

PhD OPPORTUNITIES

CHRISTCHURCH CAMPUS





University of Otago, Christchurch
Te Whāre Wananga o Otāgo ki Ōtautahi

PhD Opportunities on Christchurch Campus

Research interests
Potential topic areas
Supervisors

[last updated September 2017]

For information on regulations and requirements for PhD study through the University of Otago, see

www.otago.ac.nz/study/phd

For scholarships information, see

www.otago.ac.nz/study/scholarships

If you wish to apply for admission to PhD via Christchurch campus, contact
Ruth Helms, Manager Academic Programmes, Christchurch Campus

ruth.helms@otago.ac.nz

DEPARTMENT OF ANAESTHESIA

Pain medicine

Physiology

Pharmacology

Anaesthesia

Critical Care

CONTACTS

Prof Ted Shipton

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Claire Willis

Departmental Administrator

Department of Anaesthesia

University of Otago, Christchurch

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DEPARTMENT OF GENERAL PRACTICE

General Practice

Potential topics

- Prescribing education
- Antibiotic resistance in the community

CONTACT

Prof Les Toop

03 364 3604

les.toop@otago.ac.nz

Age and Ageing

1. Support of older people

Potential topics

- Big data – developing models to predict ageing
- Models of care in the community
- Health needs and health issues commonly experienced in older people
- Model of service delivery

2. Interprofessional development

Potential topics

- Health professional education
- Interdisciplinary approaches to research questions
- Application of mixed methods of research (qualitative and quantitative)

CONTACT

Dr Hamish Jamieson
Health Care of the Elderly
Burwood Hospital, Christchurch
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Canterbury Rheumatology and Immunology Research Group

Potential topics

- Management of gout and rheumatoid arthritis
- Pharmacology
- Granulomatous polyangiitis (GPA, previously Wegener's granulomatosis)
- Inflammatory mechanisms in rheumatoid arthritis

CONTACT

Prof Lisa Stamp
lisa.stamp@cdhb.health.nz

Christchurch Clinical Pharmacology Research Group

Potential topics

- Pharmacogenetics: of adverse drug reactions; of drug exposure; of drug response
- Pharmacokinetics: physiological based modeling; in clinical studies
- Pharmacoepidemiology: clinical questions addressed using a large regional data set, e.g., adverse drug reactions

CONTACT

A/Prof Matt Doogue
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DEPARTMENT OF MEDICINE continued

Education Research

Potential topic

- Health professional education

CONTACT

Prof Tim Wilkinson
tim.wilkinson@otago.ac.nz

Gastroenterology Research

Potential topics

- Inflammatory Bowel Disease
- Pharmacogenetics in inflammatory bowel disease
- Autoimmune liver disease
- Coeliac disease
- Colorectal cancer
- Irritable Bowel Syndrome
- Nutrition and gut health
- Nutrition

CONTACTS

Prof Richard Geary
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Dr Catherine Stedman
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Prof Andrew Day
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New Zealand Brain Research Institute

www.nzbri.org

1. Parkinson's and Related Disorders

We have some substantial projects underway in Parkinson's disease and other neurological disorders such as multiple sclerosis and Huntington's. Our research is conducted at a human behavioural and clinical level. Our methods include *brain imaging* (functional, structural, diffusion and perfusion MRI; metabolic and protein deposition PET), *movement measurement* (eye and hand tracking), and *neuropsychological assessment*. These projects have roles for students from diverse backgrounds, including psychology, neuroscience, physics, mathematics, statistics, and medicine.

Potential topics

- Progression in Parkinson's disease: evidence from serial eye movement, MRI, and cognitive assessment
- Freezing and falling in Parkinson's disease – who, why and what to do
- Multiple sclerosis – epidemiology and mechanisms
- Cerebral haemodynamic function in ageing and dementia
- Saccadic eye movements in health and in neurological disorders
- Adaptation of human saccadic eye movements
- Hand-eye coordination in real-world tasks.
- Mathematical modeling of neurological disease onset, incidence, and progression
- Brain imaging in other populations including very preterm birth, mild traumatic brain injury, etc.

