Te Kaupeka Pūniho, New Zealand's National Centre for Dentistry, is the centre of excellence in New Zealand for clinical and translational research in dentistry and oral health. During 2015-16, the Clinical and Translational Research Programme was refreshed and relaunched, with an expanded focus to include Translational Research. The Research Programme groups together researchers and projects whose objective is to enhance care and achieve better outcomes for our patients. There is considerable overlap with other research programmes, particularly with respect to the translation from benchtop, in vitro and preclinical animal research into development of commercially-viable products or improvements in clinical practice.

Current projects range from clinical trials conducted within the school and out in the community of new products or modified treatment protocols, to development of new therapeutic agents and devices from benchtop through initial in vitro and preclinical animal trials with the objective of phase 1 clinical trials, to surveys conducted within the school or in the community regarding the techniques employed in clinical dental practice and their outcomes. Funding for this work ranges across contestable research grants, commercial sponsorship and contract research, and includes both researcher-initiated investigations and research driven by manufacturers of dental products.

The major part of Clinical and Translational research involves diverse projects undertaken by the staff, postgraduate and undergraduate students of the Faculty. Additionally, work has continued on the development of our dental practice-based research network, Applied Research through Clinicians' Hands (ARCH), with a view towards fostering research conducted outside the Faculty by and for New Zealand dental practitioners, with the support of Faculty of Dentistry staff.

Key personnel
Professor W Duncan
Professor P Brunton
Professor B Drummond
Professor D Tong
Associate Professor N Chandler
Associate Professor J Leichter
Associate Professor N Waddell
Associate Professor V Bennani
Associate Professor Tawse-Smith
Associate Professor L Foster-Page
Dr M Brosnan
Dr S Ma
Dr D Schwass
Dr D Coates
Dr T Milne
Dr C Loch Santos Da Silva
Dr B Al-Amieh
Dr J Choie
Ms D Boyd
Ms C Murray
Dr L Friedlander
Ms S Hanlin

Postgraduate students
Seung David Ko
Leonid Khimovich
James Dawson
Yevgeny Sheftel
Frances Ruddiman
Allauddin Siddiqi
Ajay Sharma
Noel Ye Naung
Janine Tiu
Syarida Safii
Joanne Choie
Soo-Wee Ong
Dr Andrew Tawse-Smith
Dr Sunyoung Ma

Research projects and themes established
Novel therapeutic agents
Manuka honey antibacterial action against caries – clinical trial
Manuka honey and Manuka oil antibacterial action against periodontitis – in vitro and clinical trial
Geranylgeraniol treatment for Bisphosphonate-Related Osteonecrosis of the Jaw (BRONJ) – in vitro and preclinical animal model
Novel grafting products for alveolar ridge preservation – clinical trial
Mucograft for gingival and mucosal regeneration – clinical trial
Novel bone grafting products and resorbable membranes for alveolar ridge preservation – preclinical animal model
Silver nanoparticles as antibacterial agents – in vitro
Silver nanoparticles in dental materials – in vitro
Silver nanoparticle topical gel for treating peri-implantitis and periodontitis – in vitro & preclinical animal model
Silver nanoparticle-doped bone xenografts for maxillofacial grafting – in vitro & preclinical animal model
Novel therapeutic approaches
HALL technique for childhood caries – clinical trial
Tooth preparation with ultrasonics – benchtop
Tooth preparation and restoration with ceramic materials – benchtop
Gingival retraction for dental impressions – clinical trial
Ultrasonic instrumentation of titanium – benchtop
Diode laser irradiation of titanium surfaces – benchtop
Novel bone-grafting surgical instruments – benchtop and cadaveric study

Implant therapy
Anodic modification of titanium and titanium-zirconia alloy – in vitro & preclinical animal model
Zirconia versus titanium one-piece implants – preclinical animal model & randomised clinical trial
Modified hydrophilic surfaces on dental implants – preclinical animal model

Stem cell therapy
Adipose-derived stem cell therapy around titanium implants – in vitro & preclinical animal model
Stem cells in dental pulp from deciduous teeth – in vitro
Oral periosteum-derived stem cells – in vitro

