



## CSC-NZ CRCC Joint Funding Programme 2018-19 NCD

### Summary of NCD research proposals and supervisors

Reference	Proposal title	PhD	Visiting scholars and postdoc	Supervisor(s)
<b>University of Auckland</b>				
NCD, 2019-01	Placental extracellular vesicles and the pathogenesis of preeclampsia	YES	YES	Prof Larry Chamley <a href="mailto:l.chamley@auckland.ac.nz">l.chamley@auckland.ac.nz</a> Dr Qi Chen <a href="mailto:q.chen@auckland.ac.nz">q.chen@auckland.ac.nz</a>
NCD, 2019-02	Physiologically-based pharmacokinetic (PBPK) modelling for drugs treating high blood pressure	YES	NO	Dr Harvey Ho <a href="mailto:harvey.ho@auckland.ac.nz">harvey.ho@auckland.ac.nz</a>
NCD, 2019-03	Green space and adolescent wellbeing	YES	NO	Associate Professor Melody Smith <a href="mailto:melody.smith@auckland.ac.nz">melody.smith@auckland.ac.nz</a>
NCD, 2019-04	The impact of migration and culture on relationships between neighbourhood environments, health behaviours, and body size in children of Chinese ethnicity	NO	YES	Associate Professor Melody Smith <a href="mailto:melody.smith@auckland.ac.nz">melody.smith@auckland.ac.nz</a>
<b>Auckland University of Technology</b>				
NCD, 2019-05	Spermine/Spermidine Acetyltransferase as therapeutic target for diastolic heart failure in Streptozotocin-induced diabetic rat model	YES	NO	Associate Professor Jun Lu <a href="mailto:jun.lu@aut.ac.nz">jun.lu@aut.ac.nz</a>

University of Otago				
NCD, 2019-06	Tai chi for older people with chronic musculoskeletal pain	YES	NO	Professor G David Baxter <a href="mailto:david.baxter@otago.ac.nz">david.baxter@otago.ac.nz</a>  Dr Lizhou Liu <a href="mailto:lizhou.liu@otago.ac.nz">lizhou.liu@otago.ac.nz</a>
NCD, 2019-07	Non-Pharmacological Modulation of the Autonomic Nervous System and the Neuroendocrine System to Complement Inflammation and Healing.	YES	NO	Associate Professor Steve Tumilty <a href="mailto:steve.tumilty@otago.ac.nz">steve.tumilty@otago.ac.nz</a>  Professor G David Baxter <a href="mailto:david.baxter@otago.ac.nz">david.baxter@otago.ac.nz</a>  Dr Lizhou Liu <a href="mailto:lizhou.liu@otago.ac.nz">lizhou.liu@otago.ac.nz</a>
NCD, 2019-08	Detection of gene-environment interactions contributing to the risk of gout in large European and Chinese sample sets	YES	YES	Professor Tony Merriman <a href="mailto:tony.merriman@otago.ac.nz">tony.merriman@otago.ac.nz</a>
NCD, 2019-09	A blessing or a curse - What is the role of open source diabetes technology in childhood type 1 diabetes?	YES	YES	Associate Professor Ben Wheeler <a href="mailto:ben.wheeler@otago.ac.nz">ben.wheeler@otago.ac.nz</a>
NCD, 2019-10	Epigenetic profiling to understand and predict response of lung cancer patients to immunotherapy treatment	YES	YES	Professor Michael Eccles <a href="mailto:michael.eccles@otago.ac.nz">michael.eccles@otago.ac.nz</a>  Dr Aniruddha Chatterjee <a href="mailto:aniruddha.chatterjee@otago.ac.nz">aniruddha.chatterjee@otago.ac.nz</a>
NCD, 2019-11	Circulating tumour DNA in paediatric and other cancers	YES	YES	Professor Parry Guilford <a href="mailto:parry.guilford@otago.ac.nz">parry.guilford@otago.ac.nz</a>
NCD, 2019-12	Chemical tools to study cannabinoid type 1 receptor	YES	NO	Dr Andrea Vernall <a href="mailto:andrea.vernall@otago.ac.nz">andrea.vernall@otago.ac.nz</a>
NCD, 2019-13	Effect of Carbohydrate Restriction Weight Gain, Glycaemia and Pregnancy Outcomes in Chinese women with Gestational Diabetes.	YES	YES	Associate Professor Jeremy Krebs <a href="mailto:jeremy.krebs@otago.ac.nz">jeremy.krebs@otago.ac.nz</a>  Dr Rosemary Hall <a href="mailto:rosemary.hall@otago.ac.nz">rosemary.hall@otago.ac.nz</a>

NCD, 2019-14	Influence of Body Composition on Effect of Very Low Calorie Diet or Exercise in people with Pre-Diabetes.	YES	YES	Associate Professor Jeremy Krebs <a href="mailto:jeremy.krebs@otago.ac.nz">jeremy.krebs@otago.ac.nz</a> Dr Rosemary Hall <a href="mailto:rosemary.hall@otago.ac.nz">rosemary.hall@otago.ac.nz</a>
NCD, 2019-15	Pathological behaviour in sensory processing in children at-risk for developmental dyslexia POST DOC/Visiting scholar or PhD	YES	YES	Dr Hunter Hatfield <a href="mailto:hunter.hatfield@otago.ac.nz">hunter.hatfield@otago.ac.nz</a>
NCD, 2019-16	Arginine metabolism and neurodegenerative and psychiatric disorders	YES	YES	Associate Professor Ping Liu <a href="mailto:ping.liu@otago.ac.nz">ping.liu@otago.ac.nz</a>
NCD, 2019-17	Internet of Things for Study of Child Obesity	YES	NO	Associate Professor Dr Zhiyi <a href="mailto:hzy@cs.otago.ac.nz">hzy@cs.otago.ac.nz</a> Dr Haibo Zhang <a href="mailto:haibo@cs.otago.ac.nz">haibo@cs.otago.ac.nz</a> Professor Rachael Taylor <a href="mailto:rachael.taylor@otago.ac.nz">rachael.taylor@otago.ac.nz</a>

2019-01:

