

Our people

John M. Aarts

**BEd (WeiTec) BHealSc
DipDentTech DipTertTchg (CIT)
MHealSc PGDipCDTech (Otago)**

Senior Lecturer, Department
of Oral Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=269>

John Aarts has a strong research platform based in removable prosthodontics, with a focus on biomechanical and patient outcomes. His research is focused on innovative developments in dentistry, and the relationship of the biological, mechanical, functional, and aesthetic elements. This research combines a number of different research disciplines from various areas including; clinical dentistry, biomaterials, physics, and biomimetics in dentistry.

Mr Aarts is a founding member of the Biomimetics Research Group, which investigates the materials and techniques used to mimic life. The Biomimetic Research Group has a strong history of publishing and it is currently involved in several collaborative projects with other researchers from within the University of Otago, international universities, and dental profession. Some of the research he has published has been in the areas of dental materials and clinical treatment techniques. His research relating to pressure generated during dental impression techniques is based on a modelling system that he was instrumental in developing. His research interests fit well with his research supervisor role for the Master of Dentistry (with endorsed in aesthetic dentistry) which has seen him supervise a number students through to completion of their Masters research projects during 2019-20.

Key publications 2019-2020

Aarts, J. M., Choi, J. J. E., Metcalfe, S., & Bennani, V. (2020). Influence of build angulation on the mechanical properties of a direct-metal laser-sintered cobalt-chromium used for removable partial denture frameworks. *Journal of Prosthetic Dentistry*. Advance online publication. doi: 10.1016/j.prosdent.2020.06.014

Chai, S. Y., Bennani, V., Aarts, J. M., Lyons, K., & Das, R. (2020). Stress distribution within the ceramic veneer-tooth system with butt joint and feathered edge incisal preparation designs. *Journal of Esthetic & Restorative Dentistry*. Advance online publication. doi: 10.1111/jerd.12655

Chai, S. Y., Bennani, V., Aarts, J. M., Lyons, K., & Lowe, B. (2020). Effect of incisal preparation design on load-to-failure of ceramic veneers. *Journal of Esthetic & Restorative Dentistry*, 32, 424-432. doi: 10.1111/jerd.12584

Chew, D., Bennani, V., Aarts, J. M., Chandler, N., Gray, A., & Lowe, B. (2019). Bonding strengths to porcelain: An in vitro study of ultrasonic and conventional tooth preparation and etching. *Journal of Conservative Dentistry*, 22(1), 76-81. doi: 10.4103/JCD.JCD_302_18

Full publication listings for each staff member are available via their individual profile on the SJWRI website, linked above.

Lee A. Adam

BEd PhD PGDipArts (Otago)

Dental Education Support
Officer, Faculty of Dentistry
Programme Leader, Dental
Education Research



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2027>

Dr Lee Adam's research concentrates on teaching and learning in higher education. Currently much of her research centres on how Dental Students' learning experiences and outcomes can be enhanced. Dr Adam researches students' experiences in higher education in order to inform how policy and practices can be structured to encourage students' retention and success. Dr Adam also researches how teachers teach in order to identify what works and how. This information can be used to inform best teaching practices in higher education.

Dr Adam is currently working on two social anthropological projects, one investigating the use of physical spaces in education, and the other examining academic integrity; how it is understood and enacted. Other research is in the area of Public Health, investigating health professionals' and patients' experiences of treatments.

Dr Adam supervises research students at both undergraduate and postgraduate level. In 2019 she was awarded the Undergraduate Research Supervisor Award by the Sir John Walsh Research Institute. Current supervision projects include research in Public Health, Oral Health, and social anthropology in healthcare. Her research expertise is as a social anthropologist using qualitative research methods.

Dr Adam is the Director of the Education Research Programme of the Sir John Walsh Research Institute. She has international collaborations with other researchers in higher education and clinical education.

Key publications 2019-2020

Adam, L., Oranje, J., Rich, A.M., & Meldrum, A. (2019). Advancing dental education: feedback processes in the clinical learning environment. *Journal of the Royal Society of New Zealand*, i-first. doi: 10.1080/03036758.2019.1656650

Youhanna, K. M. M., Adam, L., Monk, B., & Loch, C. (2020). Dentistry students' experiences, engagement and perception of biochemistry within the dental curriculum and beyond. *European Journal of Dental Education*. Advance online publication. doi: 10.1111/eje.12607

Holden, A. C. L., Adam, L., & Thomson, W. M. (2020). The relationship between professional and commercial obligations in dentistry: A scoping review. *British Dental Journal*, 228(2), 117-122. doi: 10.1038/s41415-020-1195-5

Boyd, D., Zhang, Y., Smith, L., Adam, L., Foster Page, L., & Thomson, W.M. (2020). Caregivers' understanding of informed consent in a randomized control trial. *Journal of Bioethical Inquiry*, i-first. doi: 10.1007/s11673-020-10085-w

M. Azam Ali

MSc(Jahang) PhD(Sci U
Malaysia)

Associate Professor,
Department of Oral
Rehabilitation (from 2021)



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=3407>

Research into biomaterials involves the precise engineering of novel materials including molecularly engineered biomaterials (i.e. engineered therapeutics), fabrication of biomaterials into medical devices, and technology for biomedical applications (human and animal). In addition to having specific physical, mechanical, and biological properties, biomaterials must be biocompatible with healing and tissue regeneration abilities. The research, therefore, encompasses elements of medicine, material science and tissue engineering.

Innovative materials can drive the creation of new products (e.g. medical devices and technology) in many life-science sectors. This makes it a crucial pillar for engineered therapeutics. Thus, the biomaterials and bioengineering team have sound expertise and experiences in multifaceted applied and pure research and commercial sector partnership. Located within the Centre for Bioengineering and Nanomedicine (Dunedin hub), Faculty of Dentistry, Division of Health Sciences, University of Otago, this research focuses on materials / biomaterials (including dental biomaterials), regenerative medicine, stem cells and their relationships with humans.

Research includes:

- Skin and dermal tissue regeneration
- Bone substitutes and bone ceramics
- Dental biomaterials and bone grafts
- Intervertebral Disc (IVD) replacement
- Heart valve leaflet
- Medical gels
- Drug-eluting medical sutures
- Neural tissue regeneration

Key publications 2019-2020

Ali, A., Gould, M., & Lyons, K. (2020). Development of an organic-inorganic nanostructured hybrid dental biocomposite. *Journal of Nanoscience & Nanotechnology*, 20(8), 5252-5259. doi: 10.1166/jnn.2020.18527

Ali, M. A., Rajabi, M., & Sali, S. S. (2020). Additive manufacturing potential for medical devices and technology. *Current Opinion in Chemical Engineering*, 28, 127-133. doi: 10.1016/j.coche.2020.05.001

Ali, A., & Gould, M. (2020). Untapped potentials of hazardous nanoarchitectural biopolymers. *Journal of Hazardous Materials*. Advance online publication. doi: 10.1016/j.jhazmat.2020.124740

Hewitt, E., Mros, S., McConnell, M., Cabral, J. D., & Ali, A. (2019). Melt-electrowriting with novel milk protein/PCL biomaterials for skin regeneration. *Biomedical Materials*, 14, 055013. doi: 10.1088/1748-605X/ab3344

Abdullah Barazanchi

BDS DClinDent (Otago) MRACDS

Lecturer, Department of Oral
Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2600>

Dr Abdullah Barazanchi's research interests primarily revolve around CAD/CAM, dental materials and their behaviour in the oral cavity. His background as a specialist prosthodontist helps relate research outcomes to clinical aspects of dentistry. He completed his doctoral research in 2018 on the topic of milling and 3D printing of cobalt chromium, presenting on the topic nationally and internationally.

Beyond the dental biomaterials and prosthodontics space, Dr Barazanchi has collaborated with other researchers exploring public health aspects of dentistry and the challenges facing disadvantaged communities.

As a newly appointed lecturer in the Faculty of Dentistry he has enjoyed the opportunity to explore his developing interest in research into dental teaching, including a project evaluating inter-professional experience between pharmacy and dental students, as well as the efficacy of various teaching methods.

Key publications 2019-2020

Barazanchi, A., Smith, S. W., Han, J., Reid, T., & Lyons, K. (2020). Uptake and experience of visual magnification and illumination aids by Otago University Bachelor of Dental Surgery students'. *New Zealand Dental Journal*, 116(4), 129-139.

Barazanchi, A., Li, K. C., Al-Amleh, B., Lyons, K., & Waddell, J. N. (2020). Mechanical properties of laser-sintered 3D-printed cobalt chromium and soft-milled cobalt chromium. *Prosthesis*, 2, 313-320. doi: 10.3390/prosthesis2040028

Barazanchi, A., Li, K. C., Al-Amleh, B., Lyons, K., & Waddell, J. N. (2020). Adhesion of porcelain to three-dimensionally printed and soft milled cobalt chromium. *Journal of Prosthodontic Research*, 64, 120-127. doi: 10.1016/j.jpjor.2019.05.007

Hansrani, V. K., Barazanchi, A., Laverty, D., & Brunton, P. (2019). The use of direct resin composite restorations in the management of localized anterior tooth wear: A clinical update part 1. *Dental Update*, 46(8), 708-720. doi: 10.12968/denu.2019.46.8.708

Deanna Beckett

MPH DPH(Otago)
DipDentTher(Wgtn)

Lecturer, Department of Oral
Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=3024>

Deanna Beckett's principal research interests are in the fields of dental public health, dental health promotion, dental enamel defects and vitamin D deficiency, and dental therapy/oral health therapy education.

Ms Beckett is currently involved with a team investigating the dental consequences of vitamin D deficiency during pregnancy and infancy. In 2017 she completed her Master of Public Health degree investigating economic evaluation and oral health related quality of life measures for children. She won the Otago 'Three Minute Thesis' competition at both Divisional and University levels, going on to win the 'people's choice award' at the national competition in Wellington.

Ms Beckett commenced her PhD in July 2018, and is investigating several aspects of intergenerational oral health using data from the Family Health History study, Dunedin Multidisciplinary Health and Disability Study, and the Next Generation Study.

Key publications 2019-2020

Bērziņš, K., Sutton, J. J., Loch, C., Beckett, D., Wheeler, B. J., Drummond, B. K., Fraser-Miller, S. J., & Gordon, K. C. (2019). Application of low-wavenumber Raman spectroscopy to the analysis of human teeth. *Journal of Raman Spectroscopy*, 50, 1375-1387. doi: 10.1002/jrs.5648

Olson, H., Beckett, D. M., Adam, L. A., Tawse-Smith, A., & Moffat, S. M. (2019). Self-perceived stressors of Bachelor of Oral Health students and implications for student support. *Focus on Health Professional Education*, 20(1), 36-49. doi: 10.11157/fohpe.v20i1.313

Vincent Bennani

Quals DDS(Reims) Docteur de
l'Université de Nice Sophia
Antipolis CertAdvPros(Tufts)
CertAdvImpl(Bordeaux)

Associate Professor,
Department of Oral
Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=359>

Associate Professor Bennani has two research themes linking his clinical interests and his biomaterials expertise. His research interests are focused on innovative techniques in dentistry, on new processing techniques such as 3D printing and Biomimetic in dentistry. "Biomimetic" in dentistry means to copy what is life-like. When restoring teeth, the goal is to return the tooth to its original form and function. This research group, co-founded by Associate Professor Bennani, investigates the biomaterials and techniques used to achieve that goal.

In 2019-2020, the team carried out several research projects within the Faculty, including a clinical research, project producing 6 high-quality publications which advanced knowledge within the profession. During this period Associate Professor Bennani further developed his interdisciplinary research with the Departments of Geology, Chemistry, Human Nutrition and Anatomy at the University of Otago, and internationally with the University of Aristotle, University of Thessaloniki (Greece), Tufts University in Boston (USA), Bordeaux University (France) and with the Department of Aerospace and Aviation, Faculty of Engineering, RMIT University, Melbourne, Australia.

Launched in 2017, the Master of Dentistry with endorsement in aesthetic dentistry (MDent) coordinated by Associate Professor Bennani has published multiple research papers in high impact factor international journals. This work highlights the very best clinical, review and research papers in the field of aesthetic dentistry, the most prestigious publication being selected to be published in the newly established "Advances in Aesthetic Dentistry" special issue of the *Journal of Aesthetic and Restorative Dentistry*.

Key publications 2019-2020

Ramani RS, Bennani V, Aarts JM, Choi JJE, Brunton PA. Patient satisfaction with esthetics, phonetics, and function following implant-supported fixed restorative treatment in the esthetic zone: A systematic review. *J Esthet Restor Dent*. 2020; 1- 11. <https://doi.org/10.1111/jerd.12625>

Aarts JM, Choi JJE, Metcalfe S, Bennani V. Influence of build angulation on the mechanical properties of a direct metal-laser sintered Cobalt-Chrome for partial denture frameworks. *J Prosthet Dent*. 2020 Sep 3; S0022- 3913(20)30423-6. doi: 10.1016/j.prosdent.2020.06.014

Bennani V, Aarts JM, Brunton PA. A randomized controlled clinical trial comparing the use of displacement cords and aluminum chloride paste. *J Esthet Restor Dent*. 2020; 32: 410-415. <https://doi.org/10.1111/jerd.12581>

Chai SY, Bennani V, Aarts JM, Lyons K, Lowe B. Effect of incisal preparation design on load-to-failure of ceramic veneers. *J Esthet Restor Dent*. 2020 Jun;32(4):424-432. doi: 10.1111/jerd.12584

Tanmoy Bhattacharjee

BSc MSc (Mumbai) PhD (HBNI)

Postdoctoral Fellow, Sir John
Walsh Research Institute



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2983>

Dr. Bhattacharjee is a postdoctoral fellow on the Topical Ultrasound Contrast Agent for oral cancer screening project led by Professor Warwick Duncan and supported by funding from Lottery Health research grant. He is also part of the team developing the UltraD3 (Ultrasonic Disease Diagnostic Device) for commercial use and is currently conducting clinical trials with the device. His primary interest is in the application of techniques from physics and chemistry fields to biological problems. He has a keen interest in disease screening and diagnosis using spectroscopy and ultrasound, specifically relating to dental disease and cancer diagnostics.

Dr Bhattacharjee has previously worked on spectroscopy-based delineation of protein dynamics, pathogen detection, and evaluation of photodynamic therapy. He also has an interest in developing software and has written MATLAB and R-based scripts for the analysis of large data sets. He is also interested in adapting ultrasound and spectroscopic tools for forensic applications.

