ellie	Dentistry	Provisional
Knight	Nicholas	Oral Sciences	Provisional
Lam	Doris	Dentistry	Provisional
Lee	Jennifer	Dentistry	Provisional
Lim	Yeen	Oral Rehabilitation	Provisional
Liu	Jenny	Oral Sciences	Provisional
Milmine	Hamish	Oral Sciences	Provisional
Newsham-West	Kathryn	Oral Sciences	Provisional
Ngo	Joanna	Dentistry	Provisional
Park	Stephanie	Oral Sciences	Provisional
Parton	Andrew	Oral Sciences	Provisional
Sajeev	Jeeson	Oral Sciences	Provisional
Subramanian	Jayaram	Oral Sciences	Provisional
Tulloch	Scott	Oral Sciences	Provisional
Yang	Jolin	Dentistry	Provisional

Research Masters completions

RESEARCH MASTERS PROJECTS SUPERVISED WITHIN SJWRI & COMPLETED 2011-12

Master of Community Dentistry; Elizabeth Hitchings – commenced Feb 2010 (part-time); completed November 2012. *The oral health of haemophiliacs: a mixed methods investigation.* (Supervisors: **WM Thomson**, KC Morgaine).

Master of Community Dentistry; Angela Benn – commenced Feb 2010 (part-time); completed August 2012. *Xerostomia among adult New Zealanders.* (Supervisors: **WM Thomson**, JM Broadbent).

Master of Community Dentistry; Victoria McKelvey – commenced Feb 2009 (part-time); completed November 2011. *The use of oral health services by adults with intellectual disability who required a general anaesthetic for dental treatment over a five-year period in Christchurch, and the perceptions of their guardians and support-people relating to their oral health care. A mixed methods study.* (Supervisors: **KC Morgaine**, WM Thomson).

Master of Community Dentistry; Haji Amirul Rizan Bin Haji Mohamed – commenced Feb 2010; completed March 2011. *Epidemiological validation of a Malay Version of the Child Perceptions Questionnaire (CPQ11-14) in Brunei.* (Supervisors: **WM Thomson**, LA Foster Page).

Master of Dental Technology; Shareen Elshiyab – commenced 2010, completed 2011. *The effect of sandblasting on the physical properties of Yttrium stabilised Zirconium Oxide.* (Supervisors: **JN Waddell**, MV Swain).

Master of Health Sciences; Jayaram Subramanian – commenced Feb 2010; completed July 2012. *Student and graduate perceptions of the DClindent programme: a qualitative research project.* (Supervisors: **WM Thomson**, VR Anderson, KC Morgaine).

Master of Health Sciences; Yoganathan Ponnambalam – completed April 2011. *Factors associated with painful apical periodontitis.* (Supervisors: **RM Love**, WM Thomson).



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2010-2011 Summer Studentships