2. Neurotechnology Group

www.neurotech.org.nz

Potential topics

- The phenomena of microsleeps and lapses in sustained attention
- Detection and prediction of microsleeps and attention lapses from electrophysiological signals
- Obstructive sleep apnea - treatment efficacy and adverse effects in the brain

CONTACTS

Prof Tim Anderson
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Dr Michael MacAskill
(movement)
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Dr Tracy Melzer
(brain imaging)
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Dr Toni Pitcher
(PD imaging and epidemiology)
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CONTACT

Prof Richard Jones
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DEPARTMENT OF MEDICINE continued

Respiratory Physiology Research Group

Potential topics

- Biomarkers in Pulmonary Artery Hypertension
- Energy consumption in COPD
- Management of pneumothorax
- Beta-blocker in COPD

CONTACT

Prof Lutz Beckert
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Christchurch Heart Institute

www.otago.ac.nz/chcheart

1. Physiology

Potential topics

- Novel therapeutic agents for heart failure
- Physiology of novel vasoactive peptides
- Models of cardiac injury
- Vasoactive hormones and sympathetic interactions
- Cardiac sympathetic nerve activity in heart disease

CONTACTS

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A/Prof David Jardine
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2. Clinical Research

Potential topics

- Ventricular remodelling after myocardial infarction
- Hormone-guided treatment of heart failure
- Bioactivity of "new" vasoactive hormones

CONTACTS

Prof Mark Richards
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Prof Richard Troughton
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Dr John Lainchbury
john.lainchbury@otago.ac.nz

DEPARTMENT OF MEDICINE continued

Christchurch Heart Institute (cont)

3. Translational Biodiscovery Lab

Potential topics

- Identification of new circulating peptides: their biological activity and diagnostic applications
- Effect of hormones on, and their responses to, bone growth
- Biochemical and metabolic studies of BNP related peptides and their measurement in cardiovascular disorders
- Studies of vasoactive hormones in isolated perfused hearts
- Cytokine signalling, neurohormones and intracellular signalling pathways in experimental myocardial infarction
- The role of hormones regulating metabolism in cardiovascular disease
- Neurohormonal aspects of cardiovascular disease - clinical studies
- Neurohormonal aspects of cardiovascular disease - laboratory studies

CONTACTS

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A/Prof Tim Yandle

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Prof Mark Richards

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4. Molecular Biology and Genetics

Potential topics

- Genetics/Genomics, Epigenetics and Heart Disease in the New Zealand Population
- Circulating Noncoding RNAs in Heart Disease
- Proteomics of Heart Disease

CONTACTS

Prof Vicky Cameron

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Dr Anna Pilbrow

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Dr Allamanda Faatoese

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Dr Moritz Lassé

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5. Heart Disease

Potential topics

- Trends in management and outcomes of unstable angina and myocardial infarction
 - development of prospective audit/database
 - comparison with other New Zealand and Australian centres
- Have priority scores improved elective treatment of heart disease?
- Effects of chronic heart disease on quality of life

CONTACT

Dr John Elliott

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CENTRE FOR POSTGRADUATE NURSING STUDIES

www.otago.ac.nz/christchurch/departments/nursing

Management of Long-Term Conditions

Potential Topics

- Quality of life for people with chronic health needs
- Development of nursing roles in chronic disease management
- Research with older people
- Mental health/Psychological therapies
- Family centered care
- Healthcare and ageing population
- Advanced aged assisted living and rest home care
- Self-management for long-term conditions with older adults
- Pain management
- Parents of children with long term respiratory conditions
- Pacific Island populations

CONTACTS

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Dr Virginia Jones

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Dr Philippa Seaton

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Prof Marie Crowe

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Dr Henrietta Trip

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Intellectual or Learning Disability

Potential Topics

- Body image of women with intellectual disability
- Sexuality and sexual health of people with Intellectual Disability
- People with intellectual disability negotiating the legal system
- Advanced care planning for people with life limiting conditions
- Parents with intellectual disability
- Primary health care for people with intellectual disability
- Mental health of people with intellectual disability

CONTACTS

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Dr Jenny Conder

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Dr Henrietta Trip

henrietta.trip@otago.ac.nz

Women's Health

Potential Topics

- Cultural norms and wellbeing
- Hormone replacement therapy and ageing
- Self-management for long-term conditions with older adults
- Gender health impacts

CONTACT

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Dr Sandra Richardson

sandra.richardson@otago.ac.nz

Emergency Medicine and Acute Care Nursing Practice

Potential Topics

- Emergency Department nursing
- Natural disasters impact on health and nursing practice
- Hospital-community interface
- High acuity nursing