Key publications 2019-2020

Sakane KK, Bhattacharjee T, Fagundes J, et al. Biochemical changes in *Leishmania braziliensis* after photodynamic therapy with methylene blue assessed by the Fourier transform infrared spectroscopy. *Lasers in Medical Science*. 2021 Jun;36(4):821-827. doi: 10.1007/s10103-020-03110-2

Paschotto DR, Pupin B, Bhattacharjee TT, Soares LES. Saliva Preparation Method Exploration for ATR-FTIR Spectroscopy: Towards Bio-fluid Based Disease Diagnosis. *Anal Sci*. 2020 Sep 10;36(9):1059-1064. doi: 10.2116/analsci.20P029

Gomes RNS, Bhattacharjee TT, Carvalho LFCS, Soares LES. Adverse effects of respiratory disease medicaments and tooth brushing on teeth: A scanning electron microscopy, X-ray fluorescence and infrared spectroscopy study. *Microsc Res Tech*. 2019 Sep;82(9):1489-1499. doi: 10.1002/jemt.23314

Monteiro da Silva, R., Pupin, B., Bhattacharjee, T. T., Kulcsar, M. A. V., Uno, M., Chammas, R., & de Azevedo Canevari, R. (2020). ATR-FTIR spectroscopy and CDKN1C gene expression in the prediction of lymph nodes metastases in papillary thyroid carcinoma. *Spectrochimica Acta Part A*, 228, 117693. doi: 10.1016/j.saa.2019.117693

Jonathan M. Broadbent

**BDS PhD
PGDipComDent(Otago)**

Associate Professor,
Department of Oral Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=362>

Associate Professor Broadbent conducts research in dental epidemiology and dental public health. His work over the years has had considerable impact in socio-dental epidemiology, health services research and the oral health of older people. His work in the renowned Dunedin Study has contributed to new knowledge on oral conditions, and he successfully completed data collection for the age 45 dental assessments in 2019. His published output includes 89 papers in the peer-reviewed international scientific literature (with 3311 citations), and his Scopus h index is 31. During the 2019-2020 period, he published 16 papers in the peer-reviewed international literature, along with several editorials.

Associate Professor Broadbent is active in supervision of research, and is currently supervising one DCLinDent student (Zeina al Naasan), five PhD students (Angela Benn, Deanna Beckett, Ludwig Jansen van Vuuren, Begoña Ruiz Conrads, Nazahiah Bakri) and two MComDent students (Manisha Narsinh and Tania Stuart).

Since January 2017, he has been the scientific editor of the *New Zealand Dental Journal*, and is now an associate editor for the *Journal of the Royal Society* (since 2019) and *BMC oral health* (since 2020), remains a member of the editorial advisory board for *Community Dentistry and Oral Epidemiology* (since October 2018). He successfully led a special issue of the *Journal of the Royal Society on dental research* (published 2020) and in 2020 he commenced work on a new special issue dedicated to longitudinal research. He is the president of the New Zealand Section of the International Association for Dental Research.

Key publications 2019-2020

Reuben, A., Elliott, M. L., Abraham, W. C., Broadbent, J., Houts, R. M., Ireland, D., Knodt, A. R., Poulton, R., Ramrakha, S., ... Caspi, A., & Moffitt, T. E. (2020). Association of childhood lead exposure with MRI measurements of structural brain integrity in midlife. *JAMA*, 324(19), 1970-1979. doi: 10.1001/jama.2020.19998

Olliver SJ, Broadbent JM, Thomson WM, Farella M. Occlusal Features and TMJ Clicking: A 30-Year Evaluation from a Cohort Study. *Journal of Dental Research*. <https://doi.org/10.1177/0022034520936235> (2020).

Broadbent JM, Murray CM, Schwass DR, Brosnan M, Brunton PA, Lyons KS, Thomson WM. The Dental Amalgam Phasedown in New Zealand: A 20-year Trend. *Operative Dentistry*. doi: 10.2341/19-024-C (2020).

Hong CL, Broadbent JM, Thomson WM, Poulton R. The Dunedin Multidisciplinary Health and Development Study: Oral health findings and their implications. *Journal of the Royal Society of New Zealand*. DOI: 10.1080/03036758.2020.1716816 (2020)

Paul A. Brunton

BChD(Leeds) MSc PhD(Manc)
FDSRCEd FDSRCS FFGDP(UK)

Pro-Vice-Chancellor, Division
of Health Sciences



<https://www.otago.ac.nz/sjwri/people/Profile/?id=1711>

Professor Brunton's research interests are primarily clinical and centred around primary dental care, clinical trials and translational research. Recent projects include modification of restorative filling materials to improve their therapeutic properties and multidisciplinary research with colleagues in diabetes centred around obesity and in needle free local anaesthesia. He has a track record in clinical and translational research having been involved in several multicentre international trials of new technologies, restorative materials and whitening systems primarily working with general dental practitioners. Other ongoing research projects have also included craniofacial research, notably around opening jaw forces and concussive brain injury, and surveys in Oceania focusing on the repair versus replacement of restorations, and dental education in the COVID 19 era.

Professor Brunton collaborates with academics, both in New Zealand, the USA, Europe and the UK. Current collaborations include the Auckland Bioengineering Institute at the University of Auckland in New Zealand, the University of Leeds, Birmingham, University College Cork, Kings College London in the UK, the National University of Athens in Greece and the University of Michigan in the United States of America. He continues to actively collaborate with the Academy of Operative Dentistry and the Faculty of Dental Surgery of the Royal College of Surgeons of England.

In July 2018 Professor Brunton was appointed Pro-Vice-Chancellor of the Division of Health Sciences. He is delighted and honoured to lead the Division which is New Zealand's leading provider of education and research in health and the biomedical sciences.

Key publications 2019-2020

Jum'ah, A. A., Brunton, P. A., Li, K. C., & Waddell, J. N. (2020). Simulated clinical adjustment and intra-oral polishing of two translucent, monolithic zirconia dental ceramics: An in vitro investigation of surface roughness. *Journal of Dentistry*. Advance online publication. doi: 10.1016/j.jdent.2020.103447

Ratnayake, J., Guan, G., Polonowita, A., Li, K. C., Gray, A., Waddell, J. N., Loch, C., & Brunton, P. A. (2020). Can the measurement of jaw-opening forces assist in the diagnosis of temporomandibular disorders? *Journal of Oral & Facial Pain & Headache*, 34(3), 199-205. doi: 10.11607/ofph.2587

Kothari, S., Jum'ah, A. A., Gray, A. R., Lyons, K. M., Yap, M., & Brunton, P. A. (2020). A randomized clinical trial investigating three vital tooth bleaching protocols and associated efficacy, effectiveness and participants' satisfaction. *Journal of Dentistry*, 95, 103322. doi: 10.1016/j.jdent.2020.103322

Kothari, S., Gray, A. R., Lyons, K., Tan, X. W., & Brunton, P. A. (2019). Vital bleaching and oral-health-related quality of life in adults: A systematic review and meta-analysis. *Journal of Dentistry*, 84, 22-29. doi: 10.1016/j.jdent.2019.03.007

Richard D. Cannon

BA PhD(Camb)

Professor, Department of Oral
Sciences

Associate Dean (Research) and
Director SJWRI (to March 2021)



<https://www.otago.ac.nz/sjwri/people/profile/?id=204>

Professor Cannon is a molecular microbiologist who is primarily interested in how microorganisms cause oral diseases and how treatments for patients with these diseases can be improved. His research covers a number of themes, from oral microbial colonization and biofilm formation to the molecular mechanism of drug efflux pumps. 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 group has developed a versatile protein expression system to study these efflux pumps in *Saccharomyces cerevisiae*. He has extended this study to investigate the anthelmintic resistance of parasitic nematodes that infect livestock. Other research is using on-body wireless probes to monitor facial muscle contractions, investigating the genetic basis of malocclusion, and studying the formation, and removal, of oral biofilms.

Professor Cannon collaborates with several national and international groups to investigate efflux-mediated fungal drug resistance. He is working with Associate Professor Alok Mitra (University of Auckland) on a project to obtain structural insights into *Candida albicans* efflux pump Cdr1. He is also collaborating with Professor Susumu Kajiwara (Tokyo Institute of Technology), Dr Ariya Chindamporn (Chulalongkorn University, Bangkok) and Associate Professor Jacinta Santhanam (National University of Malaysia) to study drug efflux pumps from the important fungi *C. utilis*, *Penicillium marneffei*, and *Fusarium solani* species complex. Professor Cannon has developed a collaboration with several researchers at the Chongqing Medical University Stomatological Hospital, and has been made an Honorary Professor at that institution. His DClinDent candidate Nurul Thiyahuddin graduated in 2019, and his PhD candidate Golnoush Madani in 2020.

Key publications 2019-2020

James, J. E., Lamping, E., Santhanam, J., Milne, T. J., Razak, M. F. A., Zakaria, L., & Cannon, R. D. (2020). A 23 bp cyp51A promoter deletion associated with voriconazole resistance in clinical and environmental isolates of *Neocosmospora keratoplastica*. *Frontiers in Microbiology*, 11, 272. doi: 10.3389/fmicb.2020.00272

Jiang, Q., Mei, L., Zou, Y., Ding, Q., Cannon, R. D., Chen, H., & Li, H. (2019). Genetic polymorphisms in FGFR2 underlie skeletal malocclusion. *Journal of Dental Research*, 98(12), 1340-1347. doi: 10.1177/0022034519872951

Han, T.-L., Cannon, R. D., Gallo, S. M., & Villas-Bôas, S. G. (2019). A metabolomic study of the effect of *Candida albicans* glutamate dehydrogenase deletion on growth and morphogenesis. *npj Biofilms & Microbiomes*, 5, 13. doi: 10.1038/s41522-019-0086-5

Mohd Thiyahuddin, N., Lamping, E., Rich, A. M., & Cannon, R. D. (2019). Yeast species in the oral cavities of older people: A comparison between people living in their own homes and those in rest homes. *Journal of Fungi*, 5(2), 30. doi: 10.3390/jof5020030

Peter R. Cathro

MDS PGCertTertT(Otago)
PhD(Adel)

Senior Lecturer and Head of
Department, Department of
Oral Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2216>

Dr Cathro's research underpins both endodontic (root canal) practice and clinical teaching. His PhD thesis was entitled Proteomic analysis of *Enterococcus faecalis* cell membrane proteins under high alkaline stress conditions. A seminal finding has been the identification of up and down-regulated proteins which now forms the basis of on-going investigations as a PhD project.

A current trend in Endodontics is the use of a more biological approach for the management of roots that have not fully developed due to infection, termed revitalisation. In order to facilitate research in this field, a suitable animal model is required. Dr Cathro proposed the use of sheep as a suitable model and this has formed the basis of a PhD which he co-supervised with three resulting publications.

The bleaching of stained teeth requires the use of toxic materials. Dr Cathro has been a supervisor in two DCLinDent projects investigating the efficacy and safety of bleaching protocols.

Key publications 2019-2020

Ratnayake, J. T., Ross, E. D., Dias, G. J., Shanafelt, K. M., Taylor, S. S., Gould, M. L., Guan, G., & Cathro, P. R. (2020). Preparation, characterisation and in-vitro biocompatibility study of a bone graft developed from waste bovine teeth for bone regeneration. *Materials Today Communications*, 22, 100732. doi: 10.1016/j.mtcomm.2019.100732

Scott, N., Thomson, W. M., & Cathro, P. R. (2020). Traumatic dental injuries among New Zealanders: Findings from a national oral health survey. *Dental Traumatology*, 36, 25-32. doi: 10.1111/edt.12505

Smith, A., Scott, I., Ratnayake, J., Newsham-West, K., & Cathro, P. (2019). An intervention study: Does a cognitive reappraisal technique reduce the perceived stress in fourth-year dental students in New Zealand? *International Journal of Dentistry*, 2019, 5864591. doi: 10.1155/2019/5864591

Loch, C., Ratnayake, J., Veerasamy, A., Cathro, P., Lee, R., & Brunton, P. A. (2019). Direct restorations, endodontics, and bleaching: Materials and techniques used by general dentists of New Zealand. *International Journal of Dentistry*, 2019, 6327171. doi: 10.1155/2019/6327171

Jung Eun (Joanne) Choi

BDentTech(Hons) PhD(Otago)

Senior Lecturer, Department
of Oral Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2302>

Dr Choi carries out qualitative and quantitative analysis of the mechanical properties and failure mechanisms of various restorative dental materials (dental resins, metals and ceramics, and CAD-CAM and 3D printed dental materials). She also conducts research into developing new dental restorative materials to improve oral care and real-time measuring systems to evaluate physiologic changes (e.g. intraoral pH and temperature, temperature changes in restorative materials) or biomechanics of the materials in the oral cavity (e.g. pressure from dentures and other oral appliances). For her PhD, Dr Choi developed and validated a wired sensor system to monitor intraoral pH and temperature for long-term periods, the results of which can be used in identifying and evaluating causal factors involved with dental wear. She is part of the Biomechanics and Oral Implantology and Craniofacial Research programmes of the Sir John Walsh Research Institute.

In 2019-2020 Dr Choi was awarded \$79,975 in competitive research funding as Principal Investigator from funding bodies including the NZ Dental Research Foundation, Cure Kids, the Maurice and Phyllis Paykel Trust and the University of Otago. She was awarded the 2019 Joan Chong Award in Dental Materials from the International Association of Dental Research (ANZ Division), the 2019 SJWRI Strategic Research Prize, and the 2020 SJWRI Publication Award and Undergraduate Research Supervisor Award. Her BDentTech(Honours) student Ana Grymak won the IADR Colgate NZ Poster Competition Junior category in 2020, for the study "Polishability of Occlusal Splint Material by Various Manufacturing Methods". She was 3rd placegetter in the Australia/New Zealand Divisional poster competition.

Key publications 2019-2020

Aarts J, Choi JJE, Bennani V, Metcalfe C (2020). The influence of build angulation on the mechanical properties of a direct-metal laser-sintered cobalt-chrome used for removable partial denture frameworks. *Journal of Prosthetic Dentistry*. 20:30423-6. doi: 10.1016/j.prosdent.2020.06.014.

Choi JJE, Uy CE, Ramani RS, Waddell JN (2020). Evaluation of surface roughness, hardness and elastic modulus of nanoparticle containing light-polymerized denture glaze materials. *Journal of the Mechanical Behaviour of Biomedical Materials*. 103:103601

Tykhonova LY, Dias M, Zhou LD, Richardson C, Waddell JN, Choi JJE (2020). The efficacy of a novel temporary crown system marginal seal and structural durability in terms of cyclic loading – a pilot study. *Dental Oral Biology and Craniofacial Research*. 10.31487.

Choi JJE, Uy CE, Plaksina P, Ramani RS, Ganjigatti R, Waddell JN (2019). Bond strength of denture teeth to heat-cured, CAD/CAM and 3D printed denture acrylics. *Journal of Prosthodontics*.

Angela Clark

**BSc(Hons)(C Lancs) MSc(Brad)
PhD(Otago)**

Lecturer, Sir John Walsh
Research Institute



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2348>

Dr Angela Clark was appointed within the SJWRI as a 0.6 FTE confirmation path Lecturer in mid-2019. As an expert forensic anthropologist, Angela's research integrates a bioarchaeological approach to forensic science acknowledging that human beings are both sociocultural and biological beings – te tapu o te Tangata. Her area of research interests are reading the signs of trauma, disease, and stress on the bones and teeth, figuring out how those markers relate to understanding the circumstances around an individuals' death, and how these may also assist formal identification procedures through uncovering who they were during life.

Dr Clark is striving to pursue research excellence within the underdeveloped field of forensic science at the University of Otago, and building strong research collaborations with Crown Forensic Science Provider, ESR. Dr Clark advises pathologists, New Zealand Police, and lawyers when human remains are found, writes expert reports, and provides evidence to courts in New Zealand. In 2019, Angela had the honour to work with Te Runanga o Kaikōura and North Canterbury Transport Infrastructure Recovery (NCTIR), Kaikōura on the repatriation of kōiwi tangata during the rebuilding of SH1. Her professional experience fuels important real-world research questions, including potential biological, psychological, legal, sociocultural and ethical considerations of the presentation of 3D model replicas and digitisations of human skeletal remains (kōiwi tangata) in a criminal courtroom.

