

RESEARCH EXPERTISE

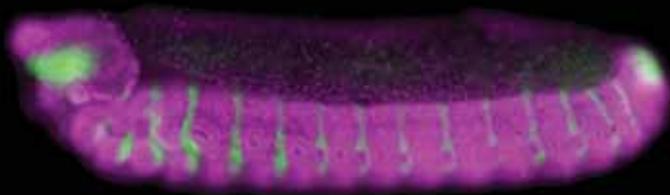
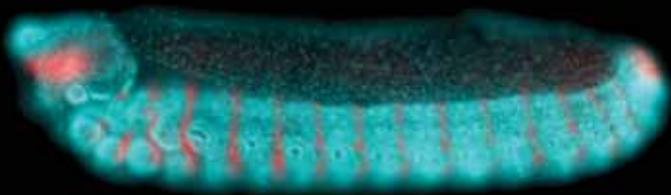
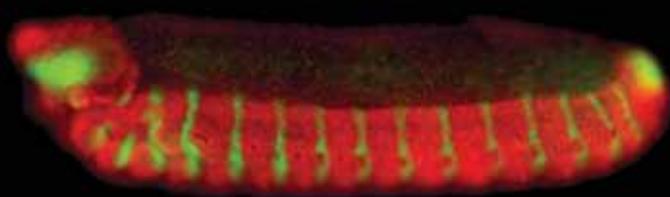
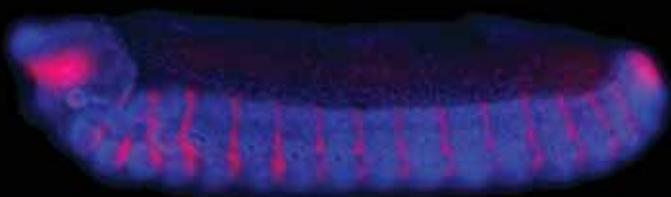


Image Associate: Professor Peter Dearden

## Letter from the Pro-Vice-Chancellor



The Division of Health Sciences at the University of Otago has an enviable reputation for research excellence and innovation. We are a large and vibrant Division spanning three campuses with research facilities in Dunedin, Christchurch and Wellington.

Our researchers are among the best of the best. They continually attract substantial funding in what is becoming an increasingly competitive environment. Over \$68 million of external funding was secured in 2010 alone. They are also frequently honoured with prestigious awards in recognition of their outstanding research contributions. The latest being Professor Warren Tate from the Department of Biochemistry, who was awarded the country's most prestigious science and technology honour, the Royal Society of New Zealand's Rutherford Medal. Our researchers were also honoured with the Royal Society's Pickering and Dame Joan Metge medals as well as the Health Research Council's Liley Medal.

Our researchers are increasingly applying their expertise to problems of high national and international relevance. Their ground-breaking research underpins many advances in health policy and practice and the understanding of health and disease. We have leaders in the fields of cancer genetics, mental health, neuroscience, infectious diseases, public health, Māori health, cardiovascular disease, reproductive and structural biology, and oral health.

The Division is proud to host a number of world-renowned research groups and centres including: the Centre for Neuroendocrinology, the Cardioendocrine Research Centre, the Cancer Genetics Laboratory, the Injury Prevention Research Unit, He Kainga Oranga – the Housing and Health Research Programme, the Webster Centre for Infectious Diseases, and the Dunedin Multidisciplinary Health and Development Research Unit.

As a Division we have an eye to the future. Our students can expect to be trained by academics and clinicians who are at the forefront of new knowledge, and to have access to the latest equipment and technologies. By investing wholeheartedly in research informed teaching, we believe that we are laying the foundations for the next generation of health research leaders in New Zealand.

This booklet provides a mere taste of the research being undertaken within the Division. I hope you find much of interest within its pages and I encourage you to contact us if you would like to know more.

Professor Peter Crompton  
PRO-VICE-CHANCELLOR HEALTH SCIENCES

## Outstanding Health Sciences Researchers

### Professor David Fergusson

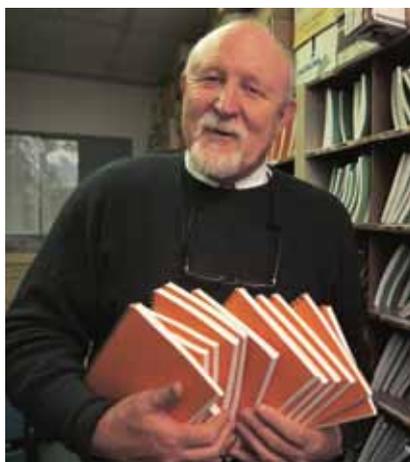
Department of Psychological Medicine  
University of Otago, Christchurch

World acclaimed human health and development expert Professor David Fergusson was the 2010 recipient of the University of Otago's highest research honour; the Distinguished Research Medal.

Professor Fergusson leads the highly acclaimed Christchurch Health and Development Study (CHDS), a study of a birth cohort of 1265 children born in Christchurch, and has done so for three-and-a-half decades. He and his team have an international reputation for their contributions to the health and well being of children, young people and their families.