CONTACT

Dr Sandra Richardson
sandra.richardson@otago.ac.nz

Family Centred Care

Potential Topics

- Family centred care within paediatrics
- Implementation of family centred care within health care settings
- Chronic respiratory disease
- Supportive care
- Families with children with Intellectual or physical disability

CONTACTS

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Dr Jenny Conder
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Dr Henrietta Trip
henrietta.trip@otago.ac.nz

Mental Health

Potential Topics

- Improving clinical outcomes
- Psychosocial interventions for bipolar disorder
- Interventions for mood disorders
- Translating research into practice
- Psychosocial interventions in an inpatient setting

CONTACT

Prof Marie Crowe
marie.crowe@otago.ac.nz

Health Leadership

Potential Topics

- Quality systems and management
- Risk management
- Health service leadership and management
- Socio political aspects of nursing

CONTACTS

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Dr Philippa Seaton
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Dr Sandra Richardson
sandra.richardson@otago.ac.nz

Health Services delivery

Potential Topics

- Nursing workforce
- Care delivery modes
- Innovation in health care
- Improving clinical outcomes
- Health Technology

CONTACTS

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Dr Sandra Richardson

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Health Professional Education

Potential Topics

- Technology enhanced learning and teaching (TELT)
- Inter-professional education
- Simulation
- Teaching practice

CONTACTS

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Dr Sandra Richardson

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Health Leadership

Potential Topics

- Quality systems and management
- Risk management
- Health service leadership and management
- Socio political aspects of nursing

CONTACTS

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Dr Philippa Seaton

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Dr Sandra Richardson

sandra.richardson@otago.ac.nz

Nursing Practice

Potential Topics

- Advanced nursing practice
- Ethics
- Cultural safety and diversity
- Socio-political issues and nursing
- Preceptorship/mentorship

CONTACTS

Prof Marie Crowe

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Dr Jenny Conder

jenny.conder@otago.ac.nz

Dr Henrietta Trip

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Laboratory for Cell and Protein Regulation

Potential topics

- Gynaecological cancers and the influence of hypoxia and modulation by food compounds
- The intersection of Nanoscience and Biology, and mechanotransduction (modulation of cell function by physical forces)

CONTACTS

A/Prof Peter Sykes
03 364 4630
peter.sykes@otago.ac.nz

Gynaecological Cancer Research Group

Potential topics

- The Detections and / or Management of cervical precancerous lesions
- Dietary compounds and ovarian cancer
- Targeted drugs in advanced ovarian cancer
- Ovarian cancer cell models in vivo and possible drug targets

CONTACTS

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Dr Kenny Chitcholtan
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DEPARTMENT OF ORTHOPAEDIC SURGERY AND MUSCULOSKELETAL MEDICINE

Christchurch Regenerative Medicine and Tissue Engineering (CReaTE) Group

www.otago.ac.nz/christchurch/research/create

www.otago.ac.nz/bioengineering/christchurch

www.bioengineering.otago.ac.nz/create

1. Translational Tissue Engineering & Regenerative Medicine Research

Potential topics

- Translational Regenerative Medicine strategies for cartilage and bone repair
- 3D Biofabrication of osteochondral tissue engineered constructs for joint resurfacing
- 3D Printing of nano-composite scaffolds for bone regeneration
- Bio-assembly of organotypic 3D tissue models
- In vivo evaluation of Additive Manufactured custom titanium orthopaedic implants
- Optimising mesenchymal stem cell niche for musculoskeletal regenerative medicine
- *In vitro* 3D culture models for mimicking native tissue organisation *in vivo*
- Spectral (MARS) micro-CT imaging of cartilage and bone health

CONTACTS

A/Prof Tim Woodfield
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Prof Gary Hooper
gary.hooper@otago.ac.nz

Dr Khoon Lim
khoon.lim@otago.ac.nz

2. Orthopaedic medical devices

Potential topics

- Additive manufacturing of porous scaffolds for stimulating bone formation
- Optimisation of the implant-bone interface for stimulating bone formation
- *In vivo* models for optimised medical device design
- Total joint replacement and clinical outcomes

CONTACTS

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Dr Khoon Lim
khoon.lim@otago.ac.nz