In 2020, Dr Clark supervised a dental elective student who examined the History of Forensic Odontology in Aotearoa New Zealand from a mātauranga Māori perspective. This research found that except for some forensic anthropological casework, formal methods for forensic human identification often did not consider tikanga Māori and initiate the process from a kaupapa Māori approach.

Key publications 2019-2020

Clark A.L, Stantist, C, Buckley H.R, and Tayles, N. (2020) Oral health of the prehistoric Rima Rau cave burials, Atiu, Cook Islands. *Journal of the Royal Society of New Zealand*, 50:1, 158-177

Dawn E. Coates

BSc PhD(Otago)

Research Associate Professor,
Sir John Walsh Research
Institute



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=529>

Dr Coates undertakes research into the cellular and molecular mechanisms involved in tissue growth and remodeling in relation to health and disease with a strong focus on regeneration within the oral cavity. She has particular expertise in the processes of osteogenesis and angiogenesis. Stem cell research continues to be a major focus with projects investigating adipose, periosteum and dental pulp stem cells for tissue regeneration. She also conducts research using proteomics to elucidate the key pathways and mechanisms involved in deer antler renewal, as the only model of stem cells driven mammalian organ regeneration. Dr Coates is currently developing her stem cell research platform to encompass the field of 3D bioprinting. Other areas of research include: ER stress and the unfolded protein response, oral squamous cell carcinoma, and development of bone graft materials.

During the period 2019-2020, Dr Coates published 8 papers in peer-reviewed journals and 17 abstracts. She received 5 new grants with \$136k of funding. Postgraduate students received notable awards including the Sir John Walsh Postgraduate Research Publication award, poster/presentation awards, travel awards, and a scholarship to undertake collaborative research in Switzerland. Dr Coates has judged research competitions, served on an expert panel, reviewed theses and leads multiple projects. She also has oversight of the dental tissue culture facility. In 2019 Dr Coates won an EVOS microscope for her research, was an invited speaker at the Queenstown Research week, and delivered talks and seminars within the Dental Faculty. She supervised 2 PhD and 4 DCLinDent completions, and has 4 current PhD students. Key collaborations include: Key State Lab in Changchun, China; University of Malaya; CReaTE research group, University of Otago; University of Queensland Dental Faculty; Prof Cornish, University of Auckland; Prof Bostanci, Karolinska Institutet, Sweden.

Key publications 2019-2020

Dong, Z., Li, C., & Coates, D. (2020). PTN-PTPRZ signalling is involved in deer antler stem cell regulation during tissue regeneration. *Journal of Cellular Physiology*. Advance online publication. doi: 10.1002/jcp.30115.

Dong, Z., Haines, S., & Coates, D. (2020). Proteomic profiling of stem cell tissues during regeneration of deer antler: A model of mammalian organ regeneration. *Journal of Proteome Research*, 19, 1760-1775. doi: 10.1021/acs.jproteome.0c00026.

Cotton, G. C., Gee, C., Jude, A., Duncan, W. J., Abdelmoneim, D., & Coates, D. (2019). Efficacy and safety of alpha lipoic acid-capped silver nanoparticles for oral applications. *RSC Advances*, 9(12), 6973-6985. doi: 10.1039/c9ra00613c.

Dong, Z., Coates, D., Liu, Q., Sun, H., & Li, C. (2019). Quantitative proteomic analysis of deer antler stem cells as a model of mammalian organ regeneration. *Journal of Proteomics*, 195, 98-113. doi: 10.1016/j.jprot.2019.01.004.

Paul R. Cooper

BSc(Hons)(Leeds) PhD
PGCILTHE (Birm) MRSNZ

Professor, Department of
Oral Sciences



<https://www.otago.ac.nz/sjwri/people/profile/?id=3228>

Professor Cooper's research is broad ranging within the field of oral and dental tissue inflammation and repair. He has over 20 years experience in oral and dental research, he has over 160 full publications and has an h-index of 53. In 2019-2020 his outputs were 20 full publications and one book chapter. He has multiple research collaborations around the world including with colleagues at Universities in Japan, US, Italy, Ireland and the UK. Over 2019-2020 he served as the vice-president, president and past-president of the Pulp Biology and Regeneration Group of the IADR. He is on the Editorial Board of several leading dental journals including Journal of Dental Research, Journal of Periodontal Research, Journal of Endodontics, Journal of Dentistry, Dentistry Journal, Frontiers in Dental Medicine (Section Editor - Endodontics). His particular research interests include:

- *Dentine-pulp complex biology* – study of the molecular changes which occur in the dentine-pulp complex as a result of dental disease & injury, stem cell responses & tissue regeneration, and in responses to dental materials.
- *Oral epithelial and neutrophil responses* – studies in oral inflammatory diseases, including caries and periodontal diseases, in response to oral pathogens, and the potential role of Neutrophil Extracellular Traps and epithelial-mesenchymal transition in disease pathogenesis.
- *Low Level Light/Laser Therapy, photobiomodulation/phototherapy* - exploring the utility of phototherapies in promoting oral and dental tissue health as well as for disinfection.
- *Tribology of tooth cleaning* - industry funded studies have utilised profilometry, gloss analyses, stain models and SEM to investigate mechanistic actions of toothpaste for oral hygiene.

Key publications 2019-2020

Aral, K., Milward, M. R., & Cooper, P. R. (2020). Dysregulation of inflammasomes in human dental pulp cells exposed to *Porphyromonas gingivalis* and *Fusobacterium nucleatum*. *Journal of Endodontics*, 46(9), 1265-1272. doi: 10.1016/j.joen.2020.06.008

Arruda-Vasconcelos, R., Louzada, L. M., Feres, M., Tomson, P. L., Cooper, P. R., & Gomes, B. P. F. A. (2020). Investigation of microbial profile, levels of endotoxin and lipoteichoic acid in teeth with symptomatic irreversible pulpitis: a clinical study. *International Endodontic Journal*. Advance online publication. doi: 10.1111/iej.13402

Holder, M. J., Wright, H. J., Couve, E., Milward, M. R., & Cooper, P. R. (2019). Neutrophil extracellular traps exert potential cytotoxic and proinflammatory effects in the dental pulp. *Journal of Endodontics*, 45(5), 513-520.e3. doi: 10.1016/j.joen.2019.02.014

Koutroulis, A., Kuehne, S. A., Cooper, P. R., & Camilleri, J. (2019). The role of calcium ion release on biocompatibility and antimicrobial properties of hydraulic cements. *Scientific Reports*, 9, 19019. doi: 10.1038/s41598-019-55288-3

Harsha L. De Silva

BDS(S Lanka) MS(Colombo)
DClinDent(Otago) FDSRCS
FFDRCS

Senior Lecturer, Department
of Oral Diagnostic and
Surgical Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=621>

Harsha De Silva's research interests include the clinicopathological behaviour of oral potentially malignant disorders, post-operative outcomes of third molar surgery and contemporary surgical practice trends in general dental practice. Ongoing research collaborations with the University of Sri Jayewardanapura, Sri Lanka focuses on molecular markers in oral carcinogenesis. Progress has been hampered by the disturbances due to the Covid-19 pandemic and will hopefully gather momentum shortly.

His second area of research interest focuses on trends in general dental practice to investigate how general dental practitioners perceive and apply current evidence in the surgical management of dental patients with complex medical needs. This has been further developed to formulate clinical trials to facilitate graduate research for Clinical Doctorate students in the discipline of oral surgery on "improvements of third molar surgery outcomes". This developing research platform has received support from the New Zealand Dental Association Research Foundation.

Key publications 2019-2020

Won J, De Silva HL, De Silva RK, & Colambage S. (2020) An unusual lingual lesion: Actinomycosis of the tongue. *Oral Surgery*, 13(1), 33-36. doi:10.1111/ors.12437

Won J, De Silva HL, & De Silva RK. (2020). A diagnostic dilemma: An unusually large osteochondroma of the mandibular condyle and temporomandibular dysfunction. *Oral Surgery*, 13, 164-167. doi: 10.1111/ors.12471

Edirisinghe, S., Yasewardene, S., Weerasekera, M., Rich, A., De Silva, H., Milne, T., Hussaini, H., ... Gunasinghe, R. (2020). Association of smoking and level of expression of vascular endothelial growth factor (VEGF) gene with oral squamous cell carcinoma. *Journal of Anatomy*, 236(Suppl. 1), P1-CM12. doi: 10.1111/joa.13163

Lamb AW, Hong CL, De Silva HL, Thomson WM, & Broadbent J M. (2019). New Zealand oral health practitioners' cross-infection control practices. *New Zealand Dental Journal*, 115(1), 5-10

Rohana K. De Silva

BDS(S Lanka) FDSRCP(S Glas)
FFDRCSI FDSRCS

Associate Professor,
Department of Oral Diagnostic
and Surgical Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=213>

Associate Professor Rohana Kumara De Silva performs research to identify methods to improve the quality of life in patients with dental and oral health related problems, in particular minimising complications and providing effective pain management following oral surgery procedures. He has also continued a collaboration with collaborators in Sri Lanka which began in 2015 in oral squamous cell carcinoma (OSCC), in order to help surgeons identify the best surgical procedure for the patients of oral squamous cell carcinoma with clinically negative neck nodes, and minimise unnecessary surgical procedures. His group is planning to further investigate by incorporating the data from 2016 to 2020 in Sri Lanka, as well as incorporating data from Malaysia. He recently published a review article in a high impact journal on “Oral epithelial dysplasia: causes, quantification, prognosis and management challenges” which, since oral epithelial dysplasia is a potentially malignant condition, will educate clinicians in the management of these lesions more effectively.

He was principal supervisor for the DClinDent research project of Adelyn Lau, who won the senior category of the 2019 Colgate New Zealand IADR poster competition, and finished first runner-up in the 2019 Australia/New Zealand Divisional competition at the IADR APR meeting in Brisbane, November 2019. This earned her an opportunity and a travel grant to present at the IADR General Session in Washington DC in 2020 (unfortunately cancelled due to COVID). He also co-supervised recent DClinDent graduates Oripa Waqa (completed 2019), Jessica Lee (completed 2020), and current DClinDent in Oral Surgery candidates Jesslyn Praganta and Nigel Tan.

Key publications 2019-2020

Won, J., De Silva, H. L., & De Silva, R. K. (2020). A diagnostic dilemma: An unusually large osteochondroma of the mandibular condyle and temporomandibular dysfunction. *Oral Surgery*, 13, 164-167. doi: 10.1111/ors.12471

Won, J., De Silva, H. L., De Silva, R. K., & Colabage, S. (2020). An unusual lingual lesion: Actinomycosis of the tongue. *Oral Surgery*, 13(1), 33-36. doi: 10.1111/ors.12437

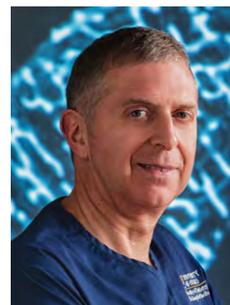
Naung, N. Y., Duncan, W., De Silva, R., & Coates, D. (2019). Localization and characterization of human palatal periosteum stem cells in serum-free, xeno-free medium for clinical use. *European Journal of Oral Sciences*, 127, 99-111. doi: 10.1111/eos.12603

Tilakaratne, W. M., Jayasooriya, P. R., Jayasuriya, N. S., & De Silva, R. K. (2019). Oral epithelial dysplasia: Causes, quantification, prognosis, and management challenges. *Periodontology 2000*, 80(1), 126-147. doi: 10.1111/prd.12259

Warwick J. Duncan

ED MDS PhD(Otago) FRACDS FICD
MRSNZ

Professor, Department of Oral
Sciences
Programme Leader, Clinical
and Translational Research
Director SJWRI (March 2021-)



<https://www.otago.ac.nz/sjwri/people/profile/?id=198>

Professor Duncan's primary research involves Periodontology and Dental Implantology. He conducts clinical testing of dental implants and periodontal treatment approaches in human clinical trials, and is active in preclinical testing using animal models. Professor Duncan's personal expertise includes clinical periodontics, implant surgery, hard-tissue histomorphometry, and leading multi-disciplinary research teams. He leads the regional team for forensic dental victim identification and is active in forensic research. He is also Regimental Colonel of the Royal New Zealand Dental Corps and has published research in military medicine. He has active collaborations with researchers in Switzerland, Malaysia and Korea, and in New Zealand with Callaghan Innovation and the Department of Medicine in the University of Auckland. He has conducted commercial research for many international dental implant companies and producers of maxillofacial grafting products and has active collaborations with several NZ biotech firms. At Otago, Professor Duncan collaborates with the Departments of Anatomy and Chemistry, Christchurch Regenerative Medicine and Tissue Engineering (CReaTE) research group and with his colleagues in the SJWRI. Current research includes:

- Regeneration of bone to support titanium implants with different modified surfaces
- Novel bone grafting materials - biomechanical, *in vitro* and *in vivo* analyses
- Ultrasound diagnosis of periodontal and peri-implant diseases
- Adjunctive chemotherapeutics for treatment of periodontitis and peri-implantitis

Key publications 2019-2020

Jansen van Vuuren, L., Jansen van Vuuren, W. A., Broadbent, J. M., Duncan, W. J., & Waddell, J. N. (2020). Development of a bite force transducer for measuring maximum voluntary bite forces between individual opposing tooth surfaces. *Journal of the Mechanical Behavior of Biomedical Materials*, 109, 103846. doi: 10.1016/j.jmbbm.2020.103846

Sheftel, Y., Ruddiman, F., Schmidlin, P., & Duncan, W. (2020). Biphasic calcium phosphate and polymer-coated bovine bone matrix for sinus grafting in an animal model. *Journal of Biomedical Materials Research Part B*, 108B, 750-759. doi: 10.1002/jbm.b.34429

Cotton, G. C., Gee, C., Jude, A., Duncan, W. J., Abdelmoneim, D., & Coates, D. (2019). Efficacy and safety of alpha lipoic acid-capped silver nanoparticles for oral applications. *RSC Advances*, 9(12), 6973-6985. doi: 10.1039/c9ra00613c

Ma, S., Tawse-Smith, A., Brown, S. D. K., & Duncan, W. (2019). Immediately restored single implants in the aesthetic zone of the maxilla using a novel design: 5-year results from a prospective single-arm clinical trial. *Clinical Implant Dentistry & Related Research*, 21, 344-351. doi: 10.1111/cid.12733

Manikandan Ekambaram

**BDS(Dr MGR) MDS PhD(HK)
FDSRCSEd MPaedDent(RSCed)
MRACDS**

Associate Professor,
Department of Oral Sciences



<https://www.otago.ac.nz/sjwri/people/profile/?id=2873>

Associate Professor Ekambaram's research focuses on strategies to manage early enamel caries lesions, enhancement of enamel and dentine adhesion with focus on adhesion to developmentally hypomineralised enamel. He also has a special interest in paediatric oral health which aligns well with his clinical specialty.

Through his research, he has established a niche in experimental strategies for enhancing dentine bond durability, enhancing bonding to developmentally hypomineralised enamel, studying the remineralisation potential of various contemporary remineralisation agents on early enamel carious lesions. Additionally, his ongoing research projects are aiming at other novel experimental strategies to remineralise such lesions.