His research has provided important new insights relating to areas such as early intervention for at-risk children, breastfeeding and IQ, cannabis use, domestic violence, abortion and mental health, suicidal behaviour, and the later mental health impacts of childhood sexual abuse. His research has contributed strongly to social and health development policy in New Zealand.

One of his notable insights has been that children from families facing multiple problems, stresses and difficulties have a greatly increased risk of developing severe behavioural problems later in life. From this he initiated Early Start and is now chairman and evaluator of the Christchurch-based family support programme.



### Associate Professor Richard Gearry

Department of Medicine  
University of Otago, Christchurch

Associate Professor Richard Gearry was awarded a University of Otago 2010 Early Career Award for Distinction in Research.

Associate Professor Gearry is an Associate Professor in the Department of Medicine and a consultant gastroenterologist at Christchurch Hospital. He has developed an active research programme in luminal gastroenterology, particularly inflammatory bowel disease (IBD) epidemiology, genetics, clinical outcomes and biomarkers.

Key research findings have included describing the very high incidence of Crohn's disease in Canterbury and the development of a validated population-based IBD cohort for genetic and clinical studies.

Other areas of research interest include; coeliac disease, irritable bowel syndrome and colorectal cancer.

Associate Professor Gearry is a member of the Genetics Otago group and collaborates widely with other groups within the University, New Zealand and internationally.

His research has resulted in 88 published papers in peer-reviewed journals and he has written two book chapters.



## Outstanding Health Sciences Researchers

### Professor Frank Griffin

Department of Microbiology and Immunology  
Otago School of Medical Sciences

Internationally renowned Professor Frank Griffin was the Royal Society of New Zealand's Pickering Medal recipient for 2010. This medal was awarded in recognition of his three-decades of research into animal health problems in deer. In particular it recognises the diagnostic tests and vaccines developed by Professor Griffin and his team for the detection and prevention of three major bacterial diseases in deer.

As Director of the Disease Research Laboratory at the University of Otago, Professor Griffin has undertaken research in collaboration with AgResearch, which has resulted in the development of laboratory techniques to diagnose TB in deer and Johne's disease in deer, sheep and cattle. These techniques are now widely used in the agricultural industry.

Professor Griffin's expertise in livestock diseases and their control is internationally recognised, and he has been sought by the Kruger National Park and the Royal Saudi Arabian Wildlife Commission to help combat the spread of bovine tuberculosis from buffalo to lions and other wildlife species.

His current research interests include the role that stress, modern farming practices and production play on immunity and disease resistance. A key aspect of his research explores how an individual's genetic makeup influences resistance and susceptibility to mycobacterial diseases.



### Professor Warren Tate

Department of Biochemistry  
Otago School of Medical Sciences

Professor Warren Tate was the 2010 recipient of New Zealand's premier science and technology honour, the Rutherford Medal. The award was made in recognition of his achievements in molecular biology and molecular neuroscience, as well as his generous support and mentoring of young researchers and his contributions to science policy both nationally and internationally.

A world-renowned molecular biologist, Professor Tate has made groundbreaking discoveries into the understanding of fundamental elements of cell biology. In particular, the understanding of the mechanisms by which proteins are synthesised in living cells.

Professor Tate has revealed how these mechanisms are altered in diseases such as HIV-1. This stemmed from his early career discovery of a new mechanism for gene regulation, frameshifting, spearheading a study of the mechanism in HIV-1 as a potential drug target.

Professor Tate's research has reached into the molecular mechanisms of mammalian memory and how they are impaired in human neurological diseases, particularly Alzheimer's. This has progressed to the development of a brain protein fragment that can restore memory, and has potential as a therapeutic agent for Alzheimer's disease.

In his most recent studies Professor Tate has begun to investigate the molecular biology underlying chronic fatigue syndrome.

Professor Tate's other achievements of note include the Alexander von Humboldt Fellowship, Pharmacia Research Prize and the Howard Hughes International Research Scholar Award. He has been made a Fellow of both the New Zealand Institute of Chemistry and the Royal Society of New Zealand.



## Selected Research Profiles

### Dr Andrew Clarkson

Department of Anatomy  
Otago School of Medical Sciences  
Department of Psychology  
University of Otago

Dr Andrew Clarkson's research focuses on post-stroke regeneration and repair mechanisms. His research is directed at promoting recovery of function following a stroke. The approaches used involve novel combinations of intensive rehabilitation, drug therapy and more recently stem cells to enhance brain repair processes. His work utilises behavioural, electrophysiological, optical imaging and anatomical measures to assess post-stroke repair and regeneration.

His recent paper in Nature explores a drug therapy with the potential to drastically improve the lives of stroke and head injury victims by unlocking paralysed arms and legs and restoring mobility by up to a half. Using a mouse model, Dr Clarkson and his colleagues found that the compound could re-activate neurons responsible for limb function, which had initially appeared to be dead or dormant after a stroke.

