

Genetic Links to Heart Health



Research Nurse Sara Prue

Have you ever wondered if your family history could contribute to your chances of developing heart disease? Or whether your living environment is causing your heart to suffer? A study led by the Christchurch Heart Institute's Professor Vicky Cameron and Associate Professor Malcolm Leggett of the Auckland Heart Group attempts to answer these questions.

The Multi-Ethnic New Zealand Study of Acute Coronary Syndromes (MENZACS) focusses on people aged from 18 years upwards who have had their first coronary heart disease event, ie, a heart attack or have unstable angina, with a particular emphasis on recruiting Māori and Pasifika.

Professor Vicky Cameron, Head of the Genetics and Molecular Biology laboratory at the CHI said, "We are trying to get a picture of the main risk factors that contribute to heart disease in Māori and Pacific Islanders, and if these differ from other New Zealanders. This includes what influences their likelihood to recover well or to have further heart issues, by looking at genetics and lifestyle risk factors, including diet and exercise."

The collaboration between Auckland, Christchurch, Waikato and Middlemore hospitals began in March 2015 and today 640 people are taking part in the study. The figure continues to rise with the aim of reaching 3000 participants over five years. Christchurch has the fastest rate of recruitment in the country, currently sitting at 193.

"Our success in attracting participants is due to our highly effective study co-ordinator, Sara Prue," commented Vicky.

Sara Prue has been study co-ordinator on MENZACS since March 2016. She works closely with Clinical Lead Investigator, Professor Richard Troughton, the Cardiologist who oversees patient care, and recruitment.

"On average I sign-up seven people a week," Sara explained, "It's fascinating to see the link that genetics appears to have. For example, a father and son enrolled in the study last year, and recently a current patient's son, who is in his 40's, received a heart transplant. This underlines the genetic element to heart disease."

Study analysis will start when national recruitment has reached 1000 participants. Once people are in the study they are de-identified to create anonymous profiles of risk factors.

"The study links to the National Science Challenge, Healthier Lives," said Vicky, "This aims to reduce inequalities in non-communicable diseases such as, heart disease, cancer, diabetes and obesity. The MENZAC study is trying to understand where the inequalities lie in patients with heart disease. We will compare results between the population groups (Māori, Pasifika, NZ European and others) to evaluate the different links between lifestyle factors, heart disease and genetics."

The study is funded by the Heart Foundation of NZ.

Breathlessness - It's Significant

Most of us have been there, struggled through a viral illness causing us to be breathless and lethargic. Or you may be asthmatic. A visit to the GP usually sorts out the symptoms, but what happens if that shortness of breath persists? Weeks after the virus or asthma attack has gone you find you are out of breath when doing everyday activities such as, walking upstairs or carrying something heavy. It's time to take this more seriously.

Lingering shortness of breath in anyone of any age could indicate heart failure. The good news is that patients presenting with shortness of breath at Christchurch Hospital's Emergency Department, and whom become inpatients, are potential candidates for taking part in the Christchurch Heart Institute's heart failure study, known as SIGNIFICANT-HF. The study, led by Associate Professor Chris Pemberton, aims to determine if the symptoms are of respiratory or cardiac origin.

Participants are monitored over a three month period, giving blood samples on the day of discharge, and at 30 and 90 days after leaving hospital. The blood is tested for the presence of heart hormone NT-ProBNP, which is present when the heart is under stress.

Study co-ordinator, Research Nurse, Ruth Jardine said, "With any shortness of breath, our heart rate increases. If the heart is not functioning as it should to cope with this increase, NT-proBNP, will be released by the heart muscle, indicating possible heart failure."

If heart failure is diagnosed, suitable medical attention can improve symptoms.



Research Nurse, Ruth Jardine, with a patient.

"Shortness of breath as an indication of heart failure can affect young and old people. A young person who has had a severe viral illness may have heart failure, just as an elderly person with COPD."

That's unsettling to hear but, reassuringly, through this study the opportunity for early diagnosis and, therefore, effective medical intervention, can reduce harm to the heart and improve symptoms.