## Placental extracellular vesicles and the pathogenesis of preeclampsia

<b>Supervisors</b>	Prof Larry Chamley and Dr Qi Chen
<b>Department</b>	Obstetrics & Gynaecology
<b>School / Centre</b>	School of medicine, Faculty of Medical and Health Sciences
<b>University</b>	The University of Auckland
<b>Email</b>	<a href="mailto:g.chen@auckland.ac.nz">g.chen@auckland.ac.nz</a> <a href="mailto:l.chamley@auckland.ac.nz">l.chamley@auckland.ac.nz</a>
<b>Project outline</b>	<p>Placental extracellular vesicles are lipid-enclosed packages of cellular contents (proteins RNAs) that are used by the human fetus to adapt the maternal physiology in normal pregnancy. In preeclampsia the content of the vesicles is altered and the maternal immune and vascular systems do not adapt correctly to pregnancy. We have found that placental extracellular vesicles are targeted to specific maternal organs (the lungs liver and kidneys) in normal pregnancy and change vascular tone in resistance blood vessels. We are currently investigating whether mistargeting of vesicles contributes to pregnancy diseases like preeclampsia. We are also investigating whether vesicles from preeclamptic pregnancies cause blood vessels to contract leading to the hypertension of this disease. This project will investigate the molecules that are present on placental extracellular vesicles that target the vesicles to specific maternal organs and whether these molecules are altered in preeclampsia.</p>
<b>References</b>	<p>Tong et al (2017) In vivo targets of human placental micro-vesicles vary with exposure time and pregnancy. <i>Reproduction</i>;153(6):835-845</p> <p>Tong et al (2017) Micro- and Nano-vesicles from First Trimester Human Placentae Carry Flt-1 and Levels Are Increased in Severe Preeclampsia. <i>Front Endocrinol (Lausanne)</i>. 24;8:174</p> <p>Xiao et al (2017) Treating normal early gestation placentae with preeclamptic sera produces extracellular micro and nano vesicles that activate endothelial cells. <i>J Reprod Immunol</i>. 2017 Apr;120:34-41</p>
<b>NCD CRCC priority area</b>	Maternal cardiovascular disease
<b>Supervisor's current research links with China</b>	<p>Our group has long term collaboration with The Hospital of Obstetrics and Gynecology, Fudan University, Wuxi Women's Hospital and First Affiliated Hospital of Xi'an Jiaotong University since 2007. This collaboration results in two to three medical doctors/researchers come to our department to participate a number of projects every year. We also jointly applied a number of research grants in China or in New Zealand. This collaboration generated more than 30 publications.</p>

2019-02:

## Physiologically-based pharmacokinetic (PBPK) modelling for drugs treating high blood pressure

<b>Supervisors</b>	Dr Harvey Ho, Dr David Nickerson and Prof Peter Hunter
<b>School / Centre</b>	Auckland Bioengineering Institute
<b>University</b>	The University of Auckland
<b>Email</b>	<a href="mailto:harvey.ho@auckland.ac.nz">harvey.ho@auckland.ac.nz</a>
<b>Supervisor's research page</b>	<a href="https://unidirectory.auckland.ac.nz/profile/hwe001">https://unidirectory.auckland.ac.nz/profile/hwe001</a>
<b>Project outline</b>	<p>The value of Physiologically-based pharmacokinetic (PBPK) models for the prediction of absorption, distribution, metabolism, and excretion (ADME) of drugs in humans has been well recognized. The PBPK principles and theories have also been established. However, there is still a large gap between <i>in vivo</i> measurements associated with ADME properties and their PBPK parameters (such as clearance rates, tissue partition coefficient, etc), which hinders the validation of PBPK models and their translation into clinical and/or pharmaceutical applications. The aim of this PhD study is to combine the expertise and data of two NZ and China institutions, and to build PBPK models for drugs treating high blood pressure. At first we will use Enalapril as the test drug, and to model its ADME properties such as the time course of its absorption in the gut, its metabolism in the liver, and its excretion via the bile duct or the kidney. The results will then be validated from <i>in vivo</i> and <i>in vitro</i> drug absorption experiments performed in Beagle dogs at the Agricultural Biopharmaceutical Laboratory (ABL) of the Qingdao Agricultural University.</p> <p>After the first PBPK model for Enalapril is constructed and validated, we will apply the principle to more drugs treating high blood pressure, including Chinese herbs which are being studied in ABL. The PhD project will make a number of novel contributions to the pharmaceutical properties of drugs due to the collaboration between the Auckland Bioengineering Institute (ABI) and ABL. For example, we will use the 3D modelling techniques of ABI to delineate the anatomy of Beagle dogs based on the 3D MRI image scans already available in ABL. The developed PBPK models can in return be used in ABL for its Biopharmaceutical Classification System project.</p>
<b>NCD CRCC priority area</b>	Cardiovascular diseases
<b>Supervisor's current research links with China</b>	The supervisor Dr H. Ho has built a collaboration with Prof Zhihui Hao of ABL. They have recently published a research paper "Quantification of <i>in vivo</i> gastric fluid volume in Bama miniature pigs in fasted state" in the journal <i>Biopharmaceutics &amp; Drug Disposition</i> (In press, 2018). The proposed PhD project will deepen this connection and generate significant research outputs in PBPK models.

2019-03:

## Green space and adolescent wellbeing

<b>Supervisors</b>	Associate Prof Melody Smith (nee Oliver), Dr Jinfeng Zhao and Dr Suzanne Mavoa
<b>Department</b>	Faculty of Health and Environmental Sciences
<b>School / Centre</b>	School of Nursing
<b>University</b>	The University of Auckland
<b>Email contact address</b>	<a href="mailto:melody.smith@auckland.ac.nz">melody.smith@auckland.ac.nz</a>
<b>Link to Supervisor's research page</b>	<a href="https://unidirectory.auckland.ac.nz/profile/melody-smith">https://unidirectory.auckland.ac.nz/profile/melody-smith</a> <a href="https://www.researchgate.net/profile/Melody_Smith11">https://www.researchgate.net/profile/Melody_Smith11</a> <a href="http://kidsinthecity.ac.nz/?page_id=219">http://kidsinthecity.ac.nz/?page_id=219</a>
<b>Project outline</b>	<p>Physical activity is essential for optimal health and development, and is associated with significant reductions in risk of non-communicable disease risk. In particular, activity of a moderate-to-vigorous intensity (MVPA) has a protective effect on diabetes and obesity risk. Built environment interventions and design are increasingly seen as fundamental to shifting the global increase in obesity, through sustained and prevalent impact on physical activity.</p> <p>Adolescence is a life stage of particular importance with regard to physical activity promotion – international evidence suggests a marked decline in activity at this stage, and tracking of activity levels into adulthood. Early intervention is imperative to encourage greater levels of activity for current and future health.</p> <p>In this research we propose to utilise data from the Youth'12 survey to understand links between the built environment (with a focus on green space) and adolescent activity and health outcomes in Chinese youth living in New Zealand and China. Chinese comprise 4% of the New Zealand population and in 2015/16 were the largest source of permanent migrants to the country (18%). In total, 463 youth identified as being of Chinese ethnicity in the New Zealand Youth'12 survey. The survey is extremely detailed, with over 600 questions. Information on activity, neighbourhood perceptions, health, time in New Zealand, and acculturation were gathered, providing a rich dataset to examine in the first instance. Thereafter, qualitative work is proposed to examine differences for Chinese adolescent youth living in China and New Zealand and to expand on quantitative findings observed.</p> <p>This PhD will make a valuable contribution by examining factors specific to youth who identify as Chinese, from the perspective of long-term residents, and new migrants. Data will be drawn from the existing dataset, as well as additional data collection to examine environmental and cultural factors related to optimal health outcomes for Chinese youth.</p>

<b>References</b>	<a href="https://www.fmhs.auckland.ac.nz/assets/fmhs/faculty/ahrg/docs/2012prevalence-tables-report.pdf">https://www.fmhs.auckland.ac.nz/assets/fmhs/faculty/ahrg/docs/2012prevalence-tables-report.pdf</a> <a href="https://www.fmhs.auckland.ac.nz/assets/fmhs/faculty/ahrg/docs/Chinese%20Trends_graphic_final.pdf">https://www.fmhs.auckland.ac.nz/assets/fmhs/faculty/ahrg/docs/Chinese%20Trends_graphic_final.pdf</a>
<b>NCD CRCC priority area</b>	Diabetes and obesity
<b>Supervisor's current research links with China</b>	<p>The significant and growing Chinese population in New Zealand presents unique opportunities and challenges from a public health perspective. Extending our research into the Chinese context through this PhD will be invaluable in terms of teasing out the underlying cultural factors that can impact health across extremely different environments.</p> <p>The supervisors have a strong interest in developing research links with China. They have been working with Dr Mei Lui, of Shanghai University to investigate opportunities for replicating the Neighbourhoods for Active Kids study methods in Shanghai (for which a postdoctoral fellowship is currently being sought).</p> <p>A/Professor Smith may also draw on networks through the Worldwide Universities Network (of which The University of Auckland is a member) to generate further meaningful collaborations with researchers in China. She has demonstrated success in this approach, including a recent successful Worldwide Universities Grant application with researchers from Sheffield University, the University of Sydney, Zhejiang University (China) and the University of Hong Kong titled "Hidden Voices: Exploring the Health Experiences of Children who Migrate."</p>