Dr Clarkson has returned to the University of Otago after working in the Department of Neurology at the University of California Los Angeles. His return was facilitated with a repatriation fellowship from the Neurological Foundation. He subsequently gained a four-year Sir Charles Hercus Health Research Fellowship and also a project grant from the Health Research Council.



### Professor Sunny (Catherine) Collings

Dean, University of Otago, Wellington

Professor Sunny Collings' research focuses on public health topics in mental health. She is Director of the Social Psychiatry and Population Mental Health Research Unit (SoPop). The Unit conducts research in the areas of mental health, mental illness and suicide prevention.

Recently her research investigated the efficacy and understanding of the Ministry of Health guidelines on the reporting of suicide amongst journalists, and the accessibility of suicide-related content on the Internet.

Another area of research interest explores how well those who are suffering from mental health problems are cared for in primary care and general practice settings. Professor Collings co-authored a report released from the Minister of Health's office showing that GPs and other primary health care professionals can provide effective care to people suffering from a wide range of mild to moderate common mental health conditions. She also led a team that has developed a new brief talking therapy for common mental health issues in primary care, that can be delivered by GPs and practice nurses. Other research interests include: suicide prevention, carers of people with mental disorders, and the social experience of people with mental disorders.



### Associate Professor Sarah Hook

School of Pharmacy

Associate Professor Sarah Hook's area of interest is in the development and testing (physical, chemical and immunological) of novel vaccine formulations for the prevention and treatment of both communicable and non-communicable diseases. Her specific areas of interest are in the development of one-shot sustained release vaccines and in needle-free (transdermal or oral) vaccines for the treatment of tuberculosis and cancer.

As one of the few researchers in the world who has both an understanding of the immunology of vaccination and the ability to develop novel vaccine formulations Associate Professor Hook has quickly become established in this area and has been very successful in attracting both competitive research funding and industry contracts. In the last 10 years she has been principal investigator or associate investigator on competitive research grants worth over \$7 million and has held industry contracts worth approximately \$500 000.

Associate Professor Hook has a number of national and international collaborations (UK, Denmark, Japan and Australia). The majority of her forty-five papers published since 2001 have been in the top pharmaceutical science journals as the senior author and group leader. She has been primary supervisor or co-supervisor for eleven PhD students who have gone on to post doctoral positions in academia and industry.