DEPARTMENT OF ORTHOPAEDIC SURGERY AND MUSCULOSKELETAL MEDICINE cont

Christchurch Regenerative Medicine and Tissue Engineering (CReaTE) Group (cont)

3. Advanced 3D Printing and bio-fabrication

Potential topics

- Translational Regenerative Medicine strategies for cartilage and bone repair
- 3D Biofabrication of osteochondral tissue engineered constructs for joint resurfacing
- 3D Printing of nano-composite scaffolds for bone regeneration
- Bio-assembly of organotypic 3D tissue models
- In vivo evaluation of Additive Manufactured custom titanium orthopaedic implants
- Optimising mesenchymal stem cell niche for musculoskeletal regenerative medicine
- *In vitro* 3D culture models for mimicking native tissue organisation *in vivo*
- Spectral (MARS) micro-CT imaging of cartilage and bone health

CONTACTS

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Prof Gary Hooper

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Dr Khoon Lim

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Clinical Orthopaedic Research

Potential topics

- Acoustic emission monitoring for detecting wear/failure in total joint replacement
- Joint proprioception following total joint replacement
- Measuring changes in bone mineral density in total hip and knee arthroplasty
- Random controlled trials evaluating total joint arthroplasty and survival
- Prospective studies evaluating total joint arthroplasty and survival from the New Zealand National Joint Registry
- Prediction of outcomes following hip and knee joint replacement

CONTACTS

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Dr Jennifer Dunn

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DEPARTMENT OF ORTHOPAEDIC SURGERY AND MUSCULOSKELETAL MEDICINE cont.

Pain Research

Potential topics

- Clinical outcomes following major joint surgery, particularly examining factors associated with poor functional outcomes and/or post-surgical chronic pain (prospective studies)
- Chronic pain coping strategies and decisions associated with using strategies in daily life
- Mindfulness and positive psychology approaches to living with chronic pain
- Factors associated with resilience and living with persistent pain
- Experience of living with chronic pain (for example osteoarthritis, fibromyalgia)
- Clinical practice change and knowledge translation from theory to clinical practice in pain and pain management

CONTACT

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Dr John Alchin
John.alchin@otago.ac.nz

PATHOLOGY AND BIOMEDICAL SCIENCE

Centre for Free Radical Research

www.otago.ac.nz/christchurch/research/freeradical

1. Potential topics

- Redox regulation of cell signalling
- Cell death pathways in cancer and immune cells
- Oxidative stress and mitochondrial dysfunction in ageing and disease
- Peroxiredoxins as antioxidants and signalling proteins
- Anti-cancer and anti-inflammatory properties of isothiocyanates
- Neutrophil function

CONTACT

Prof Mark Hampton
03 378 6225
mark.hampton@otago.ac.nz

2. Potential topics

- Radical reactions with superoxide
- The role of free radicals and chlorine bleach in inflammatory diseases
- Bacterial killing by neutrophils
- The enzymology of peroxidases
- Identification of biomarkers of hypochlorous acid

CONTACT

Prof Tony Kettle
03 364 0577
tony.kettle@otago.ac.nz

3. Potential topics

Projects for cell biology, biochemistry or genetics students, and for medical students, or nutrition students:

- Understanding the role of vitamin C in cancer biology, using cell culture models, animal models of breast cancer and glioma, and human clinical studies. We are investigating the mechanism of action and potential interactions with chemotherapy and radiation, using any and all of the above methods.
- The effects of optimal micronutrient intake on human health and immunity. Of particular interest is the capacity of vitamin C in preserving neutrophil immune cell function.
- Understanding the role of vitamin C in the regulation of the 2-oxoglutarate-dependent dioxygenases that control the hypoxic response and many epigenetic processes. These projects involve cell biology and genetics methodologies

CONTACT

Prof Margreet Vissers
03 364 0577
margreet.vissers@otago.ac.nz

4. Potential topics

Translational 'bench to bedside' research:

- Role of vitamin C in pneumonia and sepsis (observational studies and clinical trials)
- Role of vitamin C in neutrophil function (laboratory-based and interventional studies)

CONTACT

Dr Anitra Carr
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PATHOLOGY AND BIOMEDICAL SCIENCE continued