Since his appointment at the University of Otago Faculty of Dentistry in 2018, Associate Professor Ekambaram has published 28 research articles in peer review journals, and received research funding as either principal or co-investigator of a total value of \$473,868 NZD. He has supervised six postgraduate research theses to completion. His key collaborators include colleagues from Faculty of Dentistry, The University of Hong Kong and the UWA Dental School, The University of Western Australia.

Key publications 2019-2020

Bijle, M. N., Ekambaram, M., Lo, E. C. M., & Yiu, C. K. Y. (2020). Antibacterial and mechanical properties of arginine-containing glass ionomer cements. *Dental Materials*, 36, 1226-1240. doi: 10.1016/j.dental.2020.05.012

Bijle, M. N., Ekambaram, M., Lo, E. C. M., & Yiu, C. K. Y. (2020). The enamel remineralization potential of fluoride varnishes containing arginine. *Journal of Dentistry*, 99, 103411. doi: 10.1016/j.jdent.2020.103411

Uy, E., Ekambaram, M., Lee, G. H. M., & Yiu, C. K. Y. (2019). Remineralization potential of calcium and phosphate-based agents and their effects on bonding of orthodontic brackets. *Journal of Adhesive Dentistry*, 21(3), 219-228. doi: 10.3290/j.jad.a42305

Lam PPY, Sardana D, Ekambaram M, Lee GHM, Yiu CKY. Effectiveness of Pit and Fissure Sealants for Preventing and Arresting Occlusal Caries in Primary Molars: A Systematic Review and Meta-Analysis. *J Evid Based Dent Pract*. 2020 Jun;20(2):101404. doi: 10.1016/j.jebdp.2020.101404

Mauro Farella

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

Professor, Department of Oral
Sciences

Programme Leader,
Craniofacial Research



<https://www.otago.ac.nz/sjwri/people/profile/?id=530>

Professor Farella's research interests include clinical trials in orthodontics, biomechanics of tooth movements, normal and abnormal craniofacial growth, and translational craniofacial research using animal models. He is a widely recognized expert in jaw function, pathophysiology of orofacial muscles, bruxism, and long-term monitoring of masticatory muscle activity.

In 2018-20, Professor Farella has published 18 full-length articles, and obtained 8 grants from various funding bodies, including Cure Kids, NZDA, Colgate, and NZAO. He has been acting as main supervisor or co-supervisor of two PhD projects, eighteen DCLinDent projects, and one Honours projects.

He is Associated Editor of the Journal Orthodontics and Craniofacial Research and on the Editorial Board of the Journal of Oral Rehabilitation. Professor Farella has served the Management Committee of the New Zealand Consortium for Medical Devices Technologies (MedTech Core). He is also member of the Centre for Bioengineering, of the Neuroscience Programme, of Pain@Otago, and of Genetics Otago.

Key publications 2019-2020

Al-Ani, A. H., Antoun, J. S., Thomson, W. M., Merriman, T. R., & Farella, M. (2020). Common variants of EDA are associated with non-syndromic hypodontia. *Orthodontics & Craniofacial Research*. Advance online publication. doi: 10.1111/ocr.12419

Idris, G., Smith, C., Galland, B., Taylor, R., Robertson, C. J., Bennani, H., & Farella, M. (2020). Relationship between chewing features and body mass index in young adolescents. *Pediatric Obesity*. Advance online publication. doi: 10.1111/ijpo.12743

Olliver, S. J., Broadbent, J. M., Thomson, W. M., & Farella, M. (2020). Occlusal features and TMJ clicking: A 30-Year evaluation from a cohort study. *Journal of Dental Research*, 99(11), 1245-1251. doi: 10.1177/0022034520936235

Prasad, S., Paulin, M., Cannon, R. D., Palla, S., & Farella, M. (2019). Smartphone-assisted monitoring of masticatory muscle activity in freely moving individuals. *Clinical Oral Investigations*, 23, 3601-3611. doi: 10.1007/s00784-018-2785-3

Fiona A. Firth

**BDS DCLinDent(Otago) FRACDS
MOrth RCSEd MRACDS(Orth)**

Senior Lecturer, Department
of Oral Sciences



<https://www.otago.ac.nz/sjwri/people/expertise/profile/?id=3250>

Dr Firth's research activities interests lie in the biology of tooth movement and craniofacial biology. She has a particular interest in the use of tissue culture models to investigate orthodontic movement.

Dr Firth was heavily involved with the development of a mechanical strain model for the assessment of periodontal ligament cell endoplasmic reticulum stress in three-dimensional culture. Her ongoing research is continuing to develop and expand tissue culture models for orthodontic tooth movement research.

Dr Firth is interested in a wide variety of other research areas, including clinical research, craniofacial growth and development and clinical genetics. Fiona is overseeing the ongoing collection of genetic samples from orthodontic patients with specific phenotypes such as hypodontia or oligodontia. She was a co-recipient of NZDRF grants in both 2019 and 2020. She was also Principal Investigator on a successful Lottery Health Research equipment grant application in 2020, which awarded \$124,121 towards the purchase of an optical profiler that will allow quantitative measurements of 3D form and surface roughness.

Key publications 2019-2020

Firth, F. A., Milne, T. J., Seo, B., & Farella, M. (2020). An in-vitro mechanical strain three-dimensional culture model: Periodontal ligament cell viability, apoptosis, and endoplasmic reticulum stress response. *European Journal of Oral Sciences*, 128, 120-127. doi: 10.1111/eos.12681

Firth, F. A., Farrar, R., & Farella, M. (2020). Investigating orthodontic tooth movement: Challenges and future directions. *Journal of the Royal Society of New Zealand*, 50(1), 67-79. doi: 10.1080/03036758.2019.1684957

Lee, S., Firth, F. A., Bennani, F., Harding, W., Farella, M., & Antoun, J. S. (2019). Evaluation of objective and subjective treatment outcomes in orthodontic cases treated with extraction of a mandibular incisor. *Angle Orthodontist*, 89(6), 862-867. doi: 10.2319/011018-25.1

Hodgkinson, D., Firth, F. A., & Farella, M. (2019). Effect of incisor retraction on facial aesthetics. *Journal of Orthodontics*, 46(1, Suppl.), 49-53. doi: 10.1177/1465312519840031

Lara T. Friedlander

MDS PhD(Otago) FRACDS

Associate Dean
(Undergraduate Studies)
(from Feb 2021)

Associate Professor,
Department of Oral Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/?id=442>

Associate Professor Friedlander is a researcher within the Oral Molecular & Immunopathology, Clinical, and Dental Education Research Groups. Her predominant area of interest is in endodontics encompassing pulpal biology, bioengineering and regeneration, clinical translational research and curriculum development. Associate Professor Friedlander is an active researcher in ARCH (Applied Research through Clinicians Hands), NZ's first dental practice-based research network (PBRN). PBRNs answer clinical questions and deliver research-led findings which are relevant NZ healthcare. She has been a co-investigator of substantial external HRC, UORG and NZDRF Grant funding to advance research in bioengineering and dental pulp regeneration. Dr Friedlander supervises PhD, Clinical Doctorate and BDS students and collaborates with programme leads from international universities to expand these research platforms.

Local collaborators in 2019-20 have included Professor Alison Rich, Dr Trudy Milne, Associate Professor Haizal Hussaini, Dr Shaikhah AlSamahi, Professor Nick Chandler, Ms Lucy Prendergast, Ms Gabrielle Hunt, Dr Finn Gilroy, Dr Payman Hamadani, Ms Shelly Arora, Dr Ben Seo, and Dr Shakila Rizwan (Pharmacy), Associate Professor Ben Daniel (HEDC). Dr Friedlander has numerous international collaborations in pulp biology and education which have resulted in publications. Clinical collaborations have occurred around practice based research with the ARCH network and national collaborations have been made with interested general practitioners who have engaged with New Zealand's first dental PBRN.

Key publications 2019-2020

Rossi-Fedele, G., Damiani, F., Love, R. M., George, R., Parashos, P., Wu, M. C.-Y., Friedlander, L., ... Abbott, P. V. (2020). Revised guidelines for educational requirements for specialisation in endodontics in Australia and New Zealand (July 2020). *Australian Endodontic Journal*. Advance online publication. doi: 10.1111/aej.12431

Coates, D. E., Alansary, M., Friedlander, L., Zanocotti, D. G., & Duncan, W. J. (2020). Dental pulp stem cells in serum-free medium for regenerative medicine. *Journal of the Royal Society of New Zealand*, 50(1), 80-90. doi: 10.1080/03036758.2019.1673447

Friedlander, L. T., Meldrum, A. M., & Lyons, K. (2019). Curriculum development in final year dentistry to enhance competency and professionalism for contemporary general dental practice. *European Journal of Dental Education*, 23, 489-506. doi: 10.1111/eje.12458

Al-Hassiny, A., Hussaini, H., Milne, T., Seo, B., Rich, A. M., & Friedlander, L. T. (2019). Vascularity and angiogenic signaling in the dentine-pulp complex of immature and mature permanent teeth. *European Endodontic Journal*, 4(2), 80-85. doi: 10.14744/ej.2019.26349

Guangzhao (Simon) Guan

BDS MB ChB DClinDent(Otago)

Senior Lecturer, Department
of Oral Diagnostic and
Surgical Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2872>

Dr Simon Guan is currently a senior lecturer and specialist consultant in Oral Medicine at the Faculty of Dentistry, University of Otago, New Zealand. As an oral medicine specialist, he has a special interest in orofacial pain and oromucosal diseases. His primary research interest is in oral cancer, particularly developing prognostic or predictive molecular markers that can be used for assessment of the severity of the disease, prognosis, and therapy. He also has experience in a wide range of temporomandibular joint, oral mucosal diseases and oral medicine education research projects.

Traditional oral cancer diagnosis methods based on scalpel biopsy and histological investigation are invasive, subjective, and time consuming. Cellular mechanical properties have been shown to be novel biomarkers which can discriminate certain cancer cells from their normal counterparts. Atomic force microscopy (AFM) has been used for the non-invasive imaging and mechanical analysis of living cells and, importantly, it requires very few cells for an accurate diagnosis. Dr Guan has commenced a PhD research project to investigate whether AFM could be used to improve early oral cancer diagnosis with a new non-invasive technique.

In the past two years (2019-20), Dr Guan has published 15 research articles in peer review journals and 9 articles in non-peer review journals. He has received three grants from NZDRE, SJWRI DClinDent Research Grant and Health Research Council of New Zealand.

Key publications 2019-2020

Guan, G., Mei, L., Polonowita, A., Hussaini, H., Seo, B., & Rich, A. M. (2020). Malignant transformation in oral lichen planus and lichenoid lesions: A 14-year longitudinal cohort study of 829 patients in New Zealand. *Oral Surgery, Oral Medicine, Oral Pathology & Oral Radiology*. Advance online publication. doi: 10.1016/j.oooo.2020.07.002

Guan, G., Lau, J., Yew, V., J-Y., Qu, W-W., Lam, J., Polonowita, A., & Mei, L. (2020). Referrals by general dental practitioners and medical practitioners to oral medicine specialists in New Zealand: A study to develop protocol guidelines. *Oral Surgery, Oral Medicine, Oral Pathology & Oral Radiology*, 130(1), 43-51. e5. doi: 10.1016/j.oooo.2020.03.050

Mei, L., Lai, Y., Lee, P., Ng, A., Tan, K., Zafar, S., & Guan, G. (2020). Final year dental students' career plans, work patterns, work-life balance and domestic life in New Zealand and Australia. *European Journal of Dental Education*. Advance online publication. doi: 10.1111/eje.12556

Ly, N., Sun, M., Polonowita, A., Mei, L., & Guan, G. (2020). Management of oral medicine emergencies during COVID-19: A study to develop practice guidelines. *Journal of Dental Sciences*. Advance online publication. doi: 10.1016/j.jds.2020.07.016

Nicholas C. K. Heng

BSc(Hons) PhD(Otago)

Senior Lecturer, Department
of Oral Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=444>

Dr Nick Heng's research expertise is in the field of molecular microbiology, specialising in the following areas:

- i. Genomics of micro-organisms involving state-of-the-art DNA sequencing technologies and bioinformatics.
- ii. The use of next-generation DNA sequencing technology to investigate changes in the oral microbiota (oral microbial populations) in relation to oral health and disease.
- iii. Characterisation of antimicrobial proteins (bacteriocins) produced by oral bacteria.

The scope of research conducted by Dr Heng's group during 2019-2020 included:

- i. Whole-genome sequencing (and bioinformatics) of bacterial species from marine mammals using the PGM (Ion Torrent) DNA sequencing platform,
- ii. Genomic characterisation of *Streptococcus mitis* in relation to bacteriocin resistance; and
- iii. The analysis of Illumina short-read DNA sequence data to profile bacteriocin-producing oral bacteria.

Within the Faculty of Dentistry, Dr Heng currently has ongoing collaborations with Associate Professor Geoffrey Tompkins (Discipline of Molecular Microbiology), and Dr Carolina Loch (Oral Biology) in relation to the molecular microbiology of dental caries and marine mammal microbiomes. In addition, he has ongoing research collaborations with (i) Professor Amarila Malik (Universitas Indonesia, Indonesia – bacterial genomics), and (ii) Professor John Tagg and Dr John Hale (Blis Technologies – bacteriocins).

Key publications 2019-2020

Reid, P., Heng, N.C.K., Hale, J.D., Krishnan, D., Crane, J., Tagg, J.R., & Milne, T.J. (2020). A TaqMan™-based quantitative PCR screening assay for the probiotic *Streptococcus salivarius* K12 based on the specific detection of its megaplasmid-associated salivaricin B locus. *Journal of Microbiological Methods* 170, 105837. <https://doi.org/10.1016/j.mimet.2020.105837>.

Heng, N.C.K., & Stanton, J.L. (2020). Next-generation DNA sequencing of oral microbes at the Sir John Walsh Research Institute: technologies, tools and achievements. *Journal of the Royal Society of New Zealand* 50, 91-107.

Gonçalves, L.S., de Carvalho, Ferreira, D., Heng, N.C.K., Vidal, F., Dos Santos, H.F., Zanicotti, D.G., Vasconcellos, M., Stambovsky, M., Lawley, B., de Paula Motta Rubini, N., Regina Netto Dos Santos, K., & Seymour G.J. (2019). Oral bacteriome of HIV-1-infected children from Rio de Janeiro - Brazil: Next-generation DNA sequencing analysis. *Journal of Clinical Periodontology* 46, 1192-1204.

Sartono, G., Rizqiyah, I., Asmarinah, A., Heng, N.C.K., & Malik, A. (2019). Three bacteriocin peptides from a lactic acid bacterium *Weissella confusa* MBF8-1 with spermicidal activity. *Current Pharmaceutical Biotechnology* 20, 766-771.

Haizal Mohd Hussaini

BDS MDentSc(Leeds)
PhD(Otago) FDSRCSEd

Associate Professor,
Department of Oral Diagnostic
and Surgical Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2090>

Dr Hussaini is an oral pathologist with research interests in oral cancer. His research focus is in investigating immune responses in the tumour microenvironment of oral squamous cell carcinoma, particularly in the modulation of the immune system by cancer cells in the process of metastasis. This research interest began in 2007 with subsequent completion of his PhD thesis in 2013. Within the Oral Molecular and Immunopathology Research programme, he has expanded his research area to look into immune tolerance in metastatic lymph nodes and early failure of immune cells, angiogenesis in metastatic lymph nodes and myofibroblast in oral cancer progression, and many other oral cancer related research. He has also been involved in translational research work, currently leading an inter-faculty research team (Faculty of Dentistry and School of Pharmacy, University of Otago) undertaking translational research relating to the development of immunotherapy for endodontic practice, a much needed, yet inactive area of research in New Zealand. This project is funded by a 2020 Emerging Researcher Grant from the Health Research Council of New Zealand, worth \$206,000. This research collaboration will be the first in the world investigating the use of immunotherapy for dental therapeutic use.