**2019-04:**

**The impact of migration and culture on relationships between neighbourhood environments, health behaviours, and body size in children of Chinese ethnicity**

<b>Supervisors</b>	Associate Prof Melody Smith (nee Oliver), Dr Jinfeng Zhao and Dr Mei Lui
<b>Department</b>	Faculty of Health and Environmental Sciences
<b>School / Centre</b>	School of Nursing
<b>University</b>	The University of Auckland
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<b>Supervisor's research page</b>	<a href="https://unidirectory.auckland.ac.nz/profile/melody-smith">https://unidirectory.auckland.ac.nz/profile/melody-smith</a> <a href="https://www.researchgate.net/profile/Melody_Smith11">https://www.researchgate.net/profile/Melody_Smith11</a> <a href="http://kidsinthecity.ac.nz/?page_id=219">http://kidsinthecity.ac.nz/?page_id=219</a>
<b>Project outline</b>	<p>Childhood obesity has increased to epidemic proportions globally. New Zealand has the third highest prevalence of childhood obesity in the OECD. Built environment interventions and design are increasingly seen as fundamental to shifting the global increase in obesity, through sustained and prevalent impact on physical activity and healthy eating practices.</p> <p>Neighbourhoods for Active Kids is a world-leading project investigating links between the neighbourhood environment, physical activity, nutrition, and body size in over 1100 school children (10% Chinese) in Auckland, New Zealand. The research team, led by A/Professor Smith comprises leading international researchers in children's physical activity, independent mobility, nutrition, and neighbourhood environments. Dr Judy Lin also has specialist expertise in acculturation, cultural continuity, and new migrant experiences of Chinese living in New Zealand and elsewhere.</p> <p>Our research has already demonstrated important links between the built environment and health for the full sample. Emerging findings suggest ethnic differences between children's physical activity behaviours and neighbourhoods. Unique activity behaviours and relationships with their neighbourhood environment have been observed with new migrant children. Chinese comprise 4% of the New Zealand population and in 2015/16 were the largest source of permanent migrants to the country (18%).</p> <p>There is now a need to explore the issue of ethnicity and the impact of culture on activity behaviours, links with their neighbourhood environments, and body size outcomes for children of Chinese ethnicity in order to ensure optimal outcomes for this group.</p> <p>This POST-DOCTORAL FELLOWSHIP will make a valuable contribution by examining factors specific to children who identify as Chinese, from the perspective of long-term residents, and new migrants. Data will be drawn from the existing dataset, as well as additional data collection to examine environmental and cultural factors related to optimal health outcomes for</p>



	Chinese children. There is a paucity of comparable research in the Chinese context and there will be the opportunity to expand the existing research to China through the established link with Dr Mei Lui of Shanghai University.
<b>References</b>	Oliver M, McPhee J, Carroll P, Ikeda E, Mavoa S, Mackay L, Kearns RA, Kytä M, Asiasiga L, Garrett N, Lin J, Mackett R, Zinn C, Moewaka Barnes H, Egli V, Prendergast K, Witten K. (2016). Neighbourhoods for Active Kids: Study protocol for a cross-sectional examination of neighbourhood features and children's physical activity, active travel, independent mobility, and body size. <i>BMJ Open</i> , 6(8), e013377, doi:10.1136/bmjopen-2016-013377
<b>NCD CRCC priority area</b>	Diabetes and obesity
<b>Supervisor's current research links with China</b>	<p>The significant and growing Chinese population in New Zealand presents unique opportunities and challenges from a public health perspective. Extending our research into the Chinese context and partnering with Chinese colleagues through this Post-doctoral Fellowship will be invaluable in terms of teasing out the underlying cultural factors that can impact health across extremely different environments. Research in this field has predominantly arisen from Hong Kong (e.g., Lam &amp; Loo, 2014, Determinants of Children's Independent Mobility in Hong Kong, <i>Asian Transport Studies</i>, 3(2), 250-260. The University of Hong Kong).</p> <p>The supervisors have a strong interest in developing research links with China. They have been working with Dr Mei Lui, of Shanghai University to investigate opportunities for replicating the Neighbourhoods for Active Kids study methods in Shanghai.</p> <p>A/Professor Smith may also draw on networks through the Worldwide Universities Network (of which The University of Auckland is a member) to generate further meaningful collaborations with researchers in China. She has demonstrated success in this approach, including a recent successful Worldwide Universities Grant application with researchers from Sheffield University, the University of Sydney, Zhejiang University (China) and the University of Hong Kong titled "Hidden Voices: Exploring the Health Experiences of Children who Migrate."</p>

**2019-05:**

## **Spermine/Spermidine Acetyltransferase as therapeutic target for diastolic heart failure in Streptozotocin-induced diabetic rat model**

<b>Supervisor</b>	Associate Prof Jun Lu
<b>Department</b>	School of Science
<b>School / Centre</b>	Faculty of Health and Environmental Sciences
<b>University</b>	Auckland University of Technology
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<b>Project outline</b>	<p>Diabetic heart failure develops in most of diabetic patients and its development is independent of ischemic heart disease and hypertension. Currently, this condition is the most common (&gt;50%) type of heart failure worldwide including New Zealand. Metabolic alterations in diabetes are closely associated with diabetic heart failure. Polyamine metabolism may influence such metabolic changes. As the polyamine metabolism has previously been shown to have implications in various complications of diabetes mellitus, we propose that the induction of the rate limiting enzyme of polyamine metabolism (Spermine/Spermidine Acetyltransferase - SSAT) may provide a unique, novel treatment approach for diabetic heart failure. It is also important to find an effective treatment for diabetes related heart failure, because the underlying mechanism for this condition is entirely different from the non-diabetic heart failure, thus the routine treatment of heart failure could be ineffective. We have planned current project to study the therapeutic effect of three SSAT inducers in a diabetic rat model, which have been previously shown as good experimental model of diabetes related heart failure.</p>
<b>References</b>	<p>Jell, J., Merali, S., Hensen, M. L., Mazurchuk, R., Spornyak, J. A., Diegelman, P., et al. (2007). Genetically altered expression of spermidine/spermine N1-acetyltransferase affects fat metabolism in mice via acetyl-CoA. <i>Journal of Biological Chemistry</i>, 282(11), 8404-8413.</p> <p>Liu, C., Perez-Leal, O., Barrero, C., Zahedi, K., Soleimani, M., Porter, C., et al. (2014). Modulation of polyamine metabolic flux in adipose tissue alters the accumulation of body fat by affecting glucose homeostasis. <i>Amino Acids</i>, 46(3), 701-715. doi: 10.1007/s00726-013-1548-3</p> <p>Lu, J. (2010). Triethylenetetramine pharmacology and its clinical applications. <i>Molecular Cancer Therapeutics</i>, 9(9), 2458-2467.</p> <p>Lu, J., Li, M., Pontre, B., Pickup, S., Phillips, A., &amp; Cooper, G. J. S. (2012, 5-12 May). SSAT inducer as a potential treatment for obesity-related heart failure. Paper presented at the International Society for Magnetic Resonance in Medicine 20th Scientific Meeting &amp; Exhibition, Melbourne, Australia.</p>

