RESEARCH LAY REPORTS - MARCH 2016

For research undertaken in 2015

Grant No. 1465
Research Fellowship
Dr Nikki Moreland

Acute Reumatic Fever (ARF) is an autoimmune disease that follows an untreated group A streptococcus (GAS) infection. Disease pathways are poorly understood and many questions remain around how ARF develops. The T antigen is a type specific marker expressed by GAS. By studying T antigen specific antibodies in the sera of patients with ARF this fellowship has investigated the history of GAS infections in these patients. It has shown that ARF is associated with multiple previous exposures to GAS, and suggests that bacterial infections prime the immune system to turn on itself. *Grant closed.*

Grant No. 1467
Research Fellowship
Dr Anne von Zychlinski-Kleffmann

Lipoprotein(a) [Lp(a)] is a major risk factor for developing heart disease affecting one in five people. My research identified Histidine-rich-glycoprotein as a potential biomarker to differentiate between good and bad Lp(a). This protein can act as an adaptor to trap Lp(a) to sites of vascular injuries and interfere with the coagulation cascade, which makes this protein a good candidate for a new therapeutic target. Furthermore I reported the protein make-up of the major lipoprotein classes in a comparative study. Within only three years my project is moving from a discovery phase into the translational phase. *Grant closed.*

Grant No. 1509
Project Grant
Associate Professor Sally McCormick

Heart disease is a major cause of death. High levels of Lp(a), a form of “bad cholesterol is an important lipid risk factor for developing heart disease as is low levels of HDL or “good cholesterol”. We previously observed that Lp(a) increases HDL levels in mice and our project aims to establish the underlying mechanism for this. Understanding the interaction between Lp(a) and HDL is important so patients can receive appropriate lipid management to reduce their risk of heart disease i.e. drugs that lower “bad cholesterol” might not be ideal if they also lower “good cholesterol”

Grant No. 1515
Douglas Senior Fellowship
Dr Natalie Walker

During this three year fellowship I have focussed on encouraging people to take action to prevent heart disease. In particular I have 1) encouraged people to stop smoking (given smoking is the leading risk factor for heart disease) using new and innovative treatments (for example e-cigarettes and cytisine); 2) identified better effective methods of identifying people in the community at risk of heart disease and provide effective CVD management, and 3) gained a better understanding of why some people (particularly women) at high risk of heart disease choose not to take action to improve their health, while others do.

Grant No. 1516
Dr Kathryn Waddell-Smith
Clinical Cardiology Fellowship in Inherited Heart Disease
Kathryn has undertaken research in familial long QT syndrome, a genetic heart condition which predisposes people (especially the young) to sudden and unexpected death. She has concentrated on identifying those people who may be at risk through the simple act of performing a family history while patients are admitted on the cardiology ward. Kathryn has also investigated how often people take their medication for long QT syndrome (mostly not very often!), and what the side effects and levels of satisfaction are after surgical treatment for long QT syndrome (both are very high). *Grant closed.*

Grant No.1518
Research Fellowship
Dr Meredith Peddie
An expanding body of evidence indicates that sedentary behaviour is a risk factor for cardio-metabolic disease. The results of two recent intervention trials provided strong experimental evidence that breaking prolonged sitting with regular short bouts of physical activity improved postprandial glucose and insulin concentrations. However, the effect on postprandial lipid concentrations is still not fully understood. To address this we will conduct a randomised crossover experimental trial to examine the potential cardio-metabolic benefits of regularly breaking prolonged sitting with short bouts of physical activity. *Grant closed.*

Grant No 1519:
Dr Brie Sorrenson
Research Fellowship
The focus of this research was to determine whether glucose regulation of the Wnt signaling pathway is a way cells respond to high glucose levels to explain the link between type-2 diabetes and atherosclerosis. Results show that glucose regulates the Wnt signaling factors β-catenin and LRP6 in macrophage and pancreatic β-cell lines and this regulation is required for a) glucose-induced cell migration and adhesion, which are processes involved in atherosclerosis, and b) insulin secretion from pancreatic β-cells, which is important for maintaining appropriate blood glucose levels. The data support that β-catenin may be involved in insulin secretion through a novel mechanism regulating the movement of insulin granules to be released from the cell.