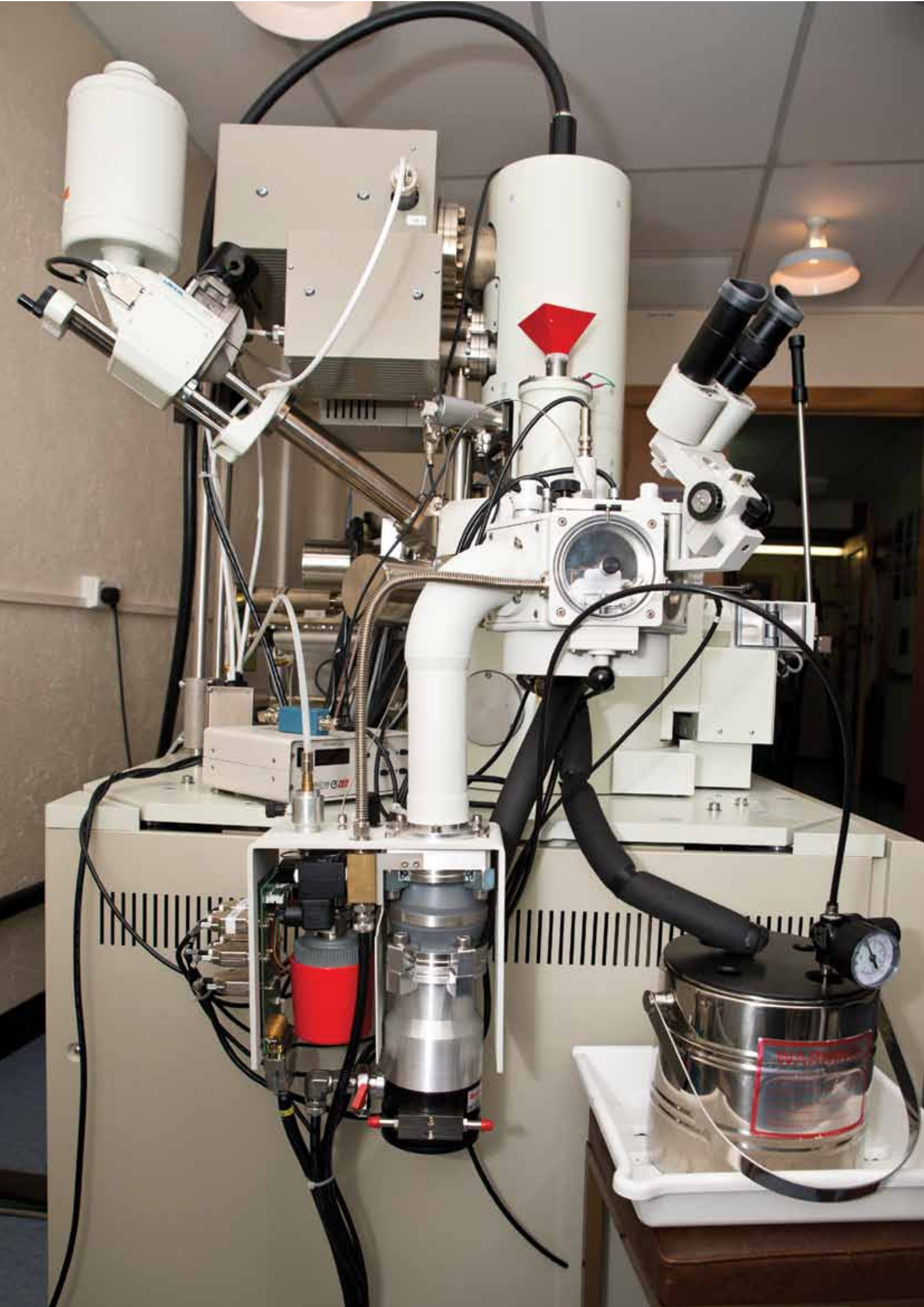
Student	Research project title	Supervisor(s)	Funder/Award
Yulia Artamonova	Finalising the genome sequence of the oral bacterium <i>S. salivarius</i> strain M18	Dr Nicholas Heng	Otago Medical Research Foundation
Joanna Bridson	Towards developing a functional genomics platform for the oral bacterium <i>Streptococcus salivarius</i>	Dr Geoffrey Tompkins, Dr Nicholas Heng	Division of Health Sciences
Madison Chang	Effect of a retraction paste on implant surfaces	Dr Vincent Bennani, Dr Andrew Tawse-Smith	Pierre Rolland-ACTEON France
Rebecca Ellis	Improving surface preparation with ultrasonic instruments: bonding implications	Dr Vincent Bennani, A/P Dave Purton, A/P Nick Chandler	Pierre Rolland-ACTEON France
Rachael Evans	Estimation of age using vertebral shape changes	Prof Jules Kieser; Dr Carl Stephan	Division of Health Sciences
Jacquelyn Fechney	Effect of a novel bleaching technique on tooth shade, microhardness and microstructure	Dr Vincent Bennani, A/P Michael Swain, Dr Florence Bennani, A/P Keith Gordon (Chemistry)	Pierre Rolland-ACTEON France
Joseph Foster	Amplification of streptococcal DNA from ancient dental calculus	Dr Geoffrey Tompkins	Deloitte via the Otago Medical Research Foundation
Marina Kamel	Comparison of silver entities for prevention and management of dental caries	Dr Donald Schwass, Dr Geoffrey Tompkins	Auckland Dental Association
Michelle Kang	The School of Dentistry educational environment and future professional work: Students' perceptions at the start and end of their 2010 first professional year	Dr Lyndie Foster Page, Dr Vivienne Anderson	Division of Health Sciences
Inah Kim	Three dimensional evaluation of jaw growth in rabbits	Dr Warwick Duncan, Prof Mauro Farella	Division of Health Sciences - Health Professions Summer Scholarship
Debra Li	Negative pressure, cavitation effect and swallowing	Prof Jules Kieser, Prof Michael Swain, Dr Chris Bolter (Physiology, OSMS)	Division of Health Sciences
Marija Lovric	Completing the "genomic jigsaw puzzle" of the oral bacterium <i>Streptococcus salivarius</i> strain M18	Dr Nicholas Heng	Division of Health Sciences
Annabel McGettigan	Age estimation from wisdom tooth formation in a New Zealand population	Prof Jules Kieser, Kimberley Timmins, Prof Peter Herbison (Preventive and Social Medicine, DSM)	Division of Health Sciences