	<p>Pirinen, E., Kuulasmaa, T., Pietila, M., Heikkinen, S., Tusa, M., Itkonen, P., et al. (2007). Enhanced polyamine catabolism alters homeostatic control of white adipose tissue mass, energy expenditure, and glucose metabolism. <i>Molecular &amp; Cellular Biology</i>, 27(13), 4953-4967.</p> <p>Wang, Z. V., &amp; Hill, J. A. (2015). Diabetic Cardiomyopathy: Catabolism Driving Metabolism. <i>Circulation</i>. doi: 10.1161/circulationaha.115.015357</p>
<b>NCD CRCC priority area</b>	Cardiovascular diseases, diabetes and obesity
<b>Supervisor's current research links with China</b>	Dr. Jun Lu have existing collaboration with Fudan University, Shanghai Normal University, East China Normal University, Shenzhen University, Nanchang University, Xinjiang University and Shaanxi Normal University.

2019-06:

## Tai chi for older people with chronic musculoskeletal pain

<b>Supervisors</b>	Prof G David Baxter and Dr Lizhou Liu
<b>Department</b>	Centre for Health, Activity, and Rehabilitation Research
<b>School / Centre</b>	School of Physiotherapy
<b>University</b>	University of Otago
<b>Email</b>	<a href="mailto:david.baxter@otago.ac.nz">david.baxter@otago.ac.nz</a> <a href="mailto:lizhou.liu@otago.ac.nz">lizhou.liu@otago.ac.nz</a>
<b>Supervisor's research page</b>	<a href="https://www.otago.ac.nz/physio/about/people/academic/profile/?id=327">https://www.otago.ac.nz/physio/about/people/academic/profile/?id=327</a>
<b>Project outline</b>	<p>With increasingly ageing populations in New Zealand and China, chronic musculoskeletal pain has become a major health problem in both countries. While Complementary and Alternative Medicine has shown favorable effects in the management of chronic musculoskeletal pain, tai chi, an ancient exercise therapy, is receiving increasing interest from both the public and professionals to address physical frailty. However, consistent evidence on its effectiveness has yet to be established due to a lack of high-quality clinical studies. In order to address the research gap, we aim to conduct a randomized controlled trial to evaluate the effectiveness of tai chi for managing chronic musculoskeletal pain in communities in both New Zealand and in China.</p> <p>This study will be an international clinical trial with two research centers (New Zealand and China). The successful PhD student will be based in the New Zealand research center after he/she enrolls at the University of Otago. The trial conducted in New Zealand will be a pragmatic feasibility study with one-year observational period. Clinical outcomes will be collected to assess the potential effectiveness of tai chi, and focus groups will be conducted to provide qualitative evidence of acceptability of tai chi offered as a group intervention in the New Zealand population.</p>
<b>NCD CRCC priority area</b>	Modernization of traditional Chinese medicine Age-related diseases
<b>Supervisor's current research links with China</b>	Professor Baxter and Dr Liu have established intense research links with Professor Yong Tang and Dr Haiyan Yin, at the Acupuncture & Tuina School, Chengdu University of Traditional Chinese Medicine. Research collaboration between the two parties has been evidenced in co-supervision of a PhD student (Huijuan Tan, enrolled in the University of Otago in March 2018) and two co-publications (submitted to peer-reviewed journals in April and August 2018). With reference to this proposed project, Dr Yin has been awarded a research grant (60,000\$NZ) from the Department of Science and Technology of Sichuan Province, with Professor Baxter and Dr Liu are co-investigators.

2019-07:

## Non-Pharmacological Modulation of the Autonomic Nervous System and the Neuroendocrine System to Complement Inflammation and Healing

<b>Supervisors</b>	Associate Prof Steve Tumilty, Prof G David Baxter and Dr Lizhou Liu
<b>Department</b>	Centre for Health, Activity, and Rehabilitation Research
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<b>Email</b>	<a href="mailto:steve.tumilty@otago.ac.nz">steve.tumilty@otago.ac.nz</a> <a href="mailto:david.baxter@otago.ac.nz">david.baxter@otago.ac.nz</a> <a href="mailto:lizhou.liu@otago.ac.nz">lizhou.liu@otago.ac.nz</a>
<b>Supervisor's research page</b>	<a href="https://www.otago.ac.nz/physio/about/people/academic/profile/?id=1137">https://www.otago.ac.nz/physio/about/people/academic/profile/?id=1137</a>
<b>Project outline</b>	<p>Degenerative musculoskeletal diseases are common health problems in New Zealand and China, and are expected to increase in prevalence with aging populations. The autonomic nervous system and hypothalamic-pituitary-adrenal axis have been shown to be dysfunctional in a number of disorders, such as osteoarthritis, and tendinopathy. When an individual is presented with pain, the hypothalamus coordinates the stress response by activation of the neuro-endocrine system or stress axis. Further, the end products of the stress axis activation have been shown to modulate several immune parameters, thereby playing an important role in inflammation and tissue healing. The trend towards individualized medicine and issues around polypharmacy as well as pain medication issues has led towards an increasing popularity of drug free interventions such as acupuncture and spinal manipulation (Tuina) to restore the autonomic system balance and subsequently have an effect on pain and healing via modulation of endocrine and physiological processes. The student will study the mechanisms of effects of acupuncture and tuina using physiological measures such as blood flow and salivary hormone analysis, as well as clinical measures of pain and function to gain a better understanding of the systemic effects and clinical effectiveness of these interventions. This study will be a pragmatic observational trial investigating the use of acupuncture, tuina, and acupuncture with tuina on a degenerative musculoskeletal disorder, with one-year observational period. Historical contexts, literature reviews and consultation with Chinese clinical professions will guide the research design and methodology of this study.</p>
<b>NCD CRCC priority area</b>	Modernisation of traditional Chinese medicine Age related Diseases

<b>Supervisor's current research links with China</b>	<p>The supervisors of this project have established research links with the Acupuncture &amp; Tuina School at the Chengdu University of Traditional Chinese Medicine (CUTCM); specifically for this project, Professor Yong Tang. The common research interests between the two parties lie in the modernization of traditional Chinese medicine including acupuncture, and Tuina. As a part of the collaboration events between the University of Otago (UO) and the CUTCM (listed in the MOU between UO and CUTCM), establishment of a UO-CUTCM Innovative Research Center of Traditional Medicine will be actively promoted by Associate Professor Tumilty, Professor Baxter and Dr Liu.</p>
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2019-08:

## Detection of gene-environment interactions contributing to the risk of gout in large European and Chinese sample sets

<b>Supervisor</b>	Prof Tony Merriman
<b>Department</b>	Biochemistry
<b>School / Centre</b>	Biomedical Sciences
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<b>Project outline</b>	<p>The project focuses on the genetic and environmental causes of gout, a metabolic-based arthritis of established importance in New Zealand and of increasing importance in China. Gout is caused by an innate immune reaction to monosodium urate crystals deposited in some people with hyperuricemia (elevated urate levels, a prerequisite for gout). The genetic and environmental casual factors of hyperuricemia is relatively well understood, however the causal factors of the progression from hyperuricemia to gout are poorly understood. This project would study these risk factors using large genome-wide genotyped data sets of people of European and Chinese ancestry, and whole genome and targeted resequence sample sets. The student would be involved in fine mapping of gout loci using bioinformatic approaches, and in evaluating gene-environment interactions at certain loci. The student would study the genetics of severity of gout (flare frequency and presence of tophus). One particular genetic epidemiological technique used will be variance analysis. Of particular interest will be non-dietary environment factors, for example car exhaust particulates.</p> <p>Professor Merriman collaborates with Professors Changgui Li (Qingdao University) and Yongyong Shi (Jiao Tong University, Shanghai) in researching the genetic and environmental casual risk factors of gout. We are combining large Chinese and European data sets consisting of tens of thousands of gout cases and controls.</p>
<b>References</b>	<p>Dalbeth N, Merriman TR, Stamp LK. Gout. <i>Lancet</i> 2016;388:2039-52.</p> <p>Major TJ, Dalbeth N, Stahl EA, Merriman TR (2018) An update on the genetics of hyperuricaemia and gout. <i>Nature Reviews Rheumatology</i> May 8. doi: 10.1038/s41584-018-0004-x.</p>
<b>NCD CRCC priority area</b>	Cardiovascular disease, diabetes and obesity (gout is a risk factor for these diseases), gene-environment interactions and big data.

<p><b>Supervisor's current research links with China</b></p>	<p>In April of last year Prof Merriman hosted four East Asian gout genetic epidemiology researchers in Dunedin in order to scope the establishment of an Asia-Pacific Gout Consortium (APGC), with genetics as the flagship project. This meeting went very well with the inaugural APGC meeting occurring in Harbin August 2017, which I attended and played a leading role. The next meeting of the APGC is in November 2018 in Qingdao alongside the Orient Gout Forum.</p> <p>Amongst the hosted researchers were Profs Yongyong Shi and Changgui Li from the Chinese Universities of Shanghai Jiao Tong and Qingdao, respectively. Prof Shi is a genetic epidemiologist who collaborates closely with clinical expert Prof Li on the genetic basis of gout in the Chinese population. Since the Dunedin meeting in April we have collaborated, independently of the focus being developed within-the APGC, culminating in a successful application by Prof Shi and myself to the Shanghai Science and Technology Commission for 500K RMD over three years, announced earlier this month. We have also applied to the Health Research Council of NZ – China Non-Communicable Diseases partnership fund.</p>
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2019-09:

## A blessing or a curse - What is the role of open source diabetes technology in childhood type 1 diabetes?

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<b>Project outline</b>	<p>Type 1 diabetes mellitus (T1DM) is one of the most common chronic diseases of childhood and comes with considerable day to day disease/treatment burden. While intensive insulin therapy has been shown to reduce the risk of long term complications, this comes at a price, with a 3-fold increase in severe hypoglycaemia. This can in the worst-case scenario result in seizures, coma and even death. It is therefore no surprise that hypoglycaemia is the most feared complication of diabetes for both parents and affected children alike.</p> <p>Newer (and expensive) diabetes technology for both insulin delivery and/ or glucose monitoring has been shown to not only improve glycaemic control but to also reduce hypoglycaemia. Unfortunately, the benefits of technology have not always translated well into the paediatric/adolescent age group, in part due to the burden of use. The cost of these systems to the individual or health system is also not insignificant ranging from \$2500 - \$20000 NZD.</p> <p>Finding ways to provide greater, cheaper and possibly faster access to burden reducing technology is vital if the majority of the population are to ever hope to access the benefits. Further reinforcing this, our research group has recently shown that those who are more socioeconomically deprived, and non-European are less likely to access diabetes technology.</p> <p>In response to these issues, newer devices and technology are now available open source/independent of traditional technology companies. These offer great promise, are much cheaper than traditional options, and are already being used by a minority. The danger is that there is little research to support their use or their safety.</p> <p>This PhD will be based around a randomized controlled trial of a new "open source"/independent diabetes technology. Our unit are skilled in trials and diabetes research and this would build and complement existing technology studies and collaborations underway. This is a vital and rapidly expanding area of diabetes practice, potentially of great benefit to patients in both NZ and China. The student would also gain very important skills for further academic</p>

	and clinical practice in the diabetes field. This research could also nicely lead to additional collaborative studies between China and New Zealand.
<b>NCD CRCC priority area</b>	Diabetes and Obesity
<b>Supervisor's current research links with China</b>	We have one existing collaboration with China, with Professor Junfen (Jenny) Fu. We have one study in place – based on work we have done in NZ on diabetes technology. Prof. Fu is recruiting students for this at present. We are keen to continue and expand on this collaboration relating to Type 1 diabetes using this PhD opportunity. This project would also be collaborative within NZ with existing collaborators in all major Cities on NZ.

2019-10:

## Epigenetic profiling to understand and predict response of lung cancer patients to immunotherapy treatment

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Supervisor's research page	<a href="https://www.otago.ac.nz/chatterjee-lab/index.html">https://www.otago.ac.nz/chatterjee-lab/index.html</a>
Project outline	<p><b>Background:</b> Recent immunotherapy treatments improve the survival of non-small cell lung cancer patients. Although effective for some patients, other patients are refractory to this treatment, and most patients eventually become resistant to immunotherapy drugs. Despite recent intensive research, it is not possible to predict which patients will respond to treatment, and who will be refractory to treatment. A detailed understanding of the epigenomic and transcriptomic features of non-small cell lung cancer will help to identify the factors responsible for treatment resistance and to facilitate the development of new biomarkers to predict treatment response. This project aligns with our recently funded Health Research Council-funded project, and will involve deep analysis of epigenetic profiles (DNA methylation), gene expression profiling and investigations of immune cell composition of lung cancer cell lines. If time permits the project will also include analysis of tumour tissues collected from patients who were treated with immunotherapy.</p> <p><b>Technique to be used:</b> Whole Genome and Reduced Representation Bisulfite sequencing to analyse genome-wide methylation patterns, targeted methylation analysis, RNA-Sequencing, functional analysis of candidate genes, bioinformatics to explore in-house and publicly available data in large-scale, analysis of survival and clinical data and possibly CRISPR editing</p>
References	<p>1) M.A. Silva , K.A. Ryall, C. Wilm, J. Caldara, H.J. Grote, J.C. Patterson-Kane. PD-L1 immunostaining scoring for non-small cell lung cancer based on immunosurveillance parameters. (2018). PLoS ONE 13(6): e0196464.</p> <p>2) Chatterjee A., Rodger E.J., Ahn A., Stockwell P.A., Parry M., Motwani J., Gallagher S.J., Shklovskaya E., Tiffen J., Eccles M.R.* , Hersey P.* (joint senior author). (2018). Marked global DNA hypomethylation is associated with constitutive PD-L1 expression in melanoma. iScience 4:312-25.</p>
NCD CRCC priority area	Cancer