Grant No. 1520
Research Fellowship
Dr Ruth Teh
The Heart Foundation has funded this fellowship to examine heart health and its' management in 85+, the fastest growing population segment in New Zealand. The study found that those aged 85+ have an average of 5 different conditions and heart disease coexisting with conditions of different organ systems impact health outcomes differently. We also found in every 100 people aged 85+, 20 to 35 of them had atrial fibrillation (irregular heart beat) and stroke is a major complication. We are examining the management of AF, high blood pressure, and diet quality on new and subsequent heart disease and stroke to inform existing clinical guidelines which are based on single disease on younger populations.

Grant No. 1521
Project Grant
Mrs Julie Bhosale
Childhood is a very important developmental time; physical activity habits that are established during this time are likely to last into adulthood. Unfortunately a significant number of children do not do enough physical activity on a daily basis and we are seeing negative short and long term health consequences related to this. In particular it is widely believed that children's freedom to play and roam without an adult present has declined from earlier generations, however prior to this thesis there has been little scientific research to support this. This thesis was the first study to directly assess the change in children's ability to play and roam unsupervised (independent mobility) between grandparents, parents and children. New innovative measurement tools were developed especially for this research, including a special online mapping programme. It was found that for certain activities, including crossing main roads, cycling, going to and from school this had decreased by 50%, especially from parents to children today. On the other hand many children are now enrolled in numerous structured organised activities, compared to their parents. Findings from this work showed that children who did have more freedom to play unsupervised did more physical activity on a daily basis than those who were not allowed. This thesis provides an important and timely contribution to the field of children's health and it is recommended that new strategies and polices are developed to help support communities and families allow children's more freedom to play in the neighbourhood as previous generations have done.

Grant No. 1522
Postgraduate Scholarship
Mrs Catherine Crofts
Excessive serum insulin, (hyperinsulinaemia) is implicated with the development of many metabolic diseases including diabetes, heart disease, dementia and some cancers. Hyperinsulinaemia is a "silent disease" and affects most people with "pre-diabetes" or type 2 diabetes. Hyperinsulinaemia can be diagnosed by measuring plasma insulin levels 2 hours after a 100g oral glucose tolerance test. It is best managed using a combination of diet and physical activity. The best dietary strategies are Mediterranean or carbohydrate-restricted diets, and activity should include a combination of resistance, or weight, training and high intensity interval training. *Grant Closed.*

Grant No. 1527
Small Project Grant
Dr Tracy Perry
An expanding body of evidence indicates that sedentary behaviour is a risk factor for cardio-metabolic disease. The results of two recent intervention trials provided strong experimental evidence that breaking prolonged sitting with regular short bouts of physical activity improved postprandial glucose and insulin concentrations. However, the effect on postprandial lipid concentrations is still not fully understood. To address this we will conduct a randomised crossover experimental trial to examine the potential cardio-metabolic benefits of regularly breaking prolonged sitting with short bouts of physical activity.

Grant No 1558:
Professor Chris Charles
Project Grant
Cardiovascular disease is the leading cause of death in New Zealand. We have recently discovered novel circulating fragments of heart hormones (ANPsp/BNPsp) measured in blood from patients suffering heart attack. BNPsp has been shown to protect the heart when administered early in experimental models of heart attack. Current aims are to determine if BNPsp can also protect the heart when administered at the more clinically relevant time of opening the occluded artery. We will also determine if ANPsp has similar cardioprotective actions. This knowledge has the potential to improve survival and may lead to novel therapeutic agents.

Grant No. 1559
Project Grant
Dr Leigh Ellmers
Cardiovascular disease is the leading cause of death in New Zealanders. Understanding the way this disease progresses and exploration of potential new treatments is therefore crucial. Hydrogen sulphide is being recognised as an important molecule in the cardiovascular system. In this study we the will investigate both the role internally produced hydrogen sulphide plays in cardiac damage after a heart attack, as well as assessing its therapeutic potential by treating mice with a novel hydrogen sulphide donor compound after heart attack. These studies will elucidate the role of hydrogen sulphide in cardiac injury at both the physiological and molecular level, and assess the potential of this molecule in protecting the heart after a heart attack.