Outcomes of treatment
Outcomes of implant therapy in New Zealand private practice – clinical audit
Maxillary implant-supported overdentures – follow-up of randomised clinical trial
Mandibular implant-supported overdentures – follow-up of randomised clinical trial
Periodontal treatment: instrumentation of root surfaces – benchtop
Clinical success of zirconia implant abutments – follow-up of randomised clinical trial
Aftermarket versus original implant abutments – preclinical animal model
Perceptions of implant treatment – qualitative survey
Piezoelectric surgery vs rotary instruments for lateral maxillary sinus floor elevation – systematic review

Clinical audit
Referrals for Paediatric treatment – clinical audit
Dental files used for forensic identification – clinical audit
Dental treatment in New Zealand soldiers – clinical audit
Third molar extractions – clinical audit

Diagnostics
Oral pH and temperature – clinical trial
Ultrasonic devices for early diagnosis of periodontal diseases – benchtop, preclinical animal trial, clinical trial

Epidemiology of disease
Children and snoring – clinical survey
Caries in Māori – clinical survey
Use of Miswak by New Zealand Muslim immigrants – clinical survey
Titanium particles and peri-implantitis – clinical and histological survey
Quality assessment of systematic reviews on oral implants – systematic review

New Animal models
A sheep model of bilateral artificially-induced periodontal disease and periodontitis
A sheep model for testing bone grafting products in alveolar ridge preservation
A sheep model for testing bone grafting products in maxillary sinus elevation
A sheep model for testing modified titanium discs in the femoral epicondyle

Awards
• Associate Professor Nicholas Chandler received the Alan Docking International Association for Dental Research Science Award, 2016
• Dr Joanne Choi received 25 national and international media reports on her intra-oral pH and temperature device.
• Dr Sunyoung Ma won the SJWRI Publication Award (2015), was awarded 1st place for the Carl E Misch Award for Excellence in Implant Dentistry (2015) and was awarded the J. Morita Junior Investigator Award for Geriatric Oral Research (IADR, 2016).
• Associate Professor Vincent Bennani won the Faculty of Dentistry Research Day Poster Competition (2016).
• Dr Dawn Coates was awarded Faculty of Dentistry’s, Sir John Walsh Research Institute, Research Excellence Award in 2016.

Major grants
Professor W Duncan and co-investigators were awarded $1,199,869 by the Ministry of Business Innovation and Employment (High Value Manufacturing and Services – Targeted Research) for “UltraD3: Ultrasonic Dental Diagnostic Device” in 2015.
Professor W Duncan and co-investigators were awarded $999,804 by the Ministry of Business Innovation and Employment (Contestable Research Fund – Smart Ideas) for “Silverbone” – unique antibacterial biomaterial in 2016.

**Contestable Funding**
New Zealand Dental Research Foundation  
Faculty of Dentistry Fuller Grant  
New Zealand Dental Association/Ministry of Health Oral Health Research Grant.  
New Zealand Dental Association Research Foundation Project Grant  
Lottery Health Research  
International College of Dentists Research Fund  
Otago Innovation Ltd (OIL)  
University of Otago Research Grant  
Cure Kids, HRC  
DMG Germany  
Health Research Council of New Zealand  
Manuka Health New Zealand  
Maurice and Phyllis Paykel Trust  
New Zealand Society of Periodontology  
Division of Health Sciences Sandpit fund  
Wishbone Trust

**In-kind support**
Ivoclar International Co.  
Southern Implants  
Nobel Biocare  
Neoss  
Geistlich Pharma  
Zimmer Biomet 3i  
Resorba

**Patent applications**
D Schwass, C Meledandri, G Cotton (Antimicrobial alginate gel) 2015  
D Schwass, C Meledandri, G Cotton, W Duncan, G Tompkins (Silvergel) 2016

**Collaborations**
**Other Departments at Otago University:**
Applied Sciences Department, Clothing & Textile Sciences  
Geology Department  
Preventive & Social Medicine Department  
Physics Department  
Chemistry Department