## Selected Research at University of Otago Health Sciences

Major Human Disease		
Area	Detail	Leading Researchers
<b>Cancer Biology Research</b>		
Cancer and Cancer Genetics	Stomach, colorectal, renal and prostate cancer; leukaemia, diagnostic markers for cancer; chromosome structure, genetic changes with neoplasia, apoptosis, tumour suppression, p53 protein, Wilms' Tumour; genomic imprinting	Antony Braithwaite, Mike Eccles, Tony Reeve, Brett Delahunt, Ian Morison, Bridget Robinson, Han Seung-Yoon, Parry Guilford, Christine Morris, Magnus Thorn, Julia Horsfield
Role of Antioxidants	Biological chemistry of free radicals, redox regulation of cell signalling, apoptosis, antioxidants and chemoprevention	Christine Winterbourn, Tony Kettle, Mark Hampton, Margreet Visser
<b>Cardiovascular Disease</b>		
Cardioendocrinology	Endocrinology, physiology, cardiology, biochemistry, neurohumoral factors, regulation of blood pressure, salt/water balance, heart failure	Mark Richards, Tim Yandle, Vicky Cameron, Miriam Rademaker, Richard Troughton, Chris Charles, Chris Pemberton
Vascular Biology	Vascular connective tissue biology, genetics, atherosclerosis, varicose veins, venous ulcers, surgical audit	Russell Scott, Andre van Rij, Rob Walker, Greg Jones, Sally McCormick, Ivan Sammut, Ged Wilkins, Ming Zhang
Cardiac Health and Disease	Heart attack, risk factors, advanced methods of diagnosis, therapy for ischemia, hypoxia, clinical pharmacology	Carl Burgess, Peter George, Stewart Mann, Cheuk-Kit Wong, John Elliott, Ivan Sammut
<b>Diabetes/Obesity and Renal Disease</b>		
Metabolism and Endocrinology	Obesity, insulin resistance, hormone disturbance in adolescence, metabolism of lipoproteins, energy homeostatic mechanisms	Dave Grattan, Jim Mann, Russell Scott, Barry Taylor, Patrick Manning, Greg Anderson, Wayne Sutherland, Chris Florkowski
Nutrition; Interventions	Effects of exercise, diet, public health campaigns, intervention studies	Jim Mann, Rachael Taylor, Kirsten McAuley, Louise Signal
Childhood Diabetes	Type 1 diabetes, obesity, complications, metabolic disorders	Barry Taylor, Brian Darlow, Tony Merriman, Russell Scott, Esko Wiltshire
Clinical Care	New treatments, obesity management, diet-control, HRT, inhaled insulin, lifestyle interventions	Patrick Manning, Russell Scott, Richard Stubbs, Helen Lunt, Bev Lawton, Kirsten Coppell, Kirsten McAuley, Rachael Taylor
Renal Health and Disease	Risk factors for renal failure, biomarkers, renal amyloidosis, renal dysphagia, ion channels, cancer	Rob Walker, Kevin Pringle, Stephen Brennan, Mike Eccles, Grant Butt, Fiona McDonald
<b>Respiratory Disease</b>		
Asthma	Exhaled NO, beta agonists, environmental triggers	Robin Taylor, Julian Crane, Kirstin Wickens, Carl Burgess, Rob Siebers
COPD	Airway inflammation, paediatric respiratory problems	Philip Pattemore, Mike Epton
<b>Autoimmune and Inflammatory Conditions</b>		
Autoimmune	Genetics of diabetes type 1, arthritis, gout, inflammatory bowel disease, crohn's disease, ankylosing spondylitis, inflammation in acute pancreatitis, sepsis and burns	Andrew Day, Tony Merriman, Bhatia Madhav, John Highton, Paul Hessian, Frank Frizelle, Will Taylor, Andrew Harrison, Richard Garry, Rebecca Roberts, Michael Schultz, Lisa Stamp
<b>Liver and Gastrointestinal Disorders</b>		
	Congenital disorders of liver and bile ducts, liver, gastric and pancreatic cancers, surgical interventions	Mark Stringer, John McCall, Richard Stubbs
<b>Oral Disease</b>		
Dentistry	Periodontal disease, endodontal disease, caries	Greg Seymour, Mary Cullinan, Robert Love, Bernadette Drummond, Anita Nolan
<b>Health Knowledge &amp; New Technologies</b>		
Area	Detail	Leading Researchers
Advanced Biological Technologies	Genomics, proteomics, gene expression and sequencing methodologies, structural biology, protein crystallography, bioinformatics, genetics, microarray technology, statistical computing, lenti virus technology, forensic sciences	Greg Cook, Steve Duffull, Mike Eccles, Neil Gemmill, David Green, Kurt Krause, Ian Morison, Tony Reeve, Clive Ronson, Stephen Robertson, Warren Tate, Jules Kieser, Iain Lamont, John Cutfield, Catherine Day, Peter Dearden, Sally McCormick, Russel Poulter, Mik Black, Liz Ledgerwood, Chris Brown, John Pearson, Stephanie Hughes
Reproductive and Developmental Biology	Pre-implantation development, fertility, IVF, male reproductive biology, congenital malformation in humans, insect development, mammalian genomics	Neil Gemmill, Dave Grattan, Helen Nicholson, David Green, Stephen Robertson, John Hutton, Mike Legge, John Evans, Peter Dearden
Pharmacology and Drug Discovery	Neuropharmacology, neurotoxicology, cardiovascular signalling, cardioprotection, drug resistance and drug metabolism, inflammation and wound healing, pharmacovigilance, pharmacogenetics, clinical impact of genetic variability, personalised medicine	Evan Begg, Carl Burgess, Paul Glue, Paul Smith, Murray Barclay, Cynthia Darlington, Martin Kennedy, Steve Kerr, David Reith, Rhonda Rosengren, Ivan Sammut, Yiwen Zheng, Greg Giles
Drug Formulation and Delivery	Biocompatible formulations, bioactivity, chemical and physical stability, neural networks, controlled release	Ian Tucker, Thomas Rades, Steve Duffull, Sarah Hook, Ivan Sammut, Paul Fawcett
Plant Health and Disease	Rhizobia, plant flowering, photosynthesis	Clive Ronson, Julian Eaton-Rye, Richard Macknight
Bioengineering	Biomaterials, tissue engineering, forensic dentistry, micro-mechanical properties of materials	Jules Kieser, Mike Swain, Tony Poole, Peter Sowerby, Tim Woodfield, Olaf Bork, George Dias, Anthony Butler
Bioethics	Ethics of research and new technologies, war crimes, reproductive technologies	Gareth Jones, Don Evans, Jing Bao-Nie, Grant Gillett, Neil Pickering
Biostatistics	Design and analysis of clinical trials, Bayesian methods	Steve Duffull, Richard Edwards, Peter Herbison, Shelia Williams, Chris Frampton, Elizabeth Wells