Grant No 1560:
Project Grant
Dr Helen Eyles
One in five New Zealanders 35-years+ already has cardiovascular disease (CVD). Following a diet low in salt is especially important for these people because it can reduce blood pressure and chance of another heart event. However, making heart healthy food choices can be confusing and difficult. A simple, free smartphone application (app) called SaltSwitch could provide a novel solution. SaltSwitch provides shoppers with traffic-light nutrition labels and low salt food options. Our aim was to determine the effect of SaltSwitch on the salt content of food purchases made by households with at least one member with diagnosed CVD. Pilot study findings are due mid-2016. *Grant Closed.*

Grant No. 1561
Project Grant
Dr Kimberley Mellor
Heart failure is the leading cause of death in diabetic patients. Despite over a decade of investigation, the ultimate cause of heart failure is unknown. Until now, a detailed understanding of how increased heart size affects heart pump efficiency in diabetes has been limited by the tools available. Our studies investigate the molecular and mechano-energetic properties of heart pathology, contributing to a new understanding of the mechanisms of heart failure, particularly in diabetes and cardiac hypertrophy. The findings from these studies will provide substantial progress in the development of new targeted therapies for diabetic cardiopathology.

Grant No 1562:
Associate Professor Miriam Rademaker
Project Grant
Despite kidney failure being a frequent complication of heart failure (HF), as well as an important risk factor for doing poorly, the underlying causes remain poorly understood, and treatments that protect kidney function in HF are lacking. The findings from our project to date suggest that an episode of HF decompensation leads to kidney injury and then repair by scarring, which results in a permanent decline in kidney function. In addition, we found administration of urocortin2 in HF has favourable effects on body pressures, hormones and kidney tissue mediators of injury and scarring which support its potential as a reno-protective treatment in HF. *Grant Closed.*

Grant No. 1564
Project Grant
Dr Jinny Willis
HDL is often referred to as 'good' cholesterol because, in general, high levels of HDL are associated with lower rates of heart disease. However, our previous research confirmed anecdotal reports that not everyone with high HDL remains free of heart disease. The composition of HDL particles and the extent to which the particles perform biochemical functions, is likely more important than simply the amount of HDL. This ongoing research aims to characterise the components that make up HDL particles, as well as how effectively the particles work, using HDL isolated from individuals with high HDL levels, who either have heart disease, or who have no evidence of heart disease.

Grant No. 1568
Maori CV Research Fellowship
Dr Geoff Kira
Cardiac rehabilitation is a programme of recovery after a heart event. The attendance of CR programmes is low (30-50%). Since Māori have high rates of heart disease, we undertook to develop a programme that aimed for the highest levels of participation. With the assistance of a fellowship from the Heart Foundation of New Zealand and Massey University we have conducted interviews of Māori patients that attended, and did not attend, CR. Results from this study identified potential ways to improve uptake using Māori knowledge. Currently the ethics approval of second phase is underway (Funded by Palmerston North Medical Research Foundation).

Grant No. 1570
Research Fellowship
Dr Wilma Waterlander
This research aims to take a food systems approach (all processes involved in feeding a population) to develop sustainable public health nutrition interventions. The first study revealed that ultra-processed foods are both the largest and the unhealthiest packaged food category in NZ supermarkets. Next, I developed new research methods that will follow food products along the chain (from farm to supermarket) to identify what happens to the nutritional and monetary value. I use the NZ potato industry as a case study and aim to discover who the main players are and what role they play. Ultimately, I aim to find levers for change to develop a healthier food future for NZ.

Grant No. 1571
Postgraduate Scholarship
Ms Renee Miller
Unlike systolic heart failure (HF), which is marked by decrease in pumping efficacy, diastolic HF is difficult to diagnose due to normal systolic function, left ventricular (LV) dimensions and LV volumes. Mechanical characterisation of diseased tissue, however, can lead to accurate diagnosis of diastolic HF. Magnetic resonance elastography (MRE) is a non-invasive way of using MRI and sound waves to measure the tissue stiffness. Through this research, a method is being developed which combines a computational model of the heart with MRE data to measure directional stiffness in cardiac tissue, providing insight into structural changes resulting from diastolic HF.