Gene Structure and Function Laboratory

www.otago.ac.nz/christchurch/research/genestructure

Potential topics

- Pharmacogenomics and genomics
- Genetics of disease and complex traits
- Role of G-quadruplex DNA structures in biological processes

CONTACT

Prof Martin Kennedy
martin.kennedy@otago.ac.nz

Inflammation Research Group

www.otago.ac.nz/christchurch/research/inflammation

Potential topics

- Gas Mediators in Inflammation
- Neurogenic Inflammation in Acute Pancreatitis, Sepsis, and Burns
- Chemokines in Acute Pancreatitis, Sepsis, and Burns
- Apoptosis of Pancreatic Acinar Cells

CONTACT

Prof Madhav Bhatia
madhav.bhatia@otago.ac.nz

Infectious Diseases and Microbiology

Potential topics

- Pneumonia and other respiratory infection
- Legionnaires' disease
- Vitamin D and infection
- Staphylococcus aureus disease
- Leprosy in the Pacific

CONTACTS

Prof Steve Chambers
steve.chambers@otago.ac.nz

Prof David Murdoch
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A new focus is on identifying micro-organisms in situ with antibody directed contrast targeting

CONTACTS

Prof Anthony Butler
anthony@butler.co.nz

Prof Stephen Chambers
steve.chambers@otago.ac.nz

Mackenzie Cancer Research Group

www.otago.ac.nz/mackenzie-cancer

1. Potential topics

- Obesity, chemotherapy and breast cancer
- Exercise and breast cancer
- Inflammation and cancer
- Immune response in non-melanoma skin cancers
- Immunotherapy and immune related adverse events in melanoma

Background: cancer, cell biology, molecular biology, chemotherapy, genetics

CONTACTS

Dr Margaret Currie

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Prof Bridget Robinson

bridget.robinson@cdhb.health.nz

2. Potential topics

- Genetic variation and cancer development
- Gene expression and tumour development

Background: cancer, molecular biology, genomics, genetics

CONTACTS

Dr Logan Walker

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Prof Bridget Robinson

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3. Potential topics

- Vitamin C in cancer
- Vitamin C status of cancer patients
- Changes in cancer metabolome and proteome by vitamin C supplementation
- Tracking tumour response using MARS imaging
- Hypoxia, HIF-1 and cancer therapy

Background: cancer, cell biology, biochemistry, molecular biology

CONTACTS

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Prof Bridget Robinson

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Prof Margreet Vissers

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Prof Anthony Butler

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PATHOLOGY AND BIOMEDICAL SCIENCE continued

Coagulation and Vascular Disease

Background: molecular, biochemistry, genetics

CONTACT

Prof Peter George
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Molecular Pathology

Potential topics

- Genetic and acquired abnormalities of blood proteins
- Protein structure, function and disease
- The contribution of post translational changes to disease
- Fibrinogen variation and disease; bleeding, thrombosis, hepatitis and renal failure
- Protein imprinting; novel protein biomarkers of disease; Serum albumin and Apo AI as time resolved markers of pancreatitis

CONTACT

Prof Stephen Brennan
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PAEDIATRICS AND PAEDIATRIC SURGERY

Paediatric Gastroenterology

Potential topics

- Inflammatory Bowel Disease
- Host:pathogen interactions in the gut
- Intestinal epithelial cell responses
- Coeliac disease
- Nutrition

CONTACT

Prof Andrew Day
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Paediatric Infectious Diseases

Potential topics

- Infections in children
- Childhood vaccination

CONTACT

Dr Tony Walls
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Paediatric Respiratory Diseases

Potential topics

- Asthma epidemiology
- Cystic fibrosis diagnosis - diagnostic test performance and prediction

CONTACT

A/Prof Philip Pattemore
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Paediatric Surgery

Potential topics

- Validation of 3D printed thoroscopic model of surgical expertise in oesophageal atresia repair

CONTACT

Prof Spencer Beasley
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DEPARTMENT OF POPULATION HEALTH

Social determinants of health
Social policy
Vulnerable Populations
Qualitative and mixed method approaches

CONTACT

A/Prof Gillian Abel
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Communicable diseases epidemiology and policy
Environmental health policy

CONTACT

Dr Cheryl Brunton
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Evidence-based practice
Patient safety and quality improvement
Systematic reviews / meta-analysis
Health services research
Epidemiological