**2019-11:**

## **Circulating tumour DNA in paediatric and other cancers**

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<b>Project outline</b>	<p>Circulating tumour DNA (ctDNA) is tumour-derived DNA that can be found in the plasma and is recognized by the presence of specific mutations in cancer genes. It has the potential to be used to measure a patient's disease burden and therefore could be used as a marker of treatment response, relapse and tumour evolution. Because it only requires the patient to provide a standard blood sample, ctDNA can also help move aspects of patient surveillance away from large hospitals to the community primary care level.</p> <p>We are building a new research collaboration with The First Bethune Hospital of Jilin University to explore the application of ctDNA to paediatric and other cancers. We propose a PhD project that tests whether ctDNA can be successfully used in diverse paediatric cancers to rapidly determine treatment response, residual disease or relapse. The study may extend to an examination of the molecular changes that are associated with relapse in different forms of paediatric cancer.</p>
<b>NCD CRCC priority area</b>	Cancer
<b>Supervisor's current research links with China</b>	<p>Prof Guilford has a current research collaboration on gastric cancer with Prof Huchen Zhou at the University of Jiao Tong Shanghai. This application demonstrates a desire to also collaborate with researchers at Jilin University, Changchun, in a different research area (ctDNA). Proposed collaborators at Jilin University include A/Prof Jian Chang (paediatric oncology), Prof. Jiuwei Cui (oncology), Prof. Pengfei Ge (neurosurgery) and A/Prof. Jinhai Yu (digestive surgery).</p> <p>Our laboratory has extensive experience with ctDNA, including recent clinical studies on colorectal cancer and breast cancer.</p>

2019-12:

## Chemical tools to study cannabinoid type 1 receptor

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<b>Project outline</b>	<p>The cannabinoid type 1 receptor (CB1R) is a Class A GPCR that plays an important role in many human pathophysiological conditions such as cancer, neurological and metabolic disorders. As such, there is a requirement to develop tools to better understand the role of CB1R in these disease pathologies. Globally, CB1R is very topical because of the increasing number of countries legalising cannabis that contains, among other chemical constituents, CB1R agonists. There are a variety of existing tools available for studying CB1R such as fluorescent antibodies, radioligands, covalent ligands and selective small molecule ligands, however each of these have limitations. This aim of this PhD project is to design and synthesise new chemical tools for CB1R that will allow exquisite study of CB1R in live cells and tissue <i>ex vivo</i> and <i>in vivo</i>, leading to improved and more efficacious drug intervention targeting CB1R.</p>
<b>NCD CRCC priority area</b>	Cancer, diabetes and obesity, neuropsychiatric disorders and age-related diseases.
<b>Supervisor's current research links with China</b>	Dr Vernall is very interested in developing link(s) and an enduring relationship with Chinese scientists.

## 2019-13:

### Effect of Carbohydrate Restriction Weight Gain, Glycaemia and Pregnancy Outcomes in Chinese women with Gestational Diabetes

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<b>Project outline</b>	<p>Diabetes in pregnancy affects both women and their offspring. There are more complications during pregnancy and metabolic disease later in life, especially in those who are overweight and gain excess weight during pregnancy. In New Zealand more Māori and Pacific women have diabetes during pregnancy than European women. Chinese women also have an increasing rate of diabetes in pregnancy despite less obesity than Maori and Pacific women and often require insulin therapy to manage post-prandial glucose levels. Many women attempt to reduce carbohydrate intake during pregnancy to avoid the need for this insulin treatment yet there is little evidence about the influence of lower CHO diets on maternal and foetal outcomes. Few pregnant women gain weight according to international guidelines, and strategies to optimise weight gain are required. This project will investigate whether reducing carbohydrate, while preventing ketosis, will optimise weight gain during pregnancy including any effects on glucose control, insulin use and pregnancy and neonatal outcomes in Chinese women with diabetes in pregnancy. This PhD will include a randomised controlled intervention performed within a clinical setting and therefore will directly inform ethnic appropriate dietary interventions for women with diabetes in pregnancy.</p>
<b>References</b>	<ol style="list-style-type: none"><li>1. Carroll RC, Stubbs RS, Krebs JD. Bariatric surgery is the most effective treatment for type 2 diabetes currently available but standardised definitions are important. <i>N Engl J Med</i> 2018; 378:93-96. <u>January 4, 2018</u> DOI: 10.1056/NEJMc1714001</li><li>2. Gaffney K, Lucero A, Stoner L, Faulkner J, Whitfield P, Krebs JD, Rowlands D. No Benefit of Whey Protein to Glycaemic Control After 10 Weeks HIT in Type-2 Diabetes. <i>Medicine and Science in Sports and Exercise. Med Sci Sports Exerc.</i> 2018, 50(1):11-17]. doi: 10.1249/MSS.0000000000001404.</li><li>3. Othman N.A., Docherty P.D, Krebs JD, Bell D.A, Chase J.G. The necessity of identifying the basal glucose set-point in the IVGTT for patients with Type 2 Diabetes. <i>Bio Medical Engineering OnLine.</i> 2015 DOI: 10.1186/s12938-015-0015-7</li></ol>

	<ol style="list-style-type: none"> <li>4. Wilson J, Doherty P.D, Stubbs R. S, Chase J.G, Krebs J.D. Assessment of the Dynamic Insulin Sensitivity and Secretion Test (DISST) pre and post gastric bypass surgery. Experimental and Clinical Endocrinology and Diabetes 2018. DOI: 10.1055/a-0603-3539 (accepted for publication 9.4.18)</li> <li>5. Krebs JD, Bell D, Hall R, Parry-Strong A, Docherty P, Clarke K, Chase JG. Improvements in Glucose Metabolism and Insulin Sensitivity with a Low-Carbohydrate Diet in Obese Patients with Type 2 Diabetes. Journal of the American College of Nutrition 2013, 32:1, 11-17 <a href="http://dx.doi.org/10.1080/07315724.2013.767630">http://dx.doi.org/10.1080/07315724.2013.767630</a></li> <li>6. Krebs JD, Elley CR, Parry-Strong A, Lunt H, P Drury, Bell DA, Robinson ES. Moyes S, Mann JI. The Diabetes Excess Weight Loss (DEWL) Trial: a randomised controlled trial of high-protein versus high-carbohydrate diets over 2 years in type 2 diabetes. Diabetologia 2012 Apr;55(4):905-14. DOI 10.1007/s00125-012-2461-0.</li> <li>7. Krebs JD. Browning LM. McLean NK. Rothwell JL. Mishra GD. Moore CS. Jebb SA. Additive benefits of long-chain n-3 polyunsaturated fatty acids and weight-loss in the management of cardiovascular disease risk in overweight hyperinsulinaemic women. [Journal Article. Randomized Controlled Trial. Research Support, Non-U.S. Gov't] International Journal of Obesity. 30(10):1535-44, 2006 Oct.</li> </ol>
<b>NCD CRCC priority area</b>	Diabetes and Obesity
<b>Supervisor's current research links with China</b>	<p>Assoc Prof Krebs also took part in a NCD CRCC scientific delegation to Shanghai and Beijing in 2017 and hosted a return visit of senior Chinese researchers to Wellington.</p> <p>AP Krebs was invited to attend the inaugural NSFC/HRC workshop held in Beijing in May 2017 and the return workshop in Dec 2017 in Wellington, New Zealand, highlighting his interest in establishing new collaborations with China. It was at that workshop that AP Krebs met Prof Yang and established the shared interest in this collaboration.</p>