Grant No. 1572
Postgraduate Scholarship
Mr Toan Pham
Right ventricular failure (RVF) is the leading cause of death in pulmonary hypertension. The common cause of RV failure is an increase of pulmonary resistance that leads to progressive RV hypertrophy (enlargement) in order to produce the demand of higher pressure; however, the underlying mechanism of the failure remains unknown. With unique measurement techniques employed to study trabeculae (microcalorimetry) and mitochondria (substrate-inhibitor titrations followed fluorometrically in real-time), our group aims to be the first to study the mechanoenergetics of isolated tissues laboratory rats experiencing Right Heart Failure.

Grant No 1575:
Small Project
Dr Darren Hooks
Certain types of cardiac arrhythmia remain difficult to diagnose and treat. This project aims to develop a new tool able to reconstruct the origin and mechanism of arrhythmia based on projection of high-density electrical recordings made over the torso surface back to the level of the heart. Specially designed x-ray lucent electrodes built into strips to allow coverage of the torso with 128 electrodes have been tested in three patients undergoing an ablation procedure for arrhythmia. Work to reconstruct electrical activation sequence over the heart from these detailed recordings is ongoing. *Grant Closed.*

Grant No. 1576
Small Project
Dr Nikki Moreland
Acute Rheumatic fever (ARF) is an autoimmune disease but the triggers for autoimmunity remain largely unknown. This study used small protein chips that encode over 9000 human proteins to identify new human proteins that maybe involved in the development of ARF. Our work has identified 6 human antigens as possible new targets for antibodies in ARF patients.

Grant No 1579:
Small Project
Dr Anna Rolleston
Māori have poor health outcomes compared to non-Māori. There is a need to be strategic and innovative in the management of Māori health. From a Māori worldview, a holistic approach to health is innate and it is difficult to separate interconnected elements which incorporates the physical, mental, spiritual and family characteristics of the Māori world. The overarching aim of this research project was to determine the effect of an 8-month kaupapa Māori cardiovascular risk management plan on clinical outcomes, cardiovascular risk and quality of life. The study endeavoured to manage cardiovascular health within a 'space' that utilised both Māori knowledge and Western science.

Grant No. 1581
Project Grant
Dr Stefanie Vandevijvere
As part of pilot testing a method to monitor (un)healthy food availability, the density of (un)healthy food outlets around homes and schools will be measured, as well as presence of (un)healthy food outlets within predefined distances to homes and schools in Auckland. In a random sample of supermarkets, the shelf space devoted to healthy and unhealthy foods, the types of foods located end of aisle and the proportion of confectionary-free checkouts will be evaluated. Systematic monitoring of (un)healthy food availability and its impacts on health is essential for informing effective policy responses aimed at reducing obesity and chronic diseases.

Grant No. 1598
Project Grant
Associate Professor Steven Gieseg
Using plaque tissue taken from patients' carotid artery we have been able to grow and test the real cellular tissue involved in vascular disease within the laboratory. This plaque tissue is very active and generates large amounts of free radicals when their inflammatory systems are switched on. Cell culture work has shown that this comes from a free radical generating enzyme and using inhibitors we have shown that this same system appears to be at work in the active plaque that was removed by the surgeon. Measuring the products of the radicals should provide better diagnostic tests in the future.

Grant No. 1599
Project Grant
Dr Peter Jones
RyR2 is a protein that helps control the strength of each heartbeat. Stress can increase the activity of RyR2 to allow the heart to beat more forcefully. However, during heart failure or diabetes the activity of RyR2 can become uncontrolled and can lead to a weakened contraction or arrhythmias. This Heart Foundation and Grace Cranston Charitable Trust funded project has identified two novel 'stress' pathways by which RyR2 activity can be increased. It has also identified how these pathways interact with high glucose; this helps us to understand why diabetes and chronic stress lead to cardiac disease.