Over 2019-2020, Dr Hussaini was primary supervisor of one DClinDent student, two full-time PhD students, and a co-supervisor of three others. At international level, Dr Hussaini is the current regional councillor for Australasia for the International Association of Oral Pathologists, which assists international members in various diagnostic and research work. Dr Hussaini has an international research collaboration with the Oral Cancer Research Coordinating Centre, Malaysia, a key research institute and oral cancer tissue bank in South East Asia, and with the University of Trisakti and University of Airlangga, Indonesia.

Key publications 2019-2020

Rich, A. M., Hussaini, H. M., Seo, B., & Zain, R. B. (2020). Understanding the complex microenvironment in oral cancer: The contribution of the Faculty of Dentistry, University of Otago over the last 100 years. *Journal of the Royal Society of New Zealand*, 50(1), 15-34. doi: 10.1080/03036758.2020.1736586

Yakin, M., Seo, B., Hussaini, H., Rich, A., & Hunter, K. (2019). Human papillomavirus and oral and oropharyngeal carcinoma: The essentials. *Australian Dental Journal*, 64, 11-18. doi: 10.1111/adj.12652

Yu, Z., Seo, B., Hussaini, H. M., Meldrum, A. M., & Rich, A. M. (2020). The relative frequency of paediatric oral and maxillofacial pathology in New Zealand: A 10-year review of a national specialist centre. *International Journal of Paediatric Dentistry*, 30, 209-215. doi: 10.1111/ipd.12590

Ludwig Jansen van Vuuren

BTechDent NatDipDentTech
(Technicon Pretoria)
MTechDent(Tshwane UT)

Senior Lecturer, Department
of Oral Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=532>

Ludwig Jansen van Vuuren is a Dental Technologist with research experience in micromechanical testing of biomaterials and dental hard tissue, which includes analysis of microstructure, mechanical properties and composition of teeth. He also has experience with a wide range of preparation and analytical techniques for dental studies.

During this period, Mr Jansen van Vuuren's research activities have been focused on his PhD thesis research, titled 'Dental Occlusal Stress', supervised by Professor Neil Waddell, Professor Warwick Duncan and Associate Professor Jonathan Broadbent. This research aims to develop a measurement model to evaluate the stress teeth may experience, to inform best practise in design and material selection for all-ceramic restorations. The testing model development is following a four phase approach;

1. Develop a bite force transducer
2. Record and measure maximum voluntary bite force and average occlusal contact area in healthy human volunteers
3. Develop a device and method to record periodontal ligament compression
4. Establish compression of the periodontal ligament of a sample of healthy human volunteers

The findings of this work will provide dental clinicians and technicians with better advice on the design and reliability of all-ceramic crowns. Further to this, he is testing new dental material properties as well as investigating the structure, microstructure and chemical composition of human and animal teeth, and relating the arrangement of these structures to their mechanical properties.

Key publications 2019-2020

Jansen van Vuuren, L., Broadbent, J. M., Duncan, W. J., & Waddell, J. N. (2020). Maximum voluntary bite force, occlusal contact points and associated stresses on posterior teeth. *Journal of the Royal Society of New Zealand*, 50(1), 132-143. doi: 10.1080/03036758.2019.1691612

Jansen van Vuuren, L., Jansen van Vuuren, W. A., Broadbent, J. M., Duncan, W. J., & Waddell, J. N. (2020). Development of a bite force transducer for measuring maximum voluntary bite forces between individual opposing tooth surfaces. *Journal of the Mechanical Behavior of Biomedical Materials*, 109, 103846. doi: 10.1016/j.jmbm.2020.103846

Prasad, S., Farella, M., Paulin, M., Yao, S., Zhu, Y., & Jansen van Vuuren, L. (2020). Effect of electrode characteristics on electromyographic activity of the masseter muscle. *Journal of Electromyography & Kinesiology*, 102492. Advance online publication. doi: 10.1016/j.jelekin.2020.102492

Jansen van Vuuren, W., Jansen van Vuuren, L., Aarts, J., Hanlin, S., & Waddell, J. N. (2020). Mechanical properties of denture base resin materials: CAD/CAM versus traditional heat-cure. *New Zealand Dental Journal*, 116(3), 81-89.

Wendy-Ann Jansen van Vuuren

**BTechDent NatDipDentTech
(Technicon Pretoria)
MTechDent(Otago)**

Senior Lecturer, Department
of Oral Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2039>

Mrs Jansen van Vuuren's research interests are in the field of mechanical properties and strength testing of dental bio-materials, with a focus on dental ceramics and indirect restorative materials. She conducts experimental and observational research investigating the structure and mechanical properties of bio-materials under different functional conditions. She is also interested in the field of Digital Dentistry and the impact thereof on the quality of Dental education. Wendy works with her colleagues in the Bio-materials research group within the Sir John Walsh Research Institute and has been the main event organiser for the Dental Technology Research Conference, held every year in Dunedin.

Key publications 2019-2020

Jansen van Vuuren, W., Jansen van Vuuren, L., Aarts, J., Hanlin, S., & Waddell, J. N. (2020). Mechanical properties of denture base resin materials: CAD/CAM versus traditional heat-cure. *New Zealand Dental Journal*, 116(3), 81-89.

Jansen van Vuuren, L., Jansen van Vuuren, W. A., Broadbent, J. M., Duncan, W. J., & Waddell, J. N. (2020). Development of a bite force transducer for measuring maximum voluntary bite forces between individual opposing tooth surfaces. *Journal of the Mechanical Behavior of Biomedical Materials*, 109, 103846. doi: 10.1016/j.jmbbm.2020.103846

Jansen van Vuuren, W.-A., Al-Amleh, B., Alkharusi, A., Dohan, Z., & Waddell, J. N. (2019). Surface Crack in Flexure versus the Vickers indentation method for calculating fracture toughness in two veneering porcelain. *New Zealand Dental Journal*, 115(4), 151-156.

Gowans, L. J. J., Cameron-Christie, S., Slayton, R. L., Busch, T., Romero-Bustillos, M., Eliason, S., ... Drummond, B. K., Markie, D. M., Jansen van Vuuren, W., Jansen Van Vuuren, L., ... van Staden, I., ... Robertson, S. P., & Butali, A. (2019). Missense pathogenic variants in KIF4A affect dental morphogenesis resulting in X-linked taurodontism, microdontia and dens-invaginatatus. *Frontiers in Genetics*, 10, 800. doi: 10.3389/fgene.2019.00800

Mikhail V. Keniya

**Specialist(Hons) Kandidat
Nauk(Rostov State)**

Senior Research Fellow,
Department of Oral Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=533>

Dr Keniya has investigated mechanisms of drug resistance in fungi and the structural biology of Cytochrome P450, based on his expertise in microbiology, protein chemistry, enzymology and molecular genetics.

He is a full-time associate investigator in the project *Readying next-generation antifungals for drug development* (HRC of New Zealand 2019-2021, PI BC Monk) In part, this investigation is based on the discoveries made within the projects "Structure-directed discovery of next-generation antifungals" (HRC of New Zealand, 2016-2019, PI BC Monk) and "Multifunctional azoles: A triple whammy designed to defeat drug resistance" (Marsden Fund, 2011-2015, PI BC Monk). The research involves molecular biological, biochemical studies and structural with emphasis in creating yeast producer and tester strains that express functional drug targets from pathogenic fungi and screening scaffolds for novel azole inhibitors of lanosterol 14 α -demethylase.

Work on co-expressing of drug targets (LDM and CPR) from pathogen *Rhizopus arrhizus* was done in a research collaboration with Assoc. Prof. Michaela Lackner (Medical University of Innsbruck). The other collaborators are MicroCombiChem e.K, Germany and Professor DS Perlin (Rutgers University, USA). This collaboration was funded by a Catalyst Fund Seeding grant: ("Tools for drug discovery from an ancient fungal family" awarded to Assoc. Prof. BC Monk).

Dr Keniya co-supervised two PhD candidates: Yasmeen Nazim Ruma (Project: Development of *Cryptococcus neoformans* and *Candida parapsilosis* CYP51s as drug targets) and Parham Hosseini (Project: Development of *Aspergillus fumigatus* CYP51 isoforms as drug targets). In 2019-2020 he co-authored 2 articles, and 1 conference presentation.

Key publications 2019-2020

Monk, B. C., Sagatova, A. A., Hosseini, P., Ruma, Y. N., Wilson, R. K., & Keniya, M. V. (2020). Fungal lanosterol 14 α -demethylase: A target for next-generation antifungal design [Invited review]. *Biochimica et Biophysica Acta: Proteins & Proteomics*, 1868, 140206. doi: 10.1016/j.bbapap.2019.02.008

Keniya, M. V., & Monk, B. C. (2019). Attenuated apoptotic BAX expression as a xenobiotic reporter in *Saccharomyces cerevisiae*. *FEMS Yeast Research*, 19(5), foz048. doi: 10.1093/femsyr/foz048

Erwin Lamping

DiplIng Dr rer nat(TU Graz)

Senior Research Fellow, Sir John Walsh Research Institute



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2006>

Dr Lamping has expertise in biochemistry, genetics and molecular biology, and is particularly interested in studying the structure and function of eukaryotic membrane proteins associated with multidrug resistance of oral fungal pathogens and human cancer cells. A significant part of his research is dedicated to creating efficient tools for the study of integral membrane proteins and synthetic biology in the eukaryotic model organism, *Saccharomyces cerevisiae*. His interests also include studies of the fungal mycobiome of the oral cavity and how it affects the health and well-being of the elderly and other vulnerable population groups.

Dr Lamping created a suite of plasmids and yeast strains for increased cloning efficiency of membrane protein genes and the detailed characterization of membrane proteins associated with antifungal drug resistance of the major human fungal pathogen, *Candida albicans*, and the recently emerging pathogens *C. auris* and *Fusarium keratoplasticum*. He discovered how efflux pumps become resistant to inhibition by the immunosuppressor, FK506. He discovered three conserved extracellular disulphide bonds critical for folding and trafficking of *C. albicans* Cdr1, a cyp51A promoter deletion associated with voriconazole resistance in clinical *F. keratoplasticum* isolates, and characterized five *C. auris* efflux pumps, with Cdr1 being the major efflux pump responsible for the innate *C. auris* drug resistance phenotype.

During 2019-20, Dr Lamping published three research articles supported by grants from the Marsden Fund and NZDRF. He supervised two PhDs, one DClinDent and a summer student, and was an invited speaker at two international conferences. Collaborators include Professors Lutz Schmitt and Holger Gohlke (Düsseldorf, Germany), Associate Professors Alok Mitra (Auckland, NZ) and Jacinta Santhanam (Kuala Lumpur, Malaysia) and Drs Mihnea Bostina (Otago, NZ), Ariya Chindamporn (Bangkok, Thailand) and Masakazu Niimi (Tokyo, Japan).

Key publications 2019-2020

James, J. E., Lamping, E., Santhanam, J., Milne, T. J., Razak, M. F. A., Zakaria, L., & Cannon, R. D. (2020). A 23 bp cyp51A promoter deletion associated with voriconazole resistance in clinical and environmental isolates of *Neocosmospora keratoplastica*. *Frontiers in Microbiology*, 11, 272. doi: 10.3389/fmicb.2020.00272

Mohd Thiyahuddin, N., Lamping, E., Rich, A. M., & Cannon, R. D. (2019). Yeast species in the oral cavities of older people: A comparison between people living in their own homes and those in rest homes. *Journal of Fungi*, 5(2), 30. doi: 10.3390/jof5020030

Tanabe, K., Bonus, M., Tomiyama, S., Miyoshi, K., Nagi, M., Niimi, K., ... Cannon, R. D., Niimi, M., & Lamping, E. (2019). FK506 resistance of *Saccharomyces cerevisiae* Pdr5 and *Candida albicans* Cdr1 involves mutations in the transmembrane domains and extracellular loops. *Antimicrobial Agents & Chemotherapy*, 63(1), e01146-18. doi: 10.1128/aac.01146-18

Kai Chun Li

BDentTech(Hons) PhD(Otago)

Senior Lecturer, Department of Oral Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2374>

Dr Li's research expertise is in the structural and failure analysis of amorphous and crystalline materials. His main research focus has been developing micro-scale mechanical properties test to understand and predict failure in a wide range of synthetic and biological materials. Dr Li is also adept in applying 3D printing, engineering and programming to create new research tools. These skills have allowed experimental and analytical work to be conducted with enhanced reliability and standardisation by minimising operator and experimental errors. Through his research interest, Dr Li has developed ongoing collaborations with researchers within the Sir John Walsh Research Institute, Faculty of Dentistry, researchers within the University of Otago, and the Faculty of Science at the University of Auckland.

During 2019-2020, Dr Li has published 11 full-length journal articles and is a part of two successful external grants from NZDRF and Foundation Nakao. He has been acting as the main or co-supervisor for 1 PhD and Master's project, 6 DClinDent projects and 1 Honours project. He was appointed the topic and review editor for *Frontiers in Oral Health* in 2020 and is an active reviewer for international journals.

In 2020, in collaboration with the Department of Anatomy, he helped develop a standardised tensile test for soft tissue using a 3D printed clamping system and the methodology has been published in *HardwareX* where all resources have been made freely available for other researchers to use. Currently, Dr Li is working with Dr Johann Zwirner to develop a clamp-free tensile testing system designed for measuring the properties of very soft tissues.

Key publications 2019-2020

Porter, G. C., Tompkins, G. R., Schwass, D. R., Li, K. C., Waddell, J. N., & Meledandri, C. J. (2020). Anti-biofilm activity of silver nanoparticle-containing glass ionomer cements. *Dental Materials*, 36, 1096-1107. doi: 10.1016/j.dental.2020.05.001

Zwirner, J., Safavi, S., Scholze, M., Li, K. C., Waddell, J. N., Ondruschka, B., Hammer, N. (2020). Topographical mapping of the mechanical characteristics of the human neurocranium. *Scientific Reports*. doi: 10.1038/s41598-020-80548-y

Scholze, M., Safavi, S., Li, K. C., Ondruschka, B., Werner, M., Zwirner, J., Hammer, N. (2020). Standardized tensile testing of soft tissue using a 3D printed clamping system. *HardwareX*. doi: 10.1016/j.ohx.2020.e00159

Brimble, M. A., Dissanayake, S. S. M., Ekambaram, M., Li, K. C., Harris, P. W. R. (2020). Identification of Key Functional Motifs of Native Amelogenin Protein for Dental Enamel Remineralisation. *Molecules*. doi: 10.3390/molecules25184214

Carolina Loch Santos Da Silva

BSc(FU Santa Catarina) MSc(FU Paraná) PhD(Otago)

Senior Lecturer, Department of Oral Sciences

Programme leader,
Biomaterials, Biomechanics and Oral Implantology



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=2033>

Dr Loch's research focuses on evolutionary oral biology and comparative dental morphology, mainly using animal teeth to gather a wide range of information about the biology, evolution and interactions with the environment of fossil and recent species. Comparative dental anatomy and ultrastructure are some of the key components of her research. She is also interested in clinically applied biomaterials research, dental education development and health services research.