## Selected Research at University of Otago Health Sciences

Infectious Diseases		
Area	Detail	Leading Researchers
Vaccine Development	Anti Tb, H Pylori and ORF virus vaccines vs animal diseases, directing vaccines, anti-cancer vaccines, viral particles for vaccine delivery	Frank Griffin, Ian Tucker, Thomas Rades, Andy Mercer, Philip Bagshaw, Margaret Baird, Sarah Young, Sarah Hook, Marilyn Hibma, Alex McLellan, Vernon Ward
Microbiology and Microbial Molecular Genetics	Probiotics, antibiotic resistance, Candida, HIV, iron uptake, mycobacteria, biofilms, virology, gingivitis, biosensors, fermentation, biofuels, Listeriosis	Richard Cannon, Steve Chambers, Greg Cook, Andy Mercer, David Murdoch, Greg Seymour, Chris Sissons, John Tagg, Gerald Tannock, Warren Tate, Mary Cullinan, Iain Lamont, Vernon Ward, Brian Monk
Vaccines and Viruses in Cancer	Viruses as risk factors for breast cancer; immunity to HPV, anti-cancer vaccines	Justin Roake, Margaret Baird, Marilyn Hibma, Sarah Young, Kurt Krause
Epidemiology of Infectious Diseases	Meningococcal disease, HIV, climate change and disease, oral health, systemic disease from oral infection, Tb and PCV in developing countries	Philippa Howden-Chapman, Philip Hill, Charlotte Paul, Murray Thomson, Michael Baker, Nigel Dickson, Nick Wilson, David Murdoch, Steve Chambers
Public Interface of Health and Health Services		
Area	Detail	Leading Researchers
Cancer Control	Cancer prevention, epidemiology and screening, sun protection, tobacco control, multidisciplinary patient care, regulation of angiogenesis, and metastasis, pharmacology, clinical trials, cytogenetics, and child cancer care	David Skegg, Charlotte Paul, Peter Crampton, Tony Blakely, Frank Frizelle, Brian Cox, Rob McGee, Shelia Williams, Christine Morris, Bridget Robinson, Tony Reeder, Diana Sarfati
Youth Mental Health; Addiction; Suicide; Drug/Substance Abuse	Longitudinal studies, epidemiology, suicide prevention, cognitive psychology, risk factors for intentional injury, alcohol and drug abuse, smoking in Māori, adolescents and during pregnancy, anti-smoking campaigns, tobacco industry behaviour, health promotion	Richie Poulton, Sunny Collings, Pete Ellis, David Fergusson, Marie Crowe, Rob McGee, Doug Sellman, John Horwood, Shyamala Nada-Raja, Nick Wilson, George Thomson
Social and Economic Determinants of Health	Housing and health research, health inequalities and interventions, mental health, international health	Tony Blakely, Julian Crane, Philip Hill, Philippa Howden-Chapman, Sunny Collings, Louise Signal
Longitudinal Studies	Two cohorts of 1000 people have been studied from birth in the 1970s. All aspects of health and well-being are being assessed	Richie Poulton, David Fergusson, Murray Thomson, John Horwood, Jo Baxter
Oral Public Health	Paediatric dental health, dental health of older people, epidemiology of oral disease	Murray Thomson, Bernadette Drummond, Lyndie Foster-Page
Paediatrics	Neonatology, complications of prematurity, immunisation strategies, sleep disorders, SIDS, cystic fibrosis	Brian Darlow, Andrew Day, Barry Taylor, Marie Johannesson, Thorsten Stanley, Esko Wiltshire, Barbara Galland
Injury Prevention and Rehabilitation; Recreational Injury; Occupational Health	Injury prevention policy and practice, transportation injuries, occupational musculoskeletal and respiratory diseases, back pain, falls, stroke, epidemiological surveillance, psychological care and rehabilitation, aviation medicine, head injury, pregnancy/in-utero injury, outcomes of injury, fatigue	John Langley, Hank Weiss, Jennie Connor, David Baxter, John Campbell, Tim Anderson, Sarah Derrett, Colin Cryer, Clare Robertson, Richard Jones, Hilda Firth, Rob Griffiths, David McBride, Dorothy Begg, Leigh Hale, Steve Milosavljevic, Haxby Abbott, Markus Melloh, Lisa Whitehead
Health Services	Primary health care funding and organisation, rural health, clinical practice guidelines, health sector restructuring, waiting lists, health promotion, health economics, pharmacy practice, outcomes	Peter Crampton, Tony Dowell, Pauline Norris, Jim Reid, Les Toop, Robin Gauld, Richard Edwards, Susan Dovey, Garry Nixon, Derelie Mangin, Louise Signal, Rick Audas
Mental Health, Neuroscience, and Neurological Disorders		
Area	Detail	Leading Researchers
Depression, Mood Disorders and Psychiatric Illness	Psychiatric genetics, neurobiology, neuroendocrinology, bi-polar disorder, personality disorders, psychotherapy, psychopharmacology, abuse, epidemiology of mental disorders	Paul Glue, Peter Joyce, Roger Mulder, Pete Ellis, Sarah Romans, Suzanne Luty, Richard Porter, Janice McKenzie, Caroline Bell, Kate Scott, Sunny Collings
Neuroendocrinology	Neural regulation of fertility, gonadal steroids, adaptations of the maternal brain, dopamine neurons, prolactin, leptin and reproduction, GnRH & vasopressin neurons	Allan Herbison, Dave Grattan, Greg Anderson, Colin Brown, István Ábrahám, Christine Jasoni, Rebecca Campbell
Neurodegenerative and Balance Disorders	Parkinson's disease, cellular action of dopamine, anti-parkinsonian drug therapies, motor control pathways, sensory-motor and cognitive function, Alzheimer's disease, recovery from vestibular damage, ADHD	Tim Anderson, Warren Tate, Cliff Abraham, Ian McLennan, Paul Smith, Richard Jones, Brian Hyland, Cynthia Darlington, Richard Sainsbury, Ruth Empson
Memory and Learning	The molecular mechanisms of information storage, synaptic transmission, gene expression, dopamine and learning	Warren Tate, Cliff Abraham, Jeff Wickens, Joanna Williams, Ping Liu, John Reynolds
Primary Care and Service Delivery	Behavioural science, nursing, provision of care. See also Mental Health section above	Tony Dowell, Pauline Barnett, Pete Ellis, Marie Crowe
Rangahau Hauora Māori and Pacific Island Health Research		
Area	Detail	Leading Researchers
Māori Health	Mental health, social inequalities in health, sexual health, women's health, attitudes to new technologies, heart disease, inherited cancers, diabetes, gout	John Broughton, Jo Baxter, Bridget Robson, Suzanne Pitama, Bev Lawton, Ricci Harris, Matire Harwood, Donna Cormack
Pacific Island Health	Access to health services, medical education, cancer epidemiology, prescription patterns	Tai Sopoaga, Pauline Norris, Brian Cox, Rose Richards
Biological Anthropology		
Area	Detail	Leading Researchers
	Human anthropology, prehistoric health & disease, ancient DNA, human migration	Lisa Matisoo-Smith, Nancy Tayles, Hallie Buckley, Andrew Clarke