Student	Research project title	Supervisor(s)	Funder/Award
Doreen Ng	Neck and shoulder muscle activity during dentistry-related postural tasks	Cameron McNee, Prof Jules Kieser, Prof Mauro Farella	Sir John Walsh Research Institute; New Zealand Dental Research Foundation Board
Lilian Pang	Tracking the study to work transition of oral health graduates	Dr Vivienne Anderson	Division of Health Sciences
Daniel Sundaresan	Identification of friend and foe: Metagenomics of the oral cavity in health and disease	Dr Nicholas Heng, A/P Mary Cullinan	New Zealand Periodontology Society
Yingzhi Xu	The knowledge, attitudes and management of dry mouth by primary health care professionals	A/P Anita Nolan, Suzanne Burns	Division of Health Sciences
Stephen Yu	Improving expression of human multidrug efflux pump Abcb1 in <i>Saccharomyces cerevisiae</i>	Dr M Niimi, Prof Richard Cannon, Dr Erwin Lamping	Sir John Walsh Research Institute; New Zealand Dental Research Foundation Board
Agnes Zhao	The investigation of development and health from birth to six years in children with molar incisor hypomineralisation	Dr Rami Farah, A/P Bernadette Drummond	New Zealand Dental Research Foundation Board

2011-2012 Summer Studentships

Student	Research project title	Supervisor(s)	Funder/Award
Ceridwen Benn	Identifying possums by their oral bacteria	Prof Jules Kieser, Jenine Upritchard, Dr Geoff Tompkins, Dr Nick Heng, Dr James Ross (Lincoln University)	Division of Health Sciences Summer Research Studentship
Katherine Cooper	Effect of a gingival retraction material on titanium implant surface: topography, chemistry and biocompatibility	Dr Vincent Bennani, Dr Andrew Tawse-Smith, Dr Claudine Stirling (Chemistry), Prof George Dias (Anatomy, OSMS)	Pierre Rolland-ACTEON, France
Rebecca Cribben	Effectiveness of a new activated bleaching technique on tooth shade, microhardness and microstructure	Dr Vincent Bennani, Dr Florence Bennani, A/P Keith Gordon (Chemistry)	Pierre Rolland-ACTEON, France
Krystal Fernandes	Why are there so few Māori students studying dentistry?	Prof Alison Rich, Dr Vivienne Anderson Research Studentship	New Zealand Dental Association Summer
Fiona Firth	Immune cells in oral lichen planus	Prof Tom Kardos	Otago Medical Research Foundation
Belinda Hsu	The potential antibacterial activity of chemicals used for gingival retraction, and their interaction with silver nanoparticles	Dr Donald Schwass, Dr Geoff Tompkins	Joint Auckland Dental Association/Division of Health Sciences Summer Research Studentship
Melissa Inger	Comparison of disposable water/air syringe tips versus non-disposable water/air syringe tips	Dr Vincent Bennani, Dr Florence Bennani, Prof Richard Cannon, Prof Mauro Farella	Pierre Rolland-ACTEON, France
Marina Kamel	Outcome of potentially malignant oral mucosal lesions: a 5 year follow up study	A/P Alison Rich	Otago Medical Research Foundation
Lee Rin (Irin) Kang	Final-year BOH and BDS4 students' perceptions of the educational environment. Phase three of a longitudinal study	Dr Vivienne Anderson, Dr Lyndie Foster-Page	Joint New Zealand Dental Association/Division of Health Sciences Summer Research Studentship
Joo-Young Leem	Characterisation of eukaryotic multidrug efflux pumps expressed in the model yeast <i>Saccharomyces cerevisiae</i>	Dr Masakazu Niimi, Dr Kyoko Niimi, Prof Richard Cannon	New Zealand Dental Association Summer Research Studentship
Pamela Pei Sze Ng	Antibacterial activity and substantivity conferred by silver nanoparticles exposed to an electrical field, when acting against bacteria associated with dental caries	Dr Donald Schwass, Dr Geoff Tompkins	Joint Auckland Dental Association/Division of Health Sciences Summer Research Studentship