**Other Universities**
Department of Mechanical Engineering, University of Auckland  
eveDENT (Australian PBRN)  
University of Western Australia  
University of Geneva, Switzerland  
Chonbuk University, Korea  
University of Zürich, Switzerland  
Swiss Federal Institute of Technology at Zürich, Switzerland

**Companies and other entities**
Callaghan Innovation (New Zealand)  
Southern Implants Ltd (South Africa)  
Zimmer Biomet 3i (United States of America)  
Resorba Medical GmbH (Germany)  
Ivoclar International (Liechtenstein)  
Geistlich Pharma (Switzerland)  
Molteno Ophthalmic Ltd (New Zealand)

**Undergraduate clinical research in 2015**
Ong, J.Z.T. Practices and philosophies towards vital pulp therapy: A PBRN Study  
Twaddle, N.J. Vital Pulp therapy practices in regional New Zealand  
Phang, J.; Sim, S.Y. Adolescents and young adults’ knowledge and understanding of dental trauma  
Tong, A.A.L.H. An audit of children and adolescents with medical problems including genetic anomalies and syndromes receiving care in the Paediatric Dentistry Clinic  
Jeganath, J.; Wong, A. New Zealand general dentists’ usage and views on caries detection methods  
Chow, M.; Costain, S. Knowledge, opinions and practices regarding sugar in oral paediatric medications: A survey of Dunedin pharmacies  
Eggleston, A.R.J.; Baker, L.C. Treatment needs and potential funding available for children referred for restorative dental care under general anaesthesia at the University of Otago School of Dentistry  
Lim, M.; Lin, R. Prescription of systemic antibiotics by dental specialists in New Zealand
Avau, P.S.; Jahnke, D.J. Oral health perceptions, awareness and preferences in a Dunedin Pacific population, New Zealand

Gatland, C.L.; Geoghegan, G.E. Strategies for the provision of oral health care for institutionalised older adults in New Zealand

Foo, M.; Kim, A.; Lee, D. Comparison of survival rates between single implant crowns (SIC) and short-span tooth-supported fixed bridges: 6-year retrospective study

Lin, T. Convergence angles and margin widths of tooth preparations prepared by New Zealand dental students

Campbell, H., Wilson, J. New Zealand dentist’s perspectives on whether recent NZ dental graduates are well equipped for the workforce

Singh, J.K.; Masri, N. Oral health status of New Zealand First World War service personnel

Nichols, G. Bicycle-related facial fractures over a 33-year period: have safety helmets made a difference?

Tan, A.P. Orthodontic screening and referral practices among dental therapists in New Zealand: A qualitative study

Kota, A.; Jayaweera, Y. The effect of standardised implantoplasty protocol on titanium surface roughness: an in-vitro study

Ee, S.J.; Tan, J.Y. Dimensional analysis of prosthetic screws supporting single implant crowns after 5 years in vivo

Undergraduate clinical research in 2016

Goh, K., Arrif, A. Current dental practice in New Zealand: anaesthesia, direct restorations, endodontics and bleaching

Hong, C.L. And Lamb, A. Medical emergencies and cross-infection control practices in New Zealand dental practices.

Looi, S., Chua, K.R. New Zealand general dental practitioners’ preferred methods and views regarding restoration of root canal treated teeth

Chew, D.W.S Tooth preparation with ultrasonic instruments. Effects on enamel and dentine surface bonding

Alayan, H., Fernandes, R. The use of miswak among Muslim immigrants living in New Zealand

France, A.J, Laqekoro Z. Pacific adolescents’ attitudes to and beliefs about oral health and oral health care

Radu A, Barber H. Presence of titanium particles in the oral mucosa of implants with peri-implantitis

Chuah, W.C. Quality evaluation of dental records in Forensic Odontology

Are Titanium wear particles associated with peri-implantitis? Images from Andrew Tawse-Smith’s PhD research showing micro brush sampling of the peri-implant mucosa
Featured publications

Book chapters


Journal publications