Ruth had a few words of advice for everyone, "Take shortness of breath seriously. It's not normal to struggle to breath during everyday activities."



The Vikings are Leaving!

back: Mike Sommer front: Adam Runesson

The Christchurch Heart Institute prides itself on many international connections, not least, supporting young researchers.

In February, Dr Anna Pilbrow and Professor Vicky Cameron were delighted to welcome two Swedish third year medical students from Linkoping University, south of Stockholm, to the Molecular Biology and Genetics team.

Adam Runesson and Mike Sommer have spent the past five months with the CHI, carrying out the research component of their medical training, studying new markers for predicting risk of heart disease.

Mike and Adam looked at the involvement of a genetic material called microRNA in heart disease. Adam investigated whether some microRNAs specifically indicate the presence of coronary heart disease, while Mike studied how levels of these microRNAs change in the blood over time.

Dr Pilbrow said, "Adam and Mike have been working on a project that aims to identify new blood markers to predict who is at risk of a future heart attack. We are delighted to have had them with us and wish them all the best with their medical training in Sweden."

In the general population, screening for heart disease events is performed in primary care using the 5-year Cardiovascular Risk Charts, which incorporate traditional risk factors such as age and smoking. However, traditional risk factor profiling fails to identify many high-risk individuals, with approximately half of heart disease deaths occurring in people considered to be at moderate risk.

"Our research, which is funded by the Heart Foundation of New Zealand, aims to find new blood markers that improve assessment of heart disease risk in the community. This may deliver new blood tests, leading to better monitoring and use of preventative strategies in those at risk," said Dr Pilbrow.

"Our part of the research seems to have gone quite well," explained Adam, "The microRNAs that I have been looking at might not be entirely specific to cardiovascular disease but can be linked to inflammatory processes. This will help us identify how those microRNAs are involved in heart disease and whether they will be useful biomarkers for predicting future cardiovascular events."

Mike's research has confirmed the results of a pilot study that Dr Pilbrow conducted previously.

"My study found that two particular microRNAs might predict near future cardiovascular events, although we need to do more work to see whether they add value to existing cardiac biomarkers that are in regular use today," he said.

According to Dr Pilbrow, these findings are helpful because they enable the prognostic potential of microRNAs to be compared with the CHI's current diagnostic biomarkers, while providing insight into the role of microRNAs in cardiovascular disease.

We are trying to come up with ways to improve how we assess your risk of heart disease, before the onset of symptoms. This would enable us to make better use of preventative strategies in those at risk and reduce heart disease in New Zealand."

The study results will eventually appear in a joint publication between Dr Pilbrow, Prof Cameron, Mike, Adam and other members of the CHI team.

According to Adam, the possibility of his work being published is an absolute bonus, while his long-time interest in science has been fueled by the experience. Although Mike has enjoyed his time conducting research with the CHI, he feels being a medical doctor is more his style.

The pair have managed to squeeze many trips around the South Island including walks in the Abel Tasman, part of the Routeburn track and Milford Sound. A highlight of their New Zealand adventure has been a tandem experience of The Nevis Swing, the world's biggest swing with an arc of 300 metres.

"There is more we want to see of New Zealand, we'll be back!" said Mike.

Adam agreed, "It has been very good, we have enjoyed the entire country and people. Thank you for having us, we are going to miss everyone. It has been a great opportunity."

Mike and Adam, we wish you well for the rest of your medical training and hope you return here soon.

We invite you to donate and/or bequeath to the Christchurch Heart Institute. If this is something you would like to do or find out more about, please contact Lorraine Skelton, Clinical Studies Co-ordinator on **03 364 1063**, email: lorraine.skelton@cdhb.health.nz.



Please post a cheque, or direct credit our bank account **02-088-0877177-00** – with your name as a reference. If you would like a receipt for either a cheque or direct credit, return the slip below to us, including your address details.

The Nicholls Clinical Research Centre,
Otago University Christchurch Medical School,
PO Box 4345, Christchurch 8140

First Name: _____ Last Name: _____

Yes, I want to help research into cardiovascular disease.