During 2019-2020, Dr Loch published 18 peer-reviewed papers in international journals, and was involved in research grants including two Colgate SJWRI Research Grants (one as PI and one as AI) and one MedTech CoRE grant as AI, totalling \$125K. She has co-supervised one PhD student to completion and attracted one postdoctoral fellow to her research programme. She has ongoing multidisciplinary collaborations with researchers at Otago (Departments of Geology, Chemistry, Anatomy, Zoology, Marine Sciences), other NZ Universities (Massey University, University of Auckland, Auckland University of Technology) and overseas institutions (USA: Smithsonian Institution USA, Hampden-Sydney College; UK: University of Kent, University of Leicester; Australia: University of Adelaide, South Australian Museum; Chile: Museo de Historia Natural de Santiago; Argentina: Centro Nacional Patagonico; Brazil: Universidade Federal de Santa Catarina). Dr Loch received a University of Otago Early Career Award for Distinction in Research in 2019, and a International Association of Dental Research Centennial Emerging Researcher Award in 2020.

Key publications 2019-2020

Loch, C., Vaz Viegas, S., Waddell, J. N., Kemper, C., Cook, R. B., & Werth, A. J. (2020). Structure and properties of baleen in the Southern right (*Eubalaena australis*) and Pygmy right whales (*Caperea marginata*). *Journal of the Mechanical Behavior of Biomedical Materials*, 110, 103939. doi: 10.1016/j.jmbbm.2020.103939

Loch, C., Kuan, I. B. J., Elsalem, L., Schwass, D., Brunton, P. A., & Jum'ah, A. A. (2020). COVID-19 and dental clinical practice: Students and clinical staff perceptions of health risks and educational impact. *Journal of Dental Education*. Advance online publication. doi: 10.1002/jdd.12402

Werth, A. J., Loch, C., & Fordyce, R. E. (2020). Enamel microstructure in Cetacea: A case study in evolutionary loss of complexity. *Journal of Mammalian Evolution*, 27, 789-805. doi: 10.1007/s10914-019-09484-7

Loch, C., Buono, M. R., Kaithoff, D. C., Mörs, T., & Fernández, M. S. (2019). Enamel microstructure in Eocene cetaceans from Antarctica (Archaeoceti and Mysticeti). *Journal of Mammalian Evolution*, 27, 289-298. doi: 10.1007/s10914-018-09456-3

Karl M. Lyons

**MDS PhD(Otago)
CertMaxillofacialPros(UCLA)
FRACDS**

Acting Dean (Apr 2019 - Jan 2020), Associate Dean (Clinical) and Director of Clinical Education, Faculty of Dentistry

Professor, Department of Oral Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=200>

Professor Lyons has carried out clinical and in vitro research in dental tooth whitening, dental implants, microbial adhesion to dental obturator prostheses as well as ceramics and other dental materials, including CAD/CAM and 3D printing. His research has included collaborative research with postgraduate students including DClintDent and PhD students.

Professor Lyons is undertaking collaborative work with Associate Professor Azam Ali from the Centre for Bioengineering and Nanomedicine, Department of Oral Rehabilitation, that has included the award of an HRC Explorer Grant for a project titled "No Drill No Fill" and a University of Otago Research Grant. He is also carrying out work on dental tourism with Professor Brent Lovelock from the Department of Tourism on a project that received support from a University of Otago Research Grant and which resulted in a publication in *Tourism Management*, with Professor John Beumer from UCLA that includes co-authoring a number of book chapters for a second edition oral implant textbook and an upcoming third edition of the same textbook, that is also including contributions from a number of colleagues in the Faculty of Dentistry.

Professor Lyons has co-supervised two DClintDent completions in 2019-20 and is currently supervising four DClintDent projects and one PhD project. He is also currently President of the Australia and New Zealand Division of the International Association for Dental Research, and is also a member of Council for IADR.

Key publications 2019-2020

Kothari, S.P., Jum'ah, A.A., Gray, A. R., Lyons, K.M., Yap, M., and Brunton, P.A. (2020). A randomized clinical trial investigating three vital tooth bleaching protocols and associated efficacy, effectiveness and participants' satisfaction. *Journal of Dentistry*. doi: <https://doi.org/10.1016/j.jdent.2020.103322>

Barazanchi, A., Li, K.C., Waddell, J.N., Al-Amleh, B., and Lyons, K.M. (2020). Adhesion of porcelain to three-dimensionally printed and soft milled cobalt chromium. *Journal of Prosthodontic Research*. 64(2): 120-127

Ali, A., Gould, M., and Lyons, K. (2020). Development of an organic-inorganic nanostructured hybrid dental biocomposite. *Journal of Nanoscience and Nanotechnology*. 20(8): 5252-5259. doi: <https://doi.org/10.1166/jnn.2020.18527>

Chen, M., Lyons, K., Tawse-Smith, A., Ma, S. (2019). Resonance frequency analysis in assessing implant stability: a retrospective analysis. *International Journal of Prosthodontics*. 32(4):317-326. doi: 10.11607/ijp.6057

Sunyoung Ma

**BDS DClinDent PhD (Otago)
FPFA**

Associate Dean (Postgraduate
Studies)

Associate Professor,
Department of Oral
Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=596>

Dr Ma's research interests include conducting clinical trials using different treatment modalities involving dental implants for patients, particularly of older age, that need to replace their missing teeth. This work has looked at both the biological success of the treatment as well as any long-term clinical maintenance issues and complications for both clinicians and patients including any treatment impact on oral health related quality of life for these patients. Dr Ma is also primary investigator on research evaluating the clinical stability of zirconia abutments in association with low-temperature degradation and wear at the titanium-zirconia implant-abutment interfaces.

With ongoing national and international collaborations in addition to previous and ongoing research funding support, Dr Ma continues to produce research outputs in the areas of oral implantology and gerodontology. Across 2019-20, Dr Ma published 6 articles in peer-reviewed international journals and gave 5 conference abstracts/presentations at national/international research meetings). Dr Ma has had multiple international invitations to present her research in these areas and is currently working on several projects related to different technologies used to rehabilitate patients with missing teeth. She has supervised multiple undergraduate and postgraduate research projects and is actively involved as a reviewer for multiple international peer reviewed journals and grant applications.

Key publications 2019-2020

Cheah C, Lim C, Ma S (2020). The dentist will scan you now: the next generation of digital-savvy graduates. *European Journal of Dental Education*. doi:10.1111/eje.12596.

Choi JJE, Zwirner J, Ramani RS, Ma S, Hussaini HM, Waddell JN, Hammer N. Mechanical properties of human oral mucosa tissues are site dependent: a combined biomechanical, histological and ultrastructural approach. *Clinical and Experimental Dental Research*. doi:10.1002/cre2.305.

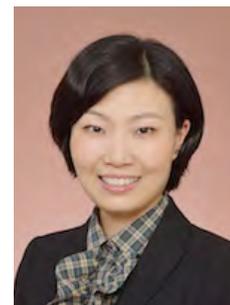
Al Lawati I, Al Maskari H, Ma S (2019). I am a lefty in a right-handed world: qualitative analysis of clinical learning experience of left-handed undergraduate dental students. *European Journal of Dental Education*. doi:10.1111/eje.12432.

Ma S, Tawse-Smith A, Brown SDK, Duncan W (2019). Immediately restored single implants in the aesthetic zone of the maxilla using a novel design: 5-year results from a prospective single-arm clinical trial. *Clinical Implant Dentistry and Related Research*. 21:344-351.

May Lei Mei

MDS(Nanjing) PhD(HK)

Senior Lecturer, Department
of Oral Rehabilitation



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=3192>

Dr May Mei's research focuses on two themes, the use of silver diamine fluoride in caries management and developing bioactive materials for caries management.

In the past two years (2019-20), Dr May has published 19 research articles in peer review journals. Across this period, she received one external grants from NZDRF as principal investigator, and three external grants as co-investigator, with a total amount of approximately 408,000 NZD. She supervised two PhD students to successful and timely completion during this period. My key collaborators are colleagues from Faculty of Dentistry, the University of Hong Kong.

In 2020, Dr Mei was a recipient of the International Association for Dental Research Centennial Emerging Leaders Award, which was to be presented at the 98th IADR General Meeting, Washington DC, USA, 2020 (unfortunately the meeting was cancelled due to COVID-19 Pandemic outbreak). Dr Mei was also awarded the 2019 Basil G. Bibby Young Investigator Award from the IADR Cariology research group at the 97th IADR General Meeting, Vancouver, Canada, and the Oral Biology Award of the Australia/New Zealand Division of the IADR in 2020.

Key publications 2019-2020

Mei ML, Yan Z, Duangthip D, Niu JY, Yu OY, You M, Lo ECM, Chu CH. Effect of silver diamine fluoride on plaque microbiome in children. *J Dent*. 2020 Nov;102:103479. doi: 10.1016/j.jdent.2020.103479

Yin, I X., Zhang, J., Zhao, I. S., Mei, M. L., Li, Q., & Chu, C. H. (2020). The antibacterial mechanism of silver nanoparticles and its application in dentistry. *International Journal of Nanomedicine*, 15, 2555-2562. doi: 10.2147/IJN.S246764

Yin IX, Yu OY, Zhao IS, Mei ML, Li QL, Tang J, Chu CH. Developing biocompatible silver nanoparticles using epigallocatechin gallate for dental use. *Arch Oral Biol*. 2019 Jun;102:106-112. doi: 10.1016/j.archoralbio.2019.03.022

Dai, L. L., Mei, M. L., Chu, C. H., & Lo, E. C. M. (2019). Mechanisms of bioactive glass on caries management: A review. *Materials*, 12(24), 4183. doi: 10.3390/ma12244183

Peter Li Mei

**BDS MDS DDS(Sichuan)
PhD(Groningen)**

Associate Professor,
Department of Oral Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=1262>

Associate Professor Mei's research expertise is in biofilms, microbiomics, antimicrobial strategies, craniofacial biology, orthodontics, caries, and halitosis. His recent research activities are mainly focused on the mechanism and prevention of bacterial adhesion and biofilm formation on dental materials.

He has measured the adhesion forces between living bacteria and orthodontic materials using atomic force microscopy at a nano-level, and decoupled the bacterial adhesion forces into specific and non-specific forces. In addition, he has investigated measures for preventing biofilm formation using quaternary ammonium compounds. He developed a novel contact-killing surface by incorporating quaternary ammonium compounds into composite resin and studied its efficacy of killing the adhered bacteria and its bio-safety for human cells. He has investigated clinical methods for enhancing oral hygiene in patients wearing fixed orthodontic appliances.

His other interests include randomized controlled trials (RCT), evidence-based dentistry, systematic reviews and meta-analysis, dental education, and the 'business' of dentistry.

Key publications 2019-2020

Guan, G., Won, J., Mei, L., & Polonowita, A. (2020). Extensive adipose replacement of the parotid glands: An unusual presentation of sialadenosis: A case report and literature review. *Oral Surgery*, 13, 41-47. doi: 10.1111/ors.12442

Jiang, Y., Tang, T., Mei, L., & Li, H. (2020). COVID-19 affected patients' utilization of dental care service [Short communication]. *Oral Diseases*. Advance online publication. doi: 10.1111/odi.13568

Ly, N., Sun, M., Polonowita, A., Mei, L., & Guan, G. (2020). Management of oral medicine emergencies during COVID-19: A study to develop practice guidelines. *Journal of Dental Sciences*. Advance online publication. doi: 10.1016/j.jds.2020.07.016

Jiang, Q., Yang, R., Li, M., Ma, Q., Wu, T., & Li, H. (2019). A novel approach of torque control for maxillary displaced incisors. *American Journal of Orthodontics & Dentofacial Orthopedics*, 155(6), 860-870. doi: 10.1016/j.ajodo.2017.11.045

Trudy J. Milne

PhD(Qld UT) NZCS

Senior Research Fellow, Sir
John Walsh Research Institute



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=534>

Dr Milne's research continues in a number of oral health areas including endodontics, periodontology and orthodontics. Investigation of periodontopathogens and their association with angiogenic and inflammatory gene expression in dental pulp continues with the hope of improved dental treatment outcomes for smokers and patients with Type 2 diabetes. A study of a grafting material in a bone-healing sheep model and the genes associated with osteogenesis aims to advance the development of implant options for dental patients. Dr Milne is also investigating the role osteoblasts and periodontal ligament cells play in the immune response and bone remodelling during orthodontic tooth movement.

During 2019-2020 Dr Milne co-supervised six students on a number of collaborative projects, including DCLinDent (Orthodontics) candidate Marguerite Paterson looking at the effect of IL-17 and IL-6 on osteoblasts and periodontal ligament cells, with Dr Fiona Firth and Professor Mauro Farella of the Craniofacial Research programme; Shaikha Alsamahi (PhD) with Professor Alison Rich, Dr Lara Friedlander and Dr Haizal Hussaini of the Oral Molecular and Immunopathology programme; and Zhen Dong (PhD) and DCLinDent (Periodontology) graduates Anumala Ram, Tatiana Tkatchenko and Saeideh Nobakht, whose research was co-supervised with Clinical and Translational Research programme members Professor Warwick Duncan and Associate Professor Dawn Coates.

Dr Milne has been supported with grants from the New Zealand Dental Research Fund. Following a number of successful collaborations Dr Milne has published six co-authored peer-reviewed articles in 2019-2020.

Key publications 2019-2020

Reid, P., Heng, N. C. K., Hale, J. D., Krishnan, D., Crane, J., Tagg, J. R., & Milne, T. J. (2020). A TaqMan™-based quantitative PCR screening assay for the probiotic *Streptococcus salivarius* K12 based on the specific detection of its megaplasmid-associated salivarin B locus. *Journal of Microbiological Methods*, 170, 105837.

Perry, S. E., Huckabee, M.-L., Tompkins, G., & Milne, T. J. (2020). The association between oral bacteria, the cough reflex and pneumonia in patients with acute stroke and suspected dysphagia. *Journal of Oral Rehabilitation*, 47, 386-394. doi: 10.1111/joor.12903

Firth, F. A., Milne, T. J., Seo, B., & Farella, M. (2020). An in-vitro mechanical strain three-dimensional culture model: Periodontal ligament cell viability, apoptosis, and endoplasmic reticulum stress response. *European Journal of Oral Sciences*, 128, 120-127. doi: 10.1111/eos.12681

James, J. E., Lamping, E., Santhanam, J., Milne, T. J., Razak, M. F. A., Zakaria, L., & Cannon, R. D. (2020). A 23 bp cyp51A promoter deletion associated with voriconazole resistance in clinical and environmental isolates of *Neocosmospora keratoplastica*. *Frontiers in Microbiology*, 11, 272. doi: 10.3389/fmicb.2020.00272

Susan M. Moffat

BA PhD DPH(Otago)
CertDentTherp(Wgtn)

Senior Lecturer, Department
of Oral Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=262>

Susan Moffat's principal research interests are in the fields of dental public health, dental therapy history, and dental therapy/oral health therapy education and workforce.

Susan has been one of the pioneers in dental/oral health therapy research, and her work has laid some of the groundwork for an ongoing research foundation for both the dental therapy and oral health therapy disciplines.