Grant No. 1600
Project Grant
Dr Rajesh Katare
Stem cell therapy is not effective in patients with diabetes due to the reduction in the available pool and functional deficit of the diabetic stem cells, suggesting the need for novel therapeutic modalities. We have newly identified the dysregulation of key micromolecules in the diabetic stem cells which are necessary for growth and survival of these cells. Importantly, genetically engineering the diabetic stem cells to restore the micromolecules significantly improved their functional efficacy. Currently, we are performing a proof-of-concept animal studies to determine if the genetically engineered diabetic stem cells can improve the function of an ischaemic heart.

Grant No. 1601
Project Grant
Associate Professor Denis Loiselle
The aim of our research is to reveal the structure, mechanics and energetics of the failing right heart. Little is currently known about right heart failure beyond the fact that there is no known cure and that death commonly occurs rapidly after diagnosis. We plan to undertake a comprehensive investigation of the changes to microstructure (particularly of the t-tubular network that conducts electrical excitation), mechanics (pressure development and work performance), energetics (heat production and contractile efficiency) and mitochondrial ATP production. Right-heart failure will be induced in rats by a single injection of monocrotaline, a drug that impairs the pulmonary circulation.

Grant No. 1602
Project Grant
Dr Sandra Mandic
This study examines parental motivations and barriers for active transport to school, perceptions of the built environment and safety of the route to school, parental physical activity habits and weight status and their relationship to active transport to school habits in adolescents. This project started in July 2014. We finalized study questionnaire and initiated data collection in late 2014. To date, 79 participants completed the survey, 49 participants completed physical activity assessment and we completed data collection on six focus groups. We will continue with intensive participant recruitment through schools, workplaces and communities throughout 2016.

Grant No. 1603
Project Grant
Dr Barry Palmer
Heart disease is a major cause of death in New Zealand, resulting in >30,000 hospital admissions per year. A common and very debilitating form of heart disease is heart failure, where the heart cannot pump an adequate blood supply to the body for normal functioning. Maintenance of arteries and the formation of new blood vessels are associated with improved survival and quality of life in heart failure patients. The VEGF system initiates formation of new blood vessels. Measuring levels of a system component, sVEGFR1, and assaying gene variants from the system show potential for predicting clinical outcome in these patients.

Grant No. 1605
Project Grant
Dr Stefanie Vandevijvere
A national survey of the healthiness of food environments will be implemented in New Zealand. This project will develop and test a complementary approach to: 1) local monitoring through crowdsourcing of nutritional quality of foods in schools, outdoor food advertising, food advertising through sport club sponsorships, and food retail, 2) public rating of the extent of government policy implementation against best practice, and 3) communication about the healthiness of food environments to councils, local MPs, schools and retailers. This will support sustainable monitoring, public engagement, and improved actions at the local level in New Zealand to reduce diet-related chronic diseases.

Grant No. 1606 and 1646
Senior Research Fellowship and
Dr Anna Pilbrow
GPs use the New Zealand Cardiovascular Risk Charts to screen patients for risk of future heart attacks. However, this traditional risk factor profiling fails to identify many high-risk individuals, with more than 50% of heart disease deaths occurring in people considered to be at low-moderate risk. We are working to identify circulating molecules in blood, called microRNAs, that can predict future heart attacks in the general population and lead to better use of preventative strategies in those at risk. We gratefully acknowledge funding for this research from the Estate of Grace E M Kay – Orakau Heart Research Scholarship Trust.