## Selected Research Profiles

### Professor David Murdoch Department of Pathology University of Otago, Christchurch

Professor David Murdoch is a clinical microbiologist, whose research focuses on the epidemiology, prevention and diagnosis of respiratory and invasive bacterial infections.

He is a lead investigator on the Pneumonia Etiology Research for Child Health (PERCH) study which aims to determine the causes of pneumonia, a disease that kills a child every 30 seconds. PERCH is funded by the Bill and Melinda Gates Foundation and is based in 7 developing countries in Africa and Asia. Through membership of the Pneumococcal Awareness Council of Experts (PACE) he is working internationally to meet the United Nations Millennium Development Goal of two-thirds reduction in mortality of children under the age of five.

Professor Murdoch also co-leads a research programme based in Nepal focusing on vaccine-preventable infections in children.

Other areas of research include infective endocarditis, for which he is a lead investigator of the largest ever study of this disease (over 5500 patients from 64 hospitals in 28 countries), the International Collaboration on Endocarditis (ICE).

Professor Murdoch is the Principal Investigator of VIDARIS (Vitamin D and Acute Respiratory Infection Study), investigating whether vitamin D supplementation decreases the incidence and/or severity of acute respiratory infections.



### Associate Professor Anita Nolan Faculty of Dentistry

As a young medical student, being mistaken for a dental student and asked to look into a patient's mouth became a turning point in Associate Professor Anita Nolan's career. This event continues to motivate her research as she looks for oral markers of systemic disease.

With collaboration from colleagues in Dentistry, Medicine and Science, she is researching the Oral Manifestations of Crohn's Disease as a predictive indicator and prognostic marker of Intestinal Crohn's Disease. Her preliminary research on Orofacial Granulomatosis demonstrated a trend towards an association with Crohn's susceptibility genes. These results could have significant implications for future management of Crohn's Disease, a chronic, incurable bowel disorder that is distressing for patients and in New Zealand costs the health service over \$58 million annually. This important national study genotyping Oral Crohn's Disease was awarded research grants by Otago Medical Research Fund, New Zealand Dental Association / Ministry of Health Fund and Lottery Health in 2010. The research has attracted international collaborations.

Associate Professor Nolan's other research interests include Sjogren's Syndrome. She recently completed UK / New Zealand research evaluating clinicians' attitudes to the condition. Her current research evaluates the prevalence and mechanism of oral damage caused by this condition.



### Professor Stephen Robertson Department of Women's and Children's Health Dunedin School of Medicine

Professor Stephen Robertson holds the Cure Kids Chair in Child Health Research. He is a paediatrician and clinical geneticist with a special interest in the genetic determinants of congenital malformations in humans and the ethical considerations of the clinical application of genetic knowledge.

Professor Robertson was awarded the Royal Society's 2010 Liley Medal for his research published in Nature Genetics which seriously questions current dogma that germline mutations in a tumour suppressor gene predispose to cancer. He has shown that the same genetic event, separated by only space and time, can have dramatically different outcomes. This paper is the fourth paper that Professor Robertson has had published in Nature Genetics.

His research is internationally recognised for its importance in understanding how genes encoding proteins called filamins are involved in the development of a broad range of structural abnormalities in children. This work has led to the evolution of the term "filaminopathies" as an umbrella term to describe all conditions caused by mutations in filamin genes.

His research is funded and supported by the Cure Kids, Lotteries Health, Health Research Council, and the Marsden Fund.



## Selected Research Profiles

### Dr Anthony (Tony) Schneiders School of Physiotherapy

Dr Tony Schneiders has strong clinical and research interests in sports and manipulative physiotherapy. He is the President of Sports Physiotherapy New Zealand and the representative to the International Federation of Sports Physical Therapy.