CONTACT

Dr Phil Hider
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Bayesian modelling
Causal inference
Institutional performance comparisons
Bayesian data mining in pharmacovigilance

CONTACT

Dr John Pearson
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Health economics
Alcohol and drugs
Survey methods

CONTACT

Dr Ian Sheerin
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DEPARTMENT OF POPULATION HEALTH continued

Health professionals and interprofessional boundaries

Critical approaches to public health and health promotion

Pleasure and public health

Electronic cigarettes

Qualitative methods

CONTACT

Dr Lee Thompson

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Population health interventions

Clinical trials

Statistical methods

CONTACT

Dr Jonathan Williman

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DEPARTMENT OF PSYCHOLOGICAL MEDICINE

Addiction and co-existing disorders

Potential topics

- Prevention and treatment of alcohol and other substance use disorder
- Addictive overeating
- Behavioural addictions including gambling, sex and electronic media addictions
- Politics of alcohol and other drugs
- Medicinal cannabis
- Personality and addiction

CONTACTS

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Anxiety disorders and treatment

CONTACTS

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Cognitive impairment and mood disorders

Neurocognitive interventions

CONTACTS

Prof Richard Porter
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Dr Katie Douglas
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Eating disorders

Obesity

CONTACTS

A/Prof Lois Surgenor
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Dr Jenny Jordan
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Longitudinal health and social outcomes

Potential topics

- Developmental antecedents of mental health and addiction problems in adulthood
- Adult sequelae of childhood illness and adversity
- Interactions between social factors, life events and mental health outcomes

CONTACT

A/Prof Joe Boden
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DEPARTMENT OF PSYCHOLOGICAL MEDICINE continued

Maori Mental Health

CONTACT

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Personality disorders and treatment

CONTACTS

Prof Roger Mulder
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Dr Dave Carlyle
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Physical - Mental health interface

CONTACTS

Prof Roger Mulder
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Dr Cameron Lacey
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Psychiatric pharmacogenetics

Potential topics

- Genetic predictors of psychiatric medication side effects
- Personalised prescribing for psychiatric disorders

CONTACT

Dr James Foulds
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Psychological adaptation to medical illness

Psychological aspects of cancer

CONTACT

A/Prof Lois Surgenor
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Psychotherapy for mood disorders

CONTACTS

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Dr Jenny Jordan
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Dr Maree Inder
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DEPARTMENT OF PSYCHOLOGICAL MEDICINE continued

Psychotherapy for mood disorders

Interpersonal psychotherapy

Perinatal psychiatry

Infant mental health

CONTACT

A/Prof Sue Luty

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DEPARTMENT OF RADIOLOGY

Topics related to:

- Spectral imaging (MARS imaging)
- Spectral imaging of breast and ovarian cancer cell models in vivo with nanoparticles and possible drug targets
- Fracture risk assessment and treatment monitoring of osteoporosis using MARS
- Cardiovascular and atheroma Imaging
- Image reconstruction
- X-ray detector physics and scanner design
- X-ray dosimetry
- Medical data visualisation
- Virtual Reality in Medicine
- Computer Aided Diagnosis and Image Processing
- MRI, Computed Tomography, and Ultrasound

The department has a range of radiology projects from basic imaging science to clinical studies. The department also hosts the bioengineering lab with projects in mechatronics, radiological software systems, and x-ray detector systems.

A major theme in the department is the development of 3D spectral x-ray imaging. As part of the project we are studying the underlying imaging technology such as energy selective photon processing detectors, construction of scanners, image recovery and computed tomography routines, image enhancement and material decomposition. The department uses small-bore scanners for this research and is in the development phase of building a human capable scanner for clinical trials

Clinically focused spectral x-ray projects include research into cardiovascular disease, cancer, bone health and nano-particle drug delivery.

CONTACTS

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DEPARTMENT OF SURGERY

Potential topics

- Early onset colorectal cancer
- Gut bacteria and colorectal cancer
- Host iron status and gastrointestinal disease
- Biomarkers and **gastrointestinal disease**

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Potential topics

- Epidemiological studies of colorectal cancer in New Zealand
- Outcomes of Colorectal cancer in New Zealand
- Diverticular disease in Canterbury; patterns of presentation, predictors of recurrence and outcomes from surgery including quality of life.
- Epidemiological and outcome study of anal cancer

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