Grant No 1607:
Overseas Training & Research Fellowship
Dr Philip Adamson
Recently developed blood and cardiac imaging tests may significantly improve detection of individuals at high-risk of experiencing a heart attack. This has important implications for both the healthy population and those with known heart disease. In patients presenting to hospital with chest pain we have found the novel use of a simple blood test can rapidly and reliably exclude a heart attack in more that 60%, thereby avoiding costly hospital admissions for further testing. We are now exploring the use of this blood test, along with new heart scanning techniques to better predict the risk of recurrent heart attacks in patients with established heart disease. *Grant Closed.*

Grant No 1608:
Overseas Training & Research Fellowship
Dr Darren Hooks
A one year Fellowship in Electrophysiology at Haut-Leveque Hospital in Bordeaux provided opportunity to learn ablation of cardiac arrhythmia at a world-leading centre. Experience was gained in ablation of complex arrhythmia such as ventricular tachycardia, and atrial tachycardia associated with congenital heart disease. Research was performed in a number of areas while in Bordeaux. Novel ways of ablating persistent atrial fibrillation were investigated, that involve the non-invasive (body surface) mapping of arrhythmia drivers. New ways of defibrillating the heart back to normal rhythm with lower energy than traditionally used were also tested in a first-in-human study. I now use the experience gained in Bordeaux in my job as an Electrophysiologist at Wellington Hospital. *Grant Closed.*

Grant No. 1609
Research Fellowship
Dr Carol Chelimo
At the 2012/2013 NZ Health Survey, childhood obesity occurred in a larger proportion of Maori (19%) and Pacific (27%) compared with European (6%) children, and among children living in more compared with less deprived areas. Environmental exposures in early life (such as, antibiotic use) can change the bacterial composition of the intestine, potentially increasing the risk of obesity. This research project will examine whether frequent antibiotic exposure up to age 4 years is related to having a higher body mass (and increased risk of obesity) at age 4.5 years in children participating in the Growing Up in New Zealand study.

Grant No. 1611
Research Fellowship
Dr June-Chiew Han
The heart has two sides: the right and the left. Given that they are coupled, failure of the right side affects the performance of the left side. This project aims to characterise the performance of the left side using experimentally-induced right-sided failure in the rat. I hypothesise that the left side is not as energetically efficient. That is, the ratio of work output to energy input is severely reduced. I thus design the experiments, both at the heart level and at the tissue level, to reveal the underlying causes of left-sided disturbance in right-sided failure. Unique measurement techniques are employed.

Grant No. 1614
Research Fellowship
Dr Stefanie Vandevijvere
Measuring food environments is being led by New Zealand. With this fellowship, I will develop several innovative components: 1) 'environmental equity' indicators, 2) impact assessments of trade agreements on food environments, 3) crowdsourcing approaches for data collection and public engagement, 4) assessment of community capacity to advocate for healthy food environments and 5) matching New Zealand's progress against international benchmarks. This will allow me to explore the potential of national and local food environment surveys to strengthen accountability and food policy action. It will support my career development and ensure that New Zealand continues to lead this important action-oriented research.

Grant No. 1615
Small Project
Dr Antoni Moore
Active Transport to School (ATS) is a convenient way to sustainably promote physical activity into everyday life. The Built Environment and Active Transport to School (BEATS) Study examines individual, social, environmental, and policy aspects of ATS. A large-scale data collection and analysis programme from students in all 12 Dunedin schools has been spatially processed with a Geographic Information System (GIS). This valuable resource will reveal the existing level of ATS and environmental factors relating to school routes, including distances, route ruggedness, school choice, perceived safety, traffic and land use effects. It provides a foundation for future study and ATS interventions. *Grant Closed.*

Grant No 1616:
Small Project
Dr Karen Munday
This project aimed to encourage children at a low decile kindergarten to eat more fruit, vegetables and dairy products. The children were given a free lunches in conjunction with education and food tasting sessions. They also grew their own vegetables and used them for cooking. A series of cooking classes were organised for their families and whanau. After the intervention, many parents reported that their children's eating habits had improved, particularly that they were more willing to try new foods. The parents also commented that the intervention had a positive impact on others in their family and whanau. *Grant Closed.*

Grant No. 1617
Small Project
Dr Maximillian Pinkham
Heart failure is a leading cause of death and disability worldwide. Current treatments for heart failure are unsuccessful in halting disease progression and new treatments are required. We investigated the effects of cutting the nerves to the kidney (renal denervation) on the distribution and density of nerves in the heart (cardiac innervation). We found that renal denervation attenuates the adverse changes in cardiac innervation in heart failure, consistent with findings that renal denervation improves heart rhythm and function in heart failure. Our findings provide a novel pathway by which renal denervation may be beneficial in treating heart failure.*Grant Closed.*

Grant No. 1618
Small Project Grant
Dr Paula Skidmore
Overweight and obesity in child and adult life is one of the most significant public health issues in New Zealand and worldwide and has lifelong implications for cardiovascular health. The aim of our study, funded by the Grace Craston Charitable Trust was to investigate whether parental positive psychology relates to lifestyle, and dietary quality in particular, and body composition of both parents and children. During 2015 we collected information from 468 children aged 9 to 11 years olds and their primary caregiver, and we are currently analysing this data.