Susan has collaborated with other Faculty staff on dental public health, dental workforce/education, and clinical research projects, and has collaborated internationally with researchers in Australia, the United States, and other countries, particularly on projects requiring knowledge of dental therapy or oral health therapy practice in New Zealand.

Susan's PhD research combined both workforce and dental public health research, centering on the development of the SDS within New Zealand's social, economic and political history.

In 2019, Susan was awarded The New Zealand Dental and Oral Health Therapists Association/the New Zealand Dental Hygienists' Association's Hon. Dame Annette King Award for Leadership and Excellence in Oral Health.

Key publications 2019-2020

Moffat, S. M. (2020). 'A bold experiment': The New Zealand School Dental Service and the Colombo Plan. *Journal of the Royal Society of New Zealand*, 50(1), 47-66. doi: 10.1080/03036758.2020.1713182

Carrington, S. D., Treharne, G. J., & Moffat, S. M. (2020). Job satisfaction and career prospects of Oral Health Therapists in Aotearoa/New Zealand: A research update and call for further research in light of the COVID-19 pandemic. *The Australian & New Zealand Journal of Dental & Oral Health Therapy*, 8(2), 8-13.

Olson, H., Beckett, D. M., Adam, L. A., Tawse-Smith, A., & Moffat, S. M. (2019). Self-perceived stressors of Bachelor of Oral Health students and implications for student support. *Focus on Health Professional Education*, 20(1), 36-49. doi: 10.11157/fohpe.v20i1.313

Moffat, S., Meldrum, A., Aitken, W., & Coates, D. (2019). 'Smile for the nurse': Oral health advice at infant immunisation. *Journal of Dental Research*, 98(Spec Iss A), 0932

Brian C. Monk

BSc(Hons)(Well) PhD(Monash)

Associate Professor,
Department of Oral Sciences
Programme Leader, Molecular
Microbiology Research
Director, Molecular Biosciences
Laboratory



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=617>

Associate Professor Monk's primary research interests are in drug discovery and drug resistance. With support from ongoing Health Research Council of NZ (HRC) funding, he has developed a unique yeast-based protein expression platform that provides basic knowledge and tools to combat infectious disease through phenotype-based and structure-directed drug discovery, especially where drug resistance poses an important threat. Most of the targets he has prototyped for antimicrobial discovery are membrane proteins, including drug efflux pumps, fungal P-type ATPases and cytochrome P450 enzymes, expressed in yeast. Soluble targets expressed in bacteria have included lumazine synthase from *Candida glabrata* and DNA gyrase from *Thermus thermophilus*. Initially supported by a grant from the Marsden Fund and a collaboration with the NIH (USA) Roadmap Membrane Protein Expression Center, he obtained high resolution X-ray crystal structures for yeast lanosterol 14 α -demethylase +/- substrates and azole drugs. These first structures for a full-length membrane spanning cytochrome P450 have led to libraries of target-ligand complexes (>30 structures), with major impact on antifungal discovery, and on drug discovery and development in general. This has attracted funding of three 3-year project grants from 2013-2022 totalling \$3.5 million. The yeast expression system Monk patented is a key component of his research platform and is employed widely to express membrane proteins from sources including pathogenic fungi, plants, nematodes and humans. Monk's research also included defining and/or mitigating echinocandin (a new antifungal class) resistance, expressing fungal, human and parasite drug targets for drug screening and combating dental pathologies. Monk's research group provides an environment and network for undergraduate and graduate researchers to gain experience with membrane proteins, including drug targets.

Key publications 2019-2020

Monk, B. C., Sagatova, A. A., Hosseini, P., Ruma, Y. N., Wilson, R. K., & Keniya, M. V. (2020). Fungal lanosterol 14 α -demethylase: A target for next-generation antifungal design [Invited review]. *Biochimica et Biophysica Acta: Proteins & Proteomics*, 1868, 140206. doi: 10.1016/j.bbapap.2019.02.008

Youhanna, K. M. M., Adam, L., Monk, B., & Loch, C. (2020). Dentistry students' experiences, engagement and perception of biochemistry within the dental curriculum and beyond. *European Journal of Dental Education*. Advance online publication. doi: 10.1111/eje.12607

Monk, B. C., Keniya, M. V., Sabherwal, M., Wilson, R. K., Graham, D. O., Hassan, H. F., Chen, D., & Tyndall, J. D. A. (2019). Azole resistance reduces susceptibility to the tetrazole antifungal VT-1161. *Antimicrobial Agents & Chemotherapy*, 63(1), e02114-18. doi: 10.1128/AAC.02114-18

Keniya, M. V., & Monk, B. C. (2019). Attenuated apoptotic BAX expression as a xenobiotic reporter in *Saccharomyces cerevisiae*. *FEMS Yeast Research*, 19(5), foz048. doi: 10.1093/femsyr/foz048

Hanna Olson

Tandhygienistexamen
(Gothenburg) MHSK(Kristianstad)

Lecturer, Department of Oral
Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=1768>

Hanna Olson is a Lecturer, Deputy Convenor of the BOH Programme and Programme Interprofessional (IPE) Convenor within the Faculty of Dentistry. She contributes to the advancement of teaching and learning activities in particular for the group of oral health students. Her research highlights a learner-centred approach including facilitation of IPE activities across health professional educational programmes within the University as well as coordination of health promotion projects in the community.

Key publications 2019-2020

Abdullah, R., Olson, H., Todd, G., & Tong, D. (2020). Oral health perceptions, attitudes and knowledge among intensive care nursing staff in a tertiary hospital. *Australian & New Zealand Journal of Dental & Oral Health Therapy*, 8(1), 15-18.

Olson, H., Ronayne, C., Anakin, M., Meldrum, A., & Rich, A. (2020). Working together in clinical pathology: An interprofessional education initiative for dentistry, oral health, and medical laboratory science teachers and students [Version 2]. *MedEdPublish*. Advance online publication. doi: 10.15694/mep.2020.000009.2

Olson, H., Meldrum, A., & Smith, L. (2019). New Zealand and Swedish dental hygienists' perceptions of their work and job satisfaction. *Australian & New Zealand Journal of Dental & Oral Health Therapy*, 7(3), 24-28.

Olson, H., Beckett, D. M., Adam, L. A., Tawse-Smith, A., & Moffat, S. M. (2019). Self-perceived stressors of Bachelor of Oral Health students and implications for student support. *Focus on Health Professional Education*, 20(1), 36-49. doi: 10.11157/fohpe.v20i1.313

Jithendra T. B. Ratnayake

BE(Hons)(Sheff) PhD(Otago)

Lecturer, Department of Oral
Sciences



<https://www.otago.ac.nz/sjwri/people/profile/?id=3130>

Dr Ratnayake's main research interest is on developing novel biomaterials from waste materials, in particular in adding value to waste products from New Zealand's annual \$NZ6 billion red meat export industry. He has significant expertise in characterizing biomaterials using various analytical techniques and evaluating the biocompatibility using *in vitro* and *in vivo* techniques. He is also interested in developing medical devices, dental materials, management of temporomandibular disorders, endodontic applications and treatments, restorative dentistry and dental education. His current research is focused on developing novel bone grafts from bovine and ovine bone for bone regeneration applications; developing bio-composite materials for biomedical applications (e.g. wound dressing, cleft lip palate repair, orthopaedics); development and testing of a bovine-derived nanohydroxyapatite toothpaste for caries management; development of a novel hydroxyapatite-based vital pulp therapy material synthesized from waste bovine bone; and a novel approach for the diagnosis and monitoring of temporomandibular disorders.

Dr Ratnayake has collaborations with Colgate Palmolive Ltd, ANZCO Foods and Intuitive 8 Healthcare LLC (India), and with universities in the UK, Australia, Saudi Arabia, China, Sri Lanka and the USA. Locally, collaborators include Professor Paul Brunton (PVC Health Sciences), Professor George Dias (Department of Anatomy) and Professor Paul Cooper of the SJWRI. His PhD "Developing a novel bone graft from NZ sourced bovine bone", for which a provisional patent was filed, was completed in 2017. His current postgraduate supervision includes Jeffrey Huang, Minati Chaudhury, Zohaib Khurshid, Aida Nghah (all PhD) and David Yong (DClinDent).

Key publications 2019-2020

Ramesh, N., Ratnayake, J. T. B., Moratti, S. C., & Dias, G. J. (2020). Effect of chitosan infiltration on hydroxyapatite scaffolds derived from New Zealand bovine cancellous bones for bone regeneration. *International Journal of Biological Macromolecules*, 160, 1009-1020. doi: 10.1016/j.ijbiomac.2020.05.269

Ratnayake, J. T., Ross, E. D., Dias, G. J., Shanafelt, K. M., Taylor, S. S., Gould, M. L., Guan, G., & Cathro, P. R. (2020). Preparation, characterisation and in-vitro biocompatibility study of a bone graft developed from waste bovine teeth for bone regeneration. *Materials Today Communications*, 22, 100732. doi: 10.1016/j.mtcomm.2019.100732

Huang, J., Ratnayake, J., Ramesh, N., & Dias, G. J. (2020). Development and characterization of a biocomposite material from chitosan and New Zealand-sourced bovine-derived hydroxyapatite for bone regeneration. *ACS Omega*, 5, 16537-16546. doi: 10.1021/acsomega.0c01168

Ratnayake, J., Guan, G., Polonowita, A., Li, K. C., Gray, A., Waddell, J. N., Loch, C., & Brunton, P. A. (2020). Can the measurement of jaw-opening forces assist in the diagnosis of temporomandibular disorders? *Journal of Oral & Facial Pain & Headache*, 34(3), 199-205. doi: 10.11607/ofph.2587

Alison Rich

**BDS (Otago) MDSc PhD (Melb)
FRACDS FFOP (RCPA) FRCPath**

Professor, Department of
Oral Diagnostic and Surgical
Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=215>

Professor Rich's research in the broad field of oral pathology is focused on the immunopathogenesis of various oral diseases. This research informs her work as a specialist diagnostic oral pathologist and Head of the Oral Pathology Centre, the national oral pathology diagnostic service. She leads the Oral Molecular and Immunopathology Research Group of the Sir John Walsh Research Institute. The interests of the group are the regulation of the microenvironment in oral squamous cell carcinoma with respect to local and nodal immune control and interaction with vascular and lymphatic systems. Factors relating to the immune response and angiogenesis and lymphangogenesis in immune-mediated oral mucosal diseases and in pulpal disease are also being investigated.

Research achievements in 2019-20 included the enrolment and progression of excellent PhD and DClintDent students under her supervision and our success in attracting significant grant funding from the New Zealand Dental Research Foundation and the Ministry of Health Oral Health Research Fund. Professor Rich's research collaboration with the Oral Cancer Research and Co-ordinating Centre of Malaysia has resulted in a number of on-going projects.

Key publications 2019-2020

Lu EM, Ratnayake J, Rich AM, Assessment of proliferating cell nuclear antigen (PCNA) expression at the invading front of oral squamous cell carcinoma. *BMC Oral Health* 19:233 doi: 10.1186/s12903-019-0928-9

Rich, A. M., Hussaini, H. M., Seo, B., & Zain, R. B. (2020). Understanding the complex microenvironment in oral cancer: The contribution of the Faculty of Dentistry, University of Otago over the last 100 years. *Journal of the Royal Society of New Zealand*. 50: 15-34

Yakin M, Seo B, Rich AM. Tunicamycin-induced endoplasmic reticulum stress up-regulated tumour-promoting cytokines in oral squamous cell carcinoma. *Cytokine* 120 130-143 2019

Yakin M, Seo B, Hussaini H, Rich A, Hunter K. Human papillomavirus and oral and oropharyngeal carcinoma: the essentials. *Australian Dental Journal* 2019 64: 11-18 doi: 10.1111/adj.12652.

Benedict Seo

BDS DClintDent PhD(Otago) FICD

Senior Lecturer, Department
of Oral Diagnostic and
Surgical Sciences



<https://www.otago.ac.nz/sjwri/people/profile/?id=1669>

Dr Benedict Seo is a specialist oral pathologist. He is a Senior Lecturer in Oral Pathology and a Consultant Oral Pathologist at the Oral Pathology Centre. He is an active member of the Oral Immunopathology Research Programme, Sir John Walsh Research Institute, and is involved in its various projects concerning oral squamous cell carcinoma (OSCC) pathobiology, with a special emphasis on cellular/metabolic stress and responses to those stimuli. His investigations include in vitro and ex vivo as well as blood and saliva models, and encompasses various techniques that examine gene, protein and cellular responses. He is also interested in the epidemiology of oral and maxillofacial pathology in New Zealand and abroad. Dr Seo investigates the pathogenesis of oral cancer, odontogenic lesions and immune-mediated oral diseases, with a particular focus on unfolded protein response (UPR) and endoplasmic reticulum (ER) stress. Techniques such as qRT2-PCR, IHC, histochemistry, western blot, cell culture and in vitro assays (viability, caspase-based, TUNEL) are employed in his research. He has an active research partnership with the University of Malaysia, Oral Cancer Research and Coordination Centre and the National University of Malaysia, as well as with Dunedin Public Hospital. Dr Seo is also a reviewer for the *Journal of Periodontal Research*, *Pathology* and *BMC Oral Health*. He has previously received the Oral Presentation Award from the International Association of Oral Pathologists (IAOP), Elman Poole Fellowship, IADR-Colgate Postgraduate Award and Sir Thomas Hunter Scholarship, amongst others.

Key publications 2019-2020

Firth, F. A., Milne, T. J., Seo, B., & Farella, M. (2020). An in-vitro mechanical strain three-dimensional culture model: Periodontal ligament cell viability, apoptosis, and endoplasmic reticulum stress response. *European Journal of Oral Sciences*, 128, 120-127. doi: 10.1111/eos.12681

Guan, G., Mei, L., Polonowita, A., Hussaini, H., Seo, B., & Rich, A. M. (2020). Malignant transformation in oral lichen planus and lichenoid lesions: A 14-year longitudinal cohort study of 829 patients in New Zealand. *Oral Surgery, Oral Medicine, Oral Pathology & Oral Radiology*, 130(4), 411-418. doi: 10.1016/j.oooo.2020.07.002

Al-Hassiny, A., Hussaini, H., Milne, T., Seo, B., Rich, A. M., & Friedlander, L. T. (2019). Vascularity and angiogenic signaling in the dentine-pulp complex of immature and mature permanent teeth. *European Endodontic Journal*, 4(2), 80-85. doi: 10.14744/ej.2019.26349

Yakin, M., Seo, B., & Rich, A. (2019). Tunicamycin-induced endoplasmic reticulum stress up-regulates tumour-promoting cytokines in oral squamous cell carcinoma. *Cytokine*, 120, 130-143. doi: 10.1016/j.cyt.2019.04.013

Andrew A. Tawse-Smith

DDS(Colombian Sch of Dent)
PhD(Otago)
CertPeriodontology (Göteborg)

Associate Professor,
Department of Oral Sciences



<https://www.otago.ac.nz/sjwri/people/profile/?id=536>

Dr Tawse-Smith's research interests involve the fields of oral implantology, and periodontology. His main research focus in oral implantology comprises a long-term clinical evaluation of patients who have been rehabilitated with various implant prostheses. He is currently investigating tribocorrosion of the implant surface and the association of titanium particle leakage and its impact on peri-implant health. He has also developed novel in-vitro methodologies to complement his ongoing clinical studies to investigate the efficacy of different implant surface decontamination protocols. He has also carried out systematic review-based research in dental implantology and periodontology. 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.