I am making a gift of \$20 \$40 \$60 or my choice

A cheque is enclosed payable to the Christchurch Heart Institute Trust

I have paid by direct credit to your bank account

Heart 2 Heart



Newsletter of the Christchurch Heart Institute | June 2017



Professor Mark Richards, Director, Christchurch Heart Institute.

Today's modern technology, although at times a cause of frustration, has changed the way we work, from the equipment used to analyse blood samples in the lab, to where we are located, using computer links to interact with colleagues anywhere on the planet.

I live and work in Singapore for 6-9 months per year. That's a very long way from Christchurch, but I manage to halve my time between my roles as Director of the Christchurch Heart Institute and Director of the Cardiovascular Research Institute of Singapore. I spend a lot of time travelling the globe, meeting with eminent scientists associated in various ways with the study of cardiovascular disease. We share ideas and data, which is a vital part of improving heart research results everywhere.

When I identified the need for a research professor to head up the preclinical department at the Institute in Singapore, Chris Charles was the obvious candidate. The draw card was, perhaps, the chance to put his extensive experience and skills into practice in an environment not hindered by funding issues. The knowledge he brings to Singapore is invaluable and in return, the Christchurch Heart Institute will reap the benefits of his additional experience as a result. We say hello to Chris in this issue of Heart 2 Heart and find out how he has taken to life in Singapore.

Working with ethnic groups, be that Asian, as in Singapore, or Maori and Pasifika in New Zealand, is vital in understanding the various elements that influence heart health in these populations. The MENZAC study being run by the CHI under the leadership of Professor Vicky Cameron, aims to build a picture about the main risk factors that contribute to heart disease in Maori and Pacific Islanders. This includes looking at genetic and lifestyle influences. The study links to the National Science Challenge known as Healthier Lives which aims to reduce inequalities in non-communicable diseases.

I am proud of the reach the CHI has across the globe. Thanks to the relentless hard work of each member of our 45 strong team, our work is world renowned, with medical tests resulting from our research being used to diagnose heart issues in America, Asia, Europe, the United Kingdom, as well as New Zealand. Young doctors considering research or undertaking the research component of their training are being attracted to the CHI. We have had the pleasure of hosting two Swedish medical students for the past five months for just this purpose and they talk to us in this newsletter about their experience and future plans.

The CHI is constantly looking for new blood biomarkers to help point the way towards ever increasingly accurate and fast diagnosis of heart disease or related issues. We are very grateful to all our study participants for being willing to share this journey with us, without whom, we would have nothing to research!

I wish you well for the coming winter months – stay warm.



Professor Mark Richards

Five minutes with..... Research Professor Chris Charles

Almost one year ago, Professor Chris Charles, swapped the Christchurch winter for hot and humid Singapore, to join Professor Mark Richards at the National University Heart Centre Singapore. Having been joint head of the CHI's preclinical lab for more than 28 years and with his children moving on with their lives, Chris and his wife, Mareta, decided it was time for a different challenge. In September 2016 he began a three-year contract as Research Professor with the Department of Surgery and Cardiovascular Research Institute (CVRI), National University of Singapore, while continuing a long distance role overseeing the CHI preclinical lab, with colleague Associate Professor Miriam Rademaker.

We find out how he is getting on

What is your role at the National University Heart Centre Singapore?

As a Research Professor my specialty area is to instigate and oversee high quality research into cardiovascular disease particularly bridging the gap between lab based "bench" studies and clinical "bedside" research. This is known as pre-clinical research and is a key step in translating basic biomedical science discoveries into the clinic.

How did you land this job?

This position is very similar to my role in the Christchurch Heart Institute (CHI) for nearly three decades, thus my expertise was a perfect fit. What's more I was a "known quantity" to Prof Mark Richards who has a joint role of Director of both CVRI Singapore and CHI Christchurch. You could say I was the subject of "targeted recruitment" with Mark enticing me to the challenge of an exciting new role in a research intensive and relatively well funded environment whilst maintaining strong links with my "beloved" CHI and Christchurch.

What do you find the most challenging and most rewarding about the role?