Dr Schneiders' most recent published research investigated visual acuity in motorsport athletes. These athletes proved to be statistically superior over a control group in the Perception Time Test which measured their ability to see objects that were only momentarily visible. Further research into the area of visual performance may lead the way to performance improvement and a reduction in injuries in motorsport athletes.

His other areas of research interest have a sports and manipulative physiotherapy focus. He is the leader of the Sport and Exercise Research Group which generates research in the area of exercise, health and sport relevant to the needs of New Zealand's diverse population.



### Professor Gerald Tannock Department of Microbiology and Immunology Otago School of Medical Sciences

Professor Gerald Tannock's research projects include the microbiology of inflammatory bowel diseases, the use of a unique colony of Lactobacillus-free mice and lactobacilli as model bacteria for investigating the molecular foundations of gut autochthony (ie which bacteria are normally found in the gut), engineering bowel bacterial communities by dietary manipulation, and the impact of bifidobacterial species and other bacteria on the prevalence of eczema.

Professor Tannock's contribution to research into the gastrointestinal microflora both nationally and internationally has spanned over thirty years. His recent research focuses on the microbiota present in the bowel of the young with a project aimed at demonstrating the importance of bifidobacteria to the early programming of our immune systems.

In 2000, his contributions to science and technology were recognised with a Royal Society of New Zealand Silver Medal, and in 2002 he was elected to Fellow of the American Academy of Microbiology, only the second New Zealander to receive this honour.

Professor Tannock has extensive collaborations with Crown Research Institutes, including AgResearch and Plant and Food Research and also with Fonterra.



### Dr Rachael Taylor Department of Medicine Dunedin School of Medicine

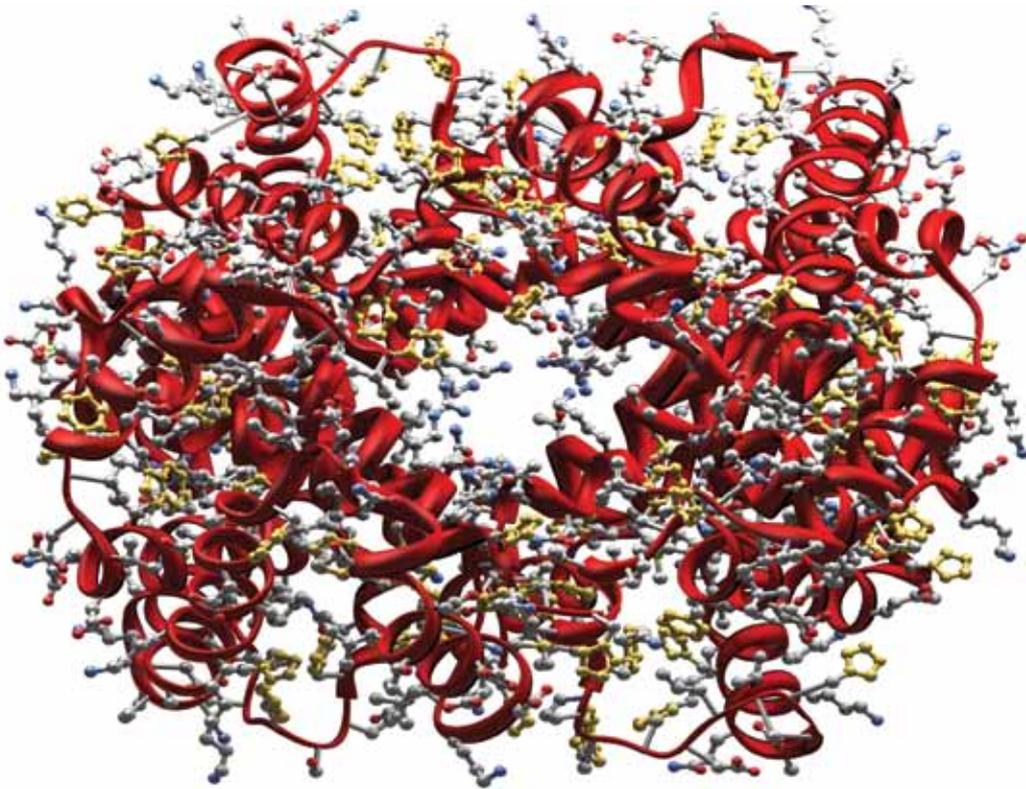
Dr Rachael Taylor is the Karitane Research Associate Professor in Early Childhood Obesity and is a member of the Edgar National Centre for Diabetes Research. Her research areas pertain to body composition and obesity during growth and particularly in developing sustainable effective interventions for the prevention and treatment of obesity in youngsters.

Her previous research includes the APPLE (A Pilot Programme for Lifestyle and Exercise) study, the first successful obesity prevention initiative in NZ primary school aged children, and FLAME (Family Lifestyle, Activity, Movement and Eating), which followed 240 children from three to seven years of age, investigating the influence of diet, physical activity and sleep on growth and body composition.