Grant No. 1619
Small Project Grant
Dr Shieak Tzeng
According to conventional wisdom the greatest risk for stroke is consistently high blood pressure, but it has been suggested that the real risk lies in how dramatically blood pressure varies from one time to another. We sought to verify this hypothesis and identify the most sensitive markers of blood pressure variability for neurological impairment. We found that ischaemic stroke causes dramatic elevations in blood pressure fluctuations, and that 'low frequency' fluctuations were the most sensitive predictors of stroke severity. These findings indicate that in addition to lowering blood pressure, dampening low frequency blood pressure variations may be a therapeutic strategy to improve stroke survival and outcomes.

Grant No. 1644
Project Grant
Dr Allamanda Faatoese
The Pasifika Heart study aims to provide the first comprehensive heart health risk factor profile of a Christchurch Pacific cohort. Preliminary findings have shown that 4 out of 5 Pacific participants were originally born in the Pacific Islands and the average age of the cohort was 41 years. The rates of obesity (and morbid obesity), type 2 diabetes, high blood pressure and high cholesterol are still major health conditions for the Christchurch Pacific population. One of the beneficial findings was that over 90% of this Pacific cohort readily accessed primary health care with their Pacific health provider.

Grant No. 1648
Project Grant
Dr Anna Rolleston
Māori are disproportionately affected by CVD and innovative, Māori-centric approaches are required to address this inequity. The purpose of this project is to determine the effects of an exercise and lifestyle-management programme for cardiac risk reduction that is embedded within a kaupapa Māori approach. The project is a controlled trial using kaupapa Māori methods, with a cluster wait-list design. Participants assigned to the intervention are able to redevelop a usual-care cardiac risk reduction programme to embed a Māori worldview. Clinical measures and Maori values are assessed pre- and post-programme.

Grant No. 1663
Small Project Grant
Associate Professor Johanna Montgomery
This research aims to examine the role of nerve cells in regulating heart rhythm in the normal and diseased state. Specifically, we are performing (1) physiology experiments to determine how nerve cells communicate with heart cells, and (2) imaging experiments to visually show the structure of the neurons of the heart and where they form synapses to communicate with each other and with heart cells. To date, we have successfully developed techniques to visualise these neurons in the heart, and our labelling techniques have shown that these neurons form a high density of synapses. These data suggest that neurons within the heart are highly likely to directly communicate with each other to alter heart rhythm. We are now examining whether this communication is altered in heart disease.

Grant No. 1643
Research Fellowship
Associate Professor Nigel Anderson
The project start date was delayed because of staff appointment processes but we still expect to complete the project within original 2 year timeframe. Staffing for the scanning of the plaques is in place. Facilities are available. Ethics has been obtained. The first stream of the project involving 15 non-incubated plaques has started with first plaque scanned on 15 January 2016. The second stream involving 16 plaques incubated with nanoparticles and mouse scanning is/was not intended to start for a few months yet.

Grant No. 1660
Small Project
Professor Vicky Cameron

The Christchurch Heart Institute has recruited a cohort of over 3000 heart-healthy volunteers, randomly selected from Canterbury electoral rolls, to provide samples for discovery of new blood markers to predict future heart disease events. This grant, generously supported by the Lawrance & Stephanie Russell Charitable Trust, is allowing us to perform laboratory testing of known predictors of heart disease risk, such as blood cholesterol levels. This will assist us to evaluate how well our novel risk markers can predict those who go on to have a heart disease event compared with those remaining event free and healthy.