**2019-14:**

## **Influence of Body Composition on Effect of Very Low Calorie Diet or Exercise in people with Pre-Diabetes**

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<b>Project outline</b>	<p>Type 2 diabetes (T2DM) is a major health problem in both New Zealand and China. Rates of T2DM have dramatically increased in China, with less associated obesity than seen in New Zealand. Both diet and exercise can induce weight loss and improve insulin sensitivity in those with, or at high risk for T2DM. However, the mechanisms leading to improved insulin sensitivity, and extent of improvement with these two interventions is different, likely dependent on an individual's baseline body composition, the proportion of lean to fat (L:F) mass, and ratio of L:F mass lost. This is important to NZ and China because Pacific, Māori and Asian NZers have similarly high rates of T2DM, higher than NZ Europeans, yet very different L:F mass. Differences in body composition in Chinese might explain the high rates of T2DM and inform appropriate interventions. This research explores if, in those with pre diabetes or early T2DM, diet or exercise induced weight loss results in different effects on glucose metabolism. We hypothesise that improved glucose metabolism will be determined by baseline L:F mass ratios, and proportion of L:F mass lost during each intervention. Lifestyle advice could therefore be individualised to baseline L:F mass which might also be predicted by ethnicity. This research builds on an HRC feasibility study (HRC 17/542), which confirmed achievability and acceptability of the interventions and protocol. The PhD will explore the effects of a Very Low Calorie Diet or a combined resistance training (RT) and high intensity interval training (HIIT) protocol in Chinese with Pre-Diabetes. Outcomes will be measures of glucose metabolism including insulin sensitivity by euglycaemic clamp, body composition by DXA and energy expenditure by indirect hood calorimetry. This will be parallel and complementary to similar work conducted by another PhD student in Pacific, Maori, European and South Asian NZers, and will enable comparisons.</p>
<b>References</b>	<ol style="list-style-type: none"><li>1. Carroll RC, Stubbs RS, Krebs JD. Bariatric surgery is the most effective treatment for type 2 diabetes currently available but standardised definitions are important. N Engl J Med 2018; 378:93-96. <u>January 4, 2018</u> DOI: 10.1056/NEJMc1714001</li><li>2. Gaffney K, Lucero A, Stoner L, Faulkner J, Whitfield P, Krebs JD, Rowlands D. No Benefit of Whey Protein to Glycaemic Control After 10 Weeks HIT in</li></ol>



	<p>Type-2 Diabetes. <i>Medicine and Science in Sports and Exercise</i>. <u>Med Sci Sports Exerc</u>. 2018, 50(1):11-17]. doi: 10.1249/MSS.0000000000001404.</p> <p>3. Othman N.A., Docherty P.D, Krebs JD, Bell D.A, Chase J.G. The necessity of identifying the basal glucose set-point in the IVGTT for patients with Type 2 Diabetes. <i>Bio Medical Engineering OnLine</i>. 2015 DOI: 10.1186/s12938-015-0015-7</p> <p>4. Wilson J, Doherty P.D, Stubbs R. S, Chase J.G, Krebs J.D. Assessment of the Dynamic Insulin Sensitivity and Secretion Test (DISST) pre and post gastric bypass surgery. <i>Experimental and Clinical Endocrinology and Diabetes</i> 2018. DOI: 10.1055/a-0603-3539 (accepted for publication 9.4.18)</p> <p>5. Krebs JD, Bell D, Hall R, Parry-Strong A, Docherty P, Clarke K, Chase JG. Improvements in Glucose Metabolism and Insulin Sensitivity with a Low-Carbohydrate Diet in Obese Patients with Type 2 Diabetes. <i>Journal of the American College of Nutrition</i> 2013, 32:1, 11-17  <a href="http://dx.doi.org/10.1080/07315724.2013.767630">http://dx.doi.org/10.1080/07315724.2013.767630</a></p> <p>6. Krebs JD, Elley CR, Parry-Strong A, Lunt H, P Drury, Bell DA, Robinson ES. Moyes S, Mann JI. The Diabetes Excess Weight Loss (DEWL) Trial: a randomised controlled trial of high-protein versus high-carbohydrate diets over 2 years in type 2 diabetes. <i>Diabetologia</i> 2012 Apr;55(4):905-14. DOI 10.1007/s00125-012-2461-0.</p> <p>7. Krebs JD. Browning LM. McLean NK. Rothwell JL. Mishra GD. Moore CS. Jebb SA. Additive benefits of long-chain n-3 polyunsaturated fatty acids and weight-loss in the management of cardiovascular disease risk in overweight hyperinsulinaemic women. [Journal Article. Randomized Controlled Trial. Research Support, Non-U.S. Gov't] <i>International Journal of Obesity</i>. 30(10):1535-44, 2006 Oct.</p>
<b>NCD CRCC priority area</b>	Diabetes and Obesity, Cardiovascular complications, and gene environment interactions
<b>Supervisor's current research links with China</b>	<p>Assoc Prof Krebs also took part in a NCD CRCC scientific delegation to Shanghai and Beijing in 2017 and hosted a return visit of senior Chinese researchers to Wellington.</p> <p>AP Krebs was invited to attend the inaugural NSFC/HRC workshop held in Beijing in May 2017 and the return workshop in Dec 2017 in Wellington, New Zealand, highlighting his interest in establishing new collaborations with China. It was at that workshop that AP Krebs met Prof Yang and established the shared interest in this collaboration.</p>

2019-15:

## Pathological behaviour in sensory processing in children at-risk for developmental dyslexia

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<b>Project outline</b>	<p>For neuropsychiatric disorders such as learning disabilities, the earlier the diagnosis and intervention, the better the outcome. Developmental dyslexia affects between 3% and 10% across human populations, depending on the writing and sound structures of the language. Dyslexia is currently diagnosed in the early school years after the child shows difficulties in reading; however, the underlying sensory differences are likely already established, limiting the effectiveness of clinical intervention.</p> <p>A primary difficulty in early diagnosis of dyslexia is distinguishing pathological behaviour from the normal variation in a population. Dyslexia correlates with a number of genetic, neurological, and behavioural symptoms in population samples; however, overlap between the pathological and healthy samples of these symptoms make using any single measure challenging. What is not known in current research is whether this overlap is real or a result of the small sample sizes in most studies.</p> <p>In the current project, we will take measurements of neuro-sensory behaviours from hundreds of children that are either normal or with dyslexia using audio-visual games on smart phones. Such broad samples in both NZ and China with a full coverage of ethnicities/languages and critical time points will allow a better determination of proper diagnosis protocols for children before they encounter difficulties. This can lead to a filtering process for genetic testing of biomarkers for diagnosis.</p> <p>The individual joining this project will work with a diverse multi-disciplinary team from psychological, genetic, education, and computer sciences.</p>
<b>References</b>	<p>De Vos, A., Vanvooren, S., Vanderauwea, J., Ghesquiere, P., &amp; Wouters, J. (2017). A longitudinal study investigating neural processing of speech envelope modulation rates in children with (a family risk for) dyslexia. <i>Cortex</i>, 93, 206-219.</p> <p>Hatfield, H. (2016). Self-guided reading: Touch-based measures of syntactic processing. <i>Journal of Psycholinguistic Research</i>, 45(1), 121-141.</p>