Most rewarding is getting to work alongside very talented and motivated clinicians and scientists both within CVRI and in the wider Singapore community. There seems a never ending supply of excellent novel research ideas, talented people and good access to facilities and funds to see many of those ideas to fruition. It should be noted that I continue to appreciate the great talent of people I have and do work alongside at CHI and remain proud of what we continue to achieve with relatively less resources. Most challenging is learning a whole new "bureaucracy" - in Christchurch I know most processes intimately so was adept at getting things done very efficiently - a whole new ball game here in Singapore, but I am a quick learner who seeks out the smoothest possible way to get things done.

Where do you see your work heading?

We are busy developing new models of heart disease to better understand the "under-studied" group of heart failure patients who have preserved ejection function, i.e. their hearts maintain ability to pump out good volumes of blood but their hearts function below par for other reasons.

We also have some excellent research "toys" here in Singapore such as high quality echocardiography and MRI scanners so a lot of our work centres on pushing the boundaries of what state of the art imaging can contribute to our understanding of heart disease.

Could you describe how it was for Mareta and yourself settling into Singapore?

First impressions on moving here to live, hot and sticky all the time (except thankfully virtually every enclosed space is air-conditioned including buses and trains). This means you have to learn how to slow down when walking outside - you can't walk at NZ pace as the throngs of people around you saunter (out of necessity). Apartment living and not owning a car is also very different but was not difficult to adjust to. Singapore is perhaps the most western of all Asian cities and is very clean and safe hence it is very easy to live and function.

What is the expat lifestyle like in Singapore?

Singapore is a truly diverse mix of cultures mainly Chinese, Malay and Indian, with 30% of the 5.7m population being "foreign" and approximately 600,000 of these "expats". As an expat, you can enjoy Singapore's diversity and its luxurious lifestyle. It doesn't have to be all luxury though, there's something for everyone (and every budget). Conspicuous consumption in the form of shopping and eating is a Singapore norm, and firmly features in both local and expat lifestyles - opportunities abound across the spectrum from a \$3-4 meal at a local hawker centre (think open-air food court) to high end restaurant, bars and clubs that can mix it with the best in the world...with costs to match.

What do you enjoy doing in your spare time?

We spent our first 3-4 months exploring different neighbourhoods, sights and attractions of Singapore. Despite the heat, parks and trails are packed on weekends with people riding bikes, jogging and enjoying the weather - we quickly learnt that you must always carry an umbrella and water bottle(s). We are also starting to explore the wider SE Asia region, booking long weekends to the beautiful beach resorts and other amazing destinations that are a short flight from Singapore.

..... Ok, now you're just showing off



Just wondering ...?....

How many people are coping with heart disease in NZ?

More than 172,000 New Zealanders live with heart disease.

How many New Zealanders die from heart disease each year?

One New Zealander dies every 90 minutes

How can I lower my risk of heart disease?

The basics are: stop smoking, do regular exercise (even 30 minutes a day makes a great difference) and eat healthily. If you have high blood pressure, high cholesterol, are overweight or have diabetes, you need to ensure these are monitored regularly by your GP who will advise you further.

Did you know

The Heart Foundation website is a great place to find answers to some of your heart health related questions

www.heartfoundation.org.nz

Supporting the journey to recovery

A newly launched website called Journeys has been created by the Heart Foundation in response to research findings revealing those who have experienced a heart event can often feel alone, worried and unsure of how to cope afterwards.

The Journeys website is based on the insight that sharing personal stories truly aid a patient's journey to recovery.

- The Journeys website tells the personal stories of those affected by heart disease, presented in an online catalogue format
- Journeys offers local support through Heart Foundation branches nationwide, including talks with experts and shared personal stories
- Journeys will connect with heart patients through newsletters and information resources

Have a look at: www.heartfoundation.org.nz/journeys or call **0800 863 375** for more information.

Upcoming public talks at the Heart Foundation

The CHI will be running a series of talks in the coming months. To be held at the Heart Foundation, Christchurch, the talks will cover aspects of heart research as well as clinical applications and links to the National Health Challenge.