Student	Research project title	Supervisor(s)	Funder/Award
Rishi Pavaskar	Functional analysis of human multidrug efflux pump ABCB1 in <i>Saccharomyces cerevisiae</i>	Dr Masakazu Niimi, Dr Kyoko Niimi, Prof Richard Cannon	New Zealand Dental Association Summer Research Studentship
Balakrishna Pillai	Fourier analysis of swallowing patterns	Prof Jules Kieser	Division of Health Sciences Summer Research Studentship
Daniel Sundaresan	Metagenomics of the oral cavity in health and disease	Dr Nick Heng, A/P Mary Cullinan	New Zealand Society of Periodontology Summer Research Studentship
Anna Shuhwei Tan	First-year oral health and dentistry student perceptions of future professional work	Dr Vivienne Anderson, Dr Lyndie Foster-Page	New Zealand Dental Association Summer Research Studentship
Naomi Ann Ji-Jiin Ting	A comparison of digital and film radiography in New Zealand dental practices assessed by questionnaire (Student Initiated)	Dr Warwick Duncan, Dr Jonathan Broadbent	Division of Health Sciences Summer Research Studentship
James Yap	Asymmetrical assessment of dental ageing in a Samoan population	Prof Jules Kieser	Division of Health Sciences Summer Research Studentship



Sponsors

The following is a list of organisations, trusts and companies who provided direct financial support for research projects in the Sir John Walsh Research Institute during 2011-12.* Their contributions are greatly appreciated by SJWRI staff and students.

CBG Health Research Ltd
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NZ Ministry of Business, Innovation and Employment
NZ Ministry of Health
Monash University
National Institutes of Health
NZ Dental Association Research Foundation
NZ Lottery Grants Board
Otago Medical Research Foundation
Otago Innovation Ltd
Royal Society of New Zealand (Marsde Fund)
Southern Implants (South Africa)
University of Otago Foundation Trust
University of Otago Research Committee
University of Zurich
Vita Zahnfabrik
Wishbone Trust

*This list does not include sponsors who contributed in-kind support or materials for projects.



Tribute

DR LIHONG (CHRIS) HE

7 September 1978 – 19 November 2012

Chris tragically died in a bicycle accident on the 19th of November 2012.

In 2009, Chris started his lecturing career at The University of Otago and in his few years here he became a popular lecturer amongst his students and a valued research partner and friend to many.

Between 1995 and 2002 he completed his BDS and MDS dental training at West China University of Medical Sciences. He completed his postgraduate DDS training at Sichuan University in 2005, where he specialised in prosthodontics.

He received a scholarship and went to Australia to complete his PhD at the University of Sydney in 2008.

Chris was passionate about his research, and very interested in human enamel. He was one of the first people to report on the influence of the hierarchical microstructure of human enamel on its micro-mechanical properties. His work has been internationally recognised with a citation record of well over 200.

His research interests included the evaluation of nano-mechanical behaviour of dental hard tissues and mechanical evaluation of clinical dental materials from which he published 33 refereed journal articles as well as 3 book chapters between 2005 and 2012.

He spent most of his free time with his young family and enjoyed fishing with his friends. He really appreciated the natural beauty of New Zealand and took every opportunity to experience and explore new places.

His passing is a huge loss to his family, friends and dental community.



Notes



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