Dr Tawse-Smith completed his PhD "Presence and origin of titanium particles in peri-implant tissues" in 2018 and is working in collaboration with the Centre for Trace Element Analysis, Department of Chemistry and the Otago Micro and Nanoscale Imaging Unit of the University of Otago. He has international collaborations with universities and implant companies in South America, South Africa, Sweden and Australia. 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.

Key publications 2019-2020

Atieh, M. A., Pang, J. K., Lian, K., Wong, S., Tawse-Smith, A., Ma, S., & Duncan, W. J. (2019). Predicting peri-implant disease: Chi-squared automatic interaction detection (CHAID) decision tree analysis of risk indicators. *Journal of Periodontology*, 90, 834-846. doi: 10.1002/jper.17-0501

Chen, M. H.-M., Lyons, K., Tawse-Smith, A., & Ma, S. (2019). Resonance frequency analysis in assessing implant stability: A retrospective analysis. *International Journal of Prosthodontics*, 32(4), 317-326. doi: 10.11607/ijp.6057

Ma, S., Tawse-Smith, A., Brown, S. D. K., & Duncan, W. (2019). Immediately restored single implants in the aesthetic zone of the maxilla using a novel design: 5-year results from a prospective single-arm clinical trial. *Clinical Implant Dentistry & Related Research*, 21, 344-351. doi: 10.1111/cid.12733

Olson, H., Beckett, D. M., Adam, L. A., Tawse-Smith, A., & Moffat, S. M. (2019). Self-perceived stressors of Bachelor of Oral Health students and implications for student support. *Focus on Health Professional Education*, 20(1), 36-49. doi: 10.11157/fohpe.v20i1.313

W. Murray Thomson

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

Professor, Department of Oral
Sciences

Programme Leader, Dental
Epidemiology and Public Health Research



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Professor Thomson conducts research in the broad fields of dental epidemiology, dental public health and dental health services research. His work over the years has had considerable impact in the fields of socio-dental epidemiology, health services research and the oral health of older people. His influential life-course work in the renowned Dunedin Study has been complemented by his pivotal role in the development and testing of a number of important self-report measures now in wide use in oral health care. In a published bibliometric analysis, he was identified as one of the top contributors to dental public health research of the last half century, and his work also features in a 2021 overview of the 100 most cited papers in dental public health journals. His output includes 408 papers in peer-reviewed international scientific journals (>23,700 citations), and his Scopus h index is 55. Across 2019-20, he published 46 peer-reviewed papers, along with a major report, two commentary articles and one editorial. He was author or co-author of 9 conference presentations, including 7 keynote addresses, and gave 2 talks on his research to community groups. During this period he supervised 4 DCLinDent (Lee, Lau, Mohammad, Morelli) and 5 MComDent theses (Dixon, Goh, Holden, Lloyd, Naysmith), for a career total of 81 doctoral and Masters thesis completions. He currently supervises 7 DCLinDent (Johnson, Rupasinghe, Zainuddin, Tan, Praganta, Lintern, Oliver), 5 PhD (Antoun, Boyd, Benn, Bakri, Conrads), 1 MDent (Sese) and 2 MComDent theses (Narsinh, Stuart). From Jan 2015 to Jun 2021 he was the Editor-in-Chief of *Community Dentistry and Oral Epidemiology*. He has also served as Editor-in-Chief for *Gerodontology* since Apr 2021, and Associate Editor for the *European Journal of Oral Sciences* since Nov 2012. Among his many collaborations, his most fruitful international ones have been with the University of Adelaide, University of Sheffield, Duke University, Harvard University, New York University, University of Michigan, McGill University, University of Pelotas, Manipal University, Charité-Universitätsmedizin Berlin and Chongqing Medical University.

Key publications 2019-2020

Thomson WM. Subjective oral health measures for use with children: New Zealand's contribution to a burgeoning field. *Journal of the Royal Society of New Zealand* 50: 4-14 (2020).

Ferguson CA, Thomson WM, Kerse NM, Peri K, Gribben B. Medication taking in a national sample of dependent older people. *Research in Social and Administrative Pharmacy* 16: 299-307 (2020).

Thomson WM, Elani HW, He S. Self-report oral health and disease experience among adults in China and NZ. *Clinical Oral Investigations* 23: 2123-2128 (2019).

Thomson WM, Broadbent JM, Caspi A, Moffitt TE, Poulton R. Childhood IQ predicts age-38 oral disease experience and service-use. *Community Dentistry and Oral Epidemiology* 47: 252-258 (2019)

Graeme S. Ting

MSc MDS (Otago) FRACDS

Senior Lecturer, Department of Oral Diagnostic and Surgical Sciences



<https://www.otago.ac.nz/sjwri/people/profile/?id=2982>

Graeme Ting's specialist experience in clinical Special Needs Dentistry and Hospital Dentistry extends more than two decades. This experience includes provision of clinical dental services to people with medical problems, people with learning disabilities, mental health problems, physical disabilities and older people with dementia whose care is best provided from a hospital-based setting.

Mr Ting's research expertise is in the field of 'translational research' and the application of best practice protocols in the clinical setting. Examples include treatment of, and treatment guidelines for patients taking bisphosphonates and patients taking anticoagulant medications who require oral surgery and patients with inherited bleeding disorders.

He is interested in the oral health of people with special needs, with a particular focus on the oral health of older people with complex medical problems. He has researched the oral health of older people with dementia living in nursing homes in Auckland. Graeme has been involved at national level with the New Zealand Dental Association having helped to author a guidebook that teaches caregivers working in nursing homes, how to assist residents with oral health care. His interest in caring for people with special needs extends to those with hereditary bleeding disorders and he is current Chair of the Dental Committee for the World Federation of Haemophilia.

Geoffrey R. Tompkins

BSc PhD PGDipSci (Otago)

Associate Professor and Head of Department, Department of Oral Sciences



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=205>

Associate Professor Geoffrey Tompkins' principal research pursuit is in determining how the bacteria involved in periodontal disease acquire iron, an essential nutrient for all living cells. Additional interests involve collaborations with members of the Faculty of Dentistry from diverse disciplines including orthodontics, endodontics, periodontics, cariology, material sciences and respiratory infection. As a microbiologist employed in the Faculty of Dentistry, Associate Professor 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, Associate Professor 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 recognised 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.

Key publications 2019-2020

Perry, S. E., Huckabee, M.-L., Tompkins, G., & Milne, T. (2020). The association between oral bacteria, the cough reflex and pneumonia in patients with acute stroke and suspected dysphagia. *Journal of Oral Rehabilitation*, 47, 386-394. doi: 10.1111/joor.12903

Porter, G. C., Schwass, D. R., Tompkins, G. R., Bobbala, S. K. R., Medlicott, N. J., & Meledandri, C. J. (2020). AgNP/Alginate Nanocomposite hydrogel for antimicrobial and antibiofilm applications. *Carbohydrate Polymers*, 251, 117017. doi: 10.1016/j.carbpol.2020.117017

Porter, G. C., Tompkins, G. R., Schwass, D. R., Li, K. C., Waddell, J. N., & Meledandri, C. J. (2020). Anti-biofilm activity of silver nanoparticle-containing glass ionomer cements. *Dental Materials*, 36, 1096-1107. doi: 10.1016/j.dental.2020.05.001

Darryl C. Tong

ED BDS MB ChB PhD (Otago)
MSD (Wash) FFDRCSI FDSRCS
FFACOMS ACS

Professor and Head of
Department, Department of
Oral Diagnostic and Surgical
Sciences



<https://www.otago.ac.nz/sjwri/people/profile/?id=620>

Professor Darryl Tong's main research interests include military and civilian trauma with a particular focus on ballistic injuries to the head, face and neck, sports-related concussion, subconcussive impact force research and the development of an anatomical simulant head for forensic trauma investigations and surgical teaching. 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. Professor Tong's PhD involved 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.

Key publications 2019-2020

Kenny, C., Oldfield, L., Broadbent, J. M., & Tong, D. (2020). Common medications among dental outpatients: An update. *New Zealand Dental Journal*, 116(4), 121-126.

Abdullah, R., Olson, H., Todd, G., & Tong, D. (2020). Oral health perceptions, attitudes and knowledge among intensive care nursing staff in a tertiary hospital. *Australian & New Zealand Journal of Dental & Oral Health Therapy*, 8(1), 15-18.

Chapman, L., & Tong, D. (2019). Optimal follow-up time following lower third molar coronectomy: A clinical audit and literature review. *New Zealand Dental Journal*, 115(3), 89-95.

Ondruschka, B., Lee, J. H. C., Scholze, M., Zwirner, J., Tong, D., Waddell, J. N., & Hammer, N. (2019). A biomechanical comparison between human calvarial bone and a skull simulant considering the role of attached periosteum and dura mater. *International Journal of Legal Medicine*, 133, 1603-1610. doi: 10.1007/s00414-019-02102-4

Ian Towle

BSc(Hons)(Cardiff)
MSc(Bournemouth) PhD
(LJMU)

Sir Thomas Sidey Postdoctoral
Fellow (2019-21), Sir John
Walsh Research Institute



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=3149>

Dr Ian Towle's research interests are in using dental remains to understand how diet and behaviour has changed through primate, and especially human, evolution. He joined the SJWRI as the 2019 recipient of the Sir Thomas Sidey Postdoctoral Fellowship, awarded over two years. He completed his Fellowship in July 2021.

Dr Towle's previous research explored how dental wear differs among hominin species, and found that enamel properties heavily influence the formation of wear and fractures on the teeth surface. His postdoctoral fellowship project, working with Dr Carolina Loch, was titled 'An evolutionary perspective on dental properties, disease and wear'. Drs Towle and Loch have had several key articles published on dental tissue loss in fossil and living primates, and have recently submitted follow-up articles exploring how tooth mechanical and structural properties influence these patterns. By combining these methods, their research allows new insight into the evolution of the human dentition, but also through direct comparisons with living primates can provide ecological information on our fossil ancestors and relatives.

One of Towle and Loch's recent articles (2021) focused on chipping patterns across primate dentitions and highlighted that fossil humans have extremely high rates of tooth fracture, comparable with hard object eating living primates. In contrast, the pair's research has shown another group in our family, *Paranthropus*, has extremely low levels of fracture, suggesting a diet eating lots of tough vegetation is more likely the cause of them evolving very large back teeth. In two other articles Drs Towle and Loch showed that enamel properties vary across tooth crowns, and this links well with chipping patterns in primates. For example, the side of the tooth with most fractures is the side with the hardest enamel. Therefore, this shows that looking at mechanical and structural differences across tooth crowns may offer new insight into dental evolution but also help optimise dental implants.

Key publications 2019-2020

Towle, I., & Irish, J. D. (2020). Recording and interpreting enamel hypoplasia in samples from archaeological and palaeoanthropological contexts. *Journal of Archaeological Science*, 114, 105077. doi: 10.1016/j.jas.2020.105077

Towle, I. (2019). Tertiary dentine frequencies in extant great apes and fossil hominins. *Open Quaternary*, 5(2), 1-7. doi: 10.5334/oq.48

Towle, I., & Irish, J. D. (2019). A probable genetic origin for pitting enamel hypoplasia on the molars of *Paranthropus robustus*. *Journal of Human Evolution*, 129, 54-61. doi: 10.1016/j.jhevol.2019.01.002

Towle, I., Dove, E. R., Irish, J. D., & De Groote, I. (2017). Severe plane-form enamel hypoplasia in a dentition from Roman Britain. *Dental Anthropology*, 30(1), 16-24. doi: 10.26575/daj.v30i1

J. Neil Waddell

**MDipTech(Dent Tech)(TN) PhD
PGDipCDTech(Otago) HDE(UN)**

Professor, Department of Oral
Rehabilitation

Director, Biomaterials
Laboratory (from 2021)



<https://www.otago.ac.nz/sjwri/people/profile/index.html?id=252>

Professor Neil Waddell conducts experimental and observational research in dental materials, toughening of advanced ceramics, prosthodontic failure mechanisms and adhesion of dental restorations and materials, and intra-oral pressure dynamics, craniofacial biomechanics, subconcussive brain injury research, *in vitro* modelling of the effects of blunt force trauma to the head and accumulative damage to the brain, forensic biology and odontology, wounding and ballistic blood splatter analysis, and development of simulant materials for forensic modelling. Across 2019-20, he was lead or co-investigator on \$203,347 in new grants from funders including the NZDRF, Cure Kids, Lottery Health Research and the University of Otago, and was an author on 25 peer-reviewed publications. He supervised two postgraduate research students to completion, Huda Mohammed (DClinDent, 2019) and Vidya Mudliar (MDentTech, 2019). Key collaborations which underpin his current research are with the Department of Mechanical Engineering (University of Canterbury) investigating aerosol generation by different dental high-speed handpieces and ultrasonic scalers in terms of Covid-19 dental hazards; with the Faculty of Mechanical Engineering (Auckland) to develop real-time measurement of the denture mucosa pressure distribution in edentulous patients; with Callaghan Innovation on a MBIE-funded initiative led by Professor Warwick Duncan to develop an ultrasonic dental diagnostic device to improve the early diagnosis of gum disease around teeth and titanium dental implants; and with the Department of Anatomy (Otago), Department of Mechanical Engineering (Canterbury) and the Facharzt für Rechtsmedizin, Institut für Rechtsmedizin, Leipzig, Germany to investigate biomechanical properties of human skin/skull/brain system for the purpose of developing simulant materials and mathematical modelling systems.

Key publications 2019-2020

Jansen van Vuuren WA, Al-Amlah B, Alkharusi A, Dohan Z, Waddell JN, 2019. Surface Crack in Flexure versus the Vickers Indentation Method for calculating Fracture Toughness in two veneering porcelains. *NZ Dental Journal* Vol. 115 Issue 4, p151-156.

Jansen van Vuuren L, Broadbent JM, Duncan WJ, Waddell JN. 2019. Maximum voluntary bite force, occlusal contact points and associated stresses on posterior teeth. *Journal of the Royal Society of New Zealand*. 2019:1-12. DOI 10.1080/03036758.2019.1691612

Waddell JN, Deckhart I, Welge M, Ichim I, Swain MV. 2019. The influence of flame and furnace soldering method on the stress corrosion, fatigue resistance and fracture toughness of soldered bar attachment systems for implant overdentures. *Journal of the Royal Society of NZ*. 2019:1-17. DOI:10.1080/03036758.2019.1681478.

Lee JHC, Ondruschka B, Falland-Cheung L, Scholze M, Hammer N, Tong DC and Waddell JN. 2019. An investigation on the correlation between the mechanical properties of human skull bone, its geometry, microarchitectural properties, and water content., *J Healthc Eng.*, Vol 2019, Article ID 6515797, 8 pages. <https://doi.org/10.1155/2019/6515797>

Sir John Walsh Research Institute

Research Report 2019-2020

Appendix: Our achievements

SJWRI Research Report 2019-2020 Appendix: Our achievements

is now available for download from the
SJWRI website.

The 'Our Achievements' Appendix
document includes full listings of our:

Research publications

Research grants and contracts

PhD completions and thesis abstracts

*DClinDent completions and thesis
abstracts*

*Other postgraduate degree
completions*

for the 2019-2020 period.

To view or download a copy of the SJWRI
Research Report 2019-2020 Appendix,
please visit www.otago.ac.nz/sjwri.