Current projects include POI (Prevention of Overweight in Infancy), an obesity prevention initiative starting from birth; MInT (Motivational Interviewing in Treatment), to determine how best to inform parents that their young child is overweight; PLAY, which alters school playgrounds to determine the effect on physical activity and health; and Healthy Homework, a 6-week healthy eating and activity plan for families.



## Recent Developments



### Successful Innovation in the Division

#### Anti-thrombotic Therapies

Christchurch campus-based pathology researcher Professor Steve Brennan won the 2009 Otago Innovation Proof of Concept Grant, with his anti-coagulant drug candidate. The grant gives Professor Brennan \$50,000 to further his work on the naturally occurring anti-coagulant protein, which has the potential to become a valuable addition to existing anti-thrombotic therapies. The Proof of Concept Grant aims to encourage researchers to think about the possible commercial applications of their work.

#### Hand-held Diagnostic Device

Research by Dr Jo-Ann Stanton's group in the Department of Anatomy aims to build a hand-held diagnostic device for use in human medicine. The device is intended to take a sample of blood, possibly no more than a pin-prick, and analyze it quickly and cheaply for a range of blood proteins and other substances. Hand-held diagnostic devices are widely expected to change the face of human medicine over the next decade or so, by providing much greater participation by the patient in the management of their own healthcare and wellness. This project has received six years of programme funding from FRST (now MOSI).

## Featured Research Centres in the Division



### GENETICS OTAGO

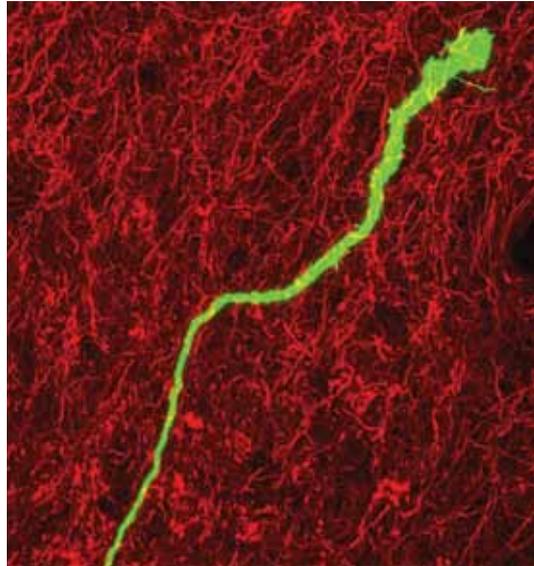
Director: Associate Professor Peter Dearden, Department of Biochemistry, Otago School of Medical Sciences

Website: [www.otago.ac.nz/genetics](http://www.otago.ac.nz/genetics)

Genetics Otago was officially launched in July 2009. It consists of a network of genetics researchers from throughout the University and is dedicated to promoting and supporting research in all fields of genetics, within Otago and beyond. Genetics Otago intends to establish itself as New Zealand's number one centre for advanced genetics research and teaching. The Centre already has over 100 members from across the University's Divisions of Health Sciences, Sciences, Humanities, as well as external organisations. The aims of the Centre are to:

- ~ Increase the profile of genetics research at Otago
- ~ Develop links with those involved in the area of genetic research within the University
- ~ Develop and promote linkages with external organisations, including those within the tertiary sector and Governmental agencies
- ~ Assist with the development of international linkages in relation to genetics research
- ~ Identify and promote research funding opportunities for genetics research
- ~ Contribute to working parties in order to develop major new initiatives

Research in the Centre covers the full spectrum of genetics research from the molecular level, to cells, embryos, organisms, populations and society. There are seven major themes including: evolution; development; human genetics; microbial genetics; genomics; applied genetics; and law, ethics and society.



### CENTRE FOR NEUROENDOCRINOLOGY

Directors: Professor Allan Herbison, Department of Physiology, Otago School of Medical Sciences, Professor Dave Grattan, Department of Anatomy, Otago School of Medical Sciences

Website: [www.otago.ac.nz/neuroendocrinology/](http://www.otago.ac.nz/neuroendocrinology/)

The Centre for Neuroendocrinology (CNE) comprises nine laboratories undertaking biomedical research aimed at unravelling the ways in which the endocrine and neural systems interact. The CNE is the largest neuroendocrinology cluster in the southern hemisphere focusing on how the brain controls reproduction.

Members of the CNE are leaders in cutting-edge neuroscience methodologies, ranging from molecular biology and transgenics to electrophysiological, morphological, cell imaging and in vivo approaches.

Studies extend from investigations into key neuronal cell types such as the gonadotropin-releasing hormone and oxytocin neurons, to research targeted at uncovering the multiple ways hormones such as prolactin and estrogen act back upon the brain to adapt its function to specific reproductive states. Other research in the CNE focuses on understanding the brain mechanisms controlling food intake, body fluid balance, and hormone responses to stress.

The overarching aim of research within the CNE is to bring forward fundamental biomedical insights that will enable the design of new therapies for use in the clinic.

## RESEARCH ENQUIRIES

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