	<p>Holden, J.G., Greijn, L.T., van Rooij, M.J.W., Wijnants, M.L., &amp; Bosman, A.M.T. (2014). Dyslexic and skilled reading dynamics are self-similar. <i>Annals of Dyslexia</i>, 64(3), 202-221.</p> <p>Paracchini, S., Diaz, R., Stein, J. (2016). Advances in dyslexia genetics -- New insights Into the role of brain asymmetries. <i>Advances in Genetics</i>, 96, 54-97.</p> <p>Benitez-Burraco, A. Jimenez-Bravo, M., &amp; Marrero, V. (forthcoming). Relying on brain rhythms for improving the diagnosis of dyslexia.</p> <p>1. Wijnants, M.L., Hasselman, F., Cox, R.F.A., Bosman, A.M.T., &amp; Van Orden, G. (2012). An interaction-dominant perspective on reading fluency and dyslexia. <i>Annals of Dyslexia</i>, 62(2), 100-119.</p>
<b>NCD CRCC priority area</b>	neuropsychiatric disorders, gene-environment interactions and big data
<b>Supervisor's current research links with China</b>	<p>This multidisciplinary proposal can accommodate a postdoctoral fellow or a visiting scholar/student.</p> <p>The supervision team includes Dr Wen-Hua Wei, Department of Women's and Children's Health, University of Otago. Dr Wei is a human geneticist and bioinformatician who will additionally interact in a non-supervisory capacity with researchers from psychology, education, and computer science.</p> <p>Dr Hatfield is hosting Dr Shaowei Ma from Langfang Teachers University who recently completed her PhD in education at the University of Canterbury and lead a psycholinguistics study cohort in Hebei, China. Dr Hatfield also previously supervised a PhD in Chinese language teaching in Malaysia. Before moving into linguistics, Dr Hatfield was an Asian Studies major, studying Chinese history and language, including a semester studying at Nankai University, Tianjin, China.</p> <p>Dr Wei has developed research links with key players in China, including Professor Ranran Song who leads a large dyslexia cohort in Hubei (DOI: 10.1038/srep36697) and Professor Li-Hai Tan who is a national leader in neuroimaging research and leads a dyslexia cohort in Guangdong (Tan and Li 2015, <i>J. Neurolinguistics</i> 33: 1-2).</p>

2019-16:

## Arginine metabolism and neurodegenerative and psychiatric disorders

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<b>Supervisor's research page</b>	<a href="http://www.otago.ac.nz/anatomy/people/staff/profile/index.html?id=250">http://www.otago.ac.nz/anatomy/people/staff/profile/index.html?id=250</a>
<b>Project outline</b>	<p>L-arginine is a semi-essential amino acid with a number of bioactive metabolites. Nitric oxide, for example, is a gaseous signalling molecule that plays an important role in synaptic plasticity and learning and memory, and is a key factor for the stabilization and regulation of the vascular microenvironment. Polyamines are essential for cells to grow and to function in an optimal manner. Agmatine, decarboxylated arginine, regulates the production of nitric oxide and polyamines, and participates directly in learning and memory processes.</p> <p>Accumulating evidence (including our own) implicates altered arginine metabolism in the pathogenesis of neurodegenerative and psychiatric disorders. There are research projects available for PhD students and/or visiting fellows to further explore the mechanisms and biomarkers of the neurodegenerative and psychiatric disorders (such as Alzheimer's disease, Parkinson's disease, frontotemporal dementia, schizophrenia and major depression) using post-mortem human brain tissue, biofluids and various animal models.</p>
<b>References</b>	<p>Bergin DH, Jing Y, Mockett BG, Zhang H, Abraham WC, Liu P. (2018) Altered plasma arginine metabolome precedes behavioural and brain arginine metabolomic profile changes in the APPswe/PS1ΔE9 mouse model of Alzheimer's disease. <i>Translational Psychiatry</i>, 8:108.</p> <p>Liu P, Jing Y, Collie ND, Dean B, Bilkey DK, Zhang H. (2016). Altered brain arginine metabolism in schizophrenia. <i>Translational Psychiatry</i>, 6:e871.</p> <p>Liu P, Fleete MS, Jing Y, Collie ND, Curtis MA, Waldvogel HJ, Faull RLM, Abraham WC, Zhang H. (2014). Altered arginine metabolism in Alzheimer's disease brain. <i>Neurobiology of Aging</i>, 35:1992-2003.</p>
<b>NCD CRCC priority area</b>	Neuropsychiatric disorders and age-related diseases
<b>Supervisor's current research links with China</b>	<p>Very interested in developing links with Chinese researchers.</p> <p>Prof. Chunbao Li</p> <p>Prof. Jian Wang?</p>

2019-17:

## Internet of Things for Study of Child Obesity

<b>Supervisors</b>	Dr Zhiyi Huang, Associate Prof Dr Haibo Zhang and Prof Rachael Taylor
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<b>Supervisor's research page</b>	<a href="https://www.otago.ac.nz/computer-science/people/otago675894.html">https://www.otago.ac.nz/computer-science/people/otago675894.html</a> <a href="https://www.otago.ac.nz/computer-science/people/otago675737.html">https://www.otago.ac.nz/computer-science/people/otago675737.html</a> <a href="https://www.otago.ac.nz/dsm/people/expertise/profile/?id=806">https://www.otago.ac.nz/dsm/people/expertise/profile/?id=806</a>
<b>Project outline</b>	<p>Insufficient sleep, inadequate physical activity, and too much time spent sedentary are all risk factors for child obesity. At present, no single tool exists that can measure all three behaviors of interest, in a way that has little participant or researcher burden. This project aims to investigate an Internet-of-Things based solution that is accurate, reliable, and easy to use for monitoring movement behaviors across the full 24-hour day, that is, sleep, activity, and sedentary time. Specifically, we will develop: (a) smart sensor devices that are able to accurately measure sleep time, detect wakeup, recognize and measure physical activities, estimate proximity (e.g. distance between parents and children), etc. (b) reliable wireless communication protocols for both runtime configuration of monitoring tasks and the collection of measurement data. Using such wireless communication protocols, users can remotely reconfigure what data to collect as well as the setting of the parameters, and the measurements can be automatically sent back to a central machine (e.g. a desktop PC) for analysis; (c) a set of tools for processing and analyzing the collected data and automatically generating graphs, etc.</p> <p>We expect to have a full-time PhD student to work on this project, supervised by experts in both computer engineering and childhood obesity. The expected research outcomes will include publications in good-ranking international conferences/journals and a prototype for demonstration, which are likely to improve the success in applying for MBIE or other internal funding.</p>
<b>References</b>	<p>We have carried out research on motion tracking and activity recognition using motion sensors such as accelerometer, gyroscope, and magnetometer. Here are some youtube videos for the solutions we developed.</p> <p><a href="https://www.youtube.com/channel/UCBW71tcZHTyRO0dbsvJJwCA/videos?view_as=subscriber">https://www.youtube.com/channel/UCBW71tcZHTyRO0dbsvJJwCA/videos?view_as=subscriber</a></p>
<b>NCD CRCC priority area</b>	Diabetes and obesity

<b>Supervisor's current research links with China</b>	<p>Dr Zhiyi Huang has a long-term collaboration with Shanghai Jiao Tong University and Tsinghua University. He has collaboration with a Chinese company called EEGSmart on processing EEG data for sleep stage detection.</p> <p>Dr Haibo Zhang is interested in developing collaborations with the center for Intelligent wireless networking and cooperative control in Shanghai Jiaotong University. He has visited this research center in June of 2018.</p>
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