We will keep you informed of dates and talk titles by email, post and on our website: www.otago.ac.nz/chch-heart-institute/news/index.html.



We welcome Consultant Cardiologist Geoff Clare who joined the CHI team in April.

A New Zealander, Geoff trained in medicine through the University of Otago. He has spent several years in the UK but has returned to NZ with his family to take up a Cardiology clinical, teaching and research role. Geoff brings expertise in the specialist area of electrophysiology - disorders of the electrical activity of the heart.



Leaving a Legacy

When Wayne Braithwaite learnt he was terminally ill with melanoma, he made a decision. He decided that after his passing he would bequeath a gift of funds to the Christchurch Heart Institute, knowing this will go towards research into heart disease that will help others now and into the future.

His wife, Pamela, recently presented the gift to Professor Mark Richards, Director of the Christchurch Heart Institute.

"We are extremely grateful to Mr and Mrs Braithwaite for this generous gift. All donations to the CHI go towards making it possible in keeping the research on track. This and future generations will benefit from the extensive studies that are being carried out by the team.

Vital Vegetables

Vegetables are an often neglected, yet very important, group of foods. Eating 3+ a day of vegetables and 2+ a day of fruit is associated with lower blood cholesterol and lower blood pressure. In addition, 10+ a day is associated with lower risk of heart disease.

Vegetables are an important source of dietary fibre, vitamins and a range of phytonutrients. Vegetables are also a filling low energy food which can help us to manage our weight throughout our lives.

The new Heart Foundation healthy heart model encourages us to "eat most" of vegetables and fruit. To help us eat a healthy amount of vegetables everyone should aim to fill half their plate with non-starchy vegetables. We should not reserve vegetables just for the main meal - vegetables can be a tasty part of both lunch and dinner. Eating a range of coloured vegetables, using a variety of cooking methods and trying new flavour combinations can help to make vegetables more appealing.

Happy eating!

Catherine

Catherine Wall, NZ Registered Dietitian

Annabel Langbein is a keen gardener and a great advocate for eating more vegetables. Her cookbooks often include plenty of tasty, healthy dishes to help us eat more vegetables every day.

This particular recipe of Annabel's is one of my favourites. Beetroot is versatile. It can be eaten raw or cooked and is packed full of phytonutrients. Roasted beetroot keeps well in the fridge for up to five days, so can be added to main meals throughout the week to help you eat that half plate of vegetables. It is also a great addition to salads or as a side at lunchtime.

For more delicious recipes visit <http://www.annabel-langbein.com>

With this knowledge we aim to increase the survival rate from heart disease and minimise its impact on individuals and families," said Professor Richards.

Wayne's father had suffered heart attacks and had received heart bypass surgery.

"Wayne hoped that his bequest will help other people gain the benefit of (the CHI's) research," commented Pamela, describing her husband as respectful, dignified and a gentleman, who was quiet, loyal and kind.

"With a passion for Ford motor vehicles, country music and high end technology, he was very practical and had amazing attention to detail," she said.

That attention to detail carried through to the end, with his consideration about how he could help others through bequeathing.

"It was important to Wayne that the money bequeathed was used locally and could benefit a range of people in Canterbury. Particularly groups that rely on grants, bequests and donations. Wayne was interested in research in many forms - he was a skilled researcher himself."

According to Pamela, once the decision was made the process of bequeathing was straightforward.

"We contacted our lawyer and the bequests were recorded in his Will. I recommend people bequeath if they are in a position to do so. It is wonderful to know that Wayne's choice will have a positive impact on many people, as he did when he was still with us. People enjoyed his sense of humour, what he said was worth listening to and he was always there for his family. He was a good and decent man."

Pamela, we think so too - and thank you.



© Annabel Langbein A Free Range Life, Winter 2015

Annabel Langbein's Roasted Beets with Fennel and Orange

6-8 beetroot, peeled and each cut into 8-10 wedges
2 tbsp extra virgin olive oil
1 tbsp red wine vinegar
1 tbsp soft brown sugar
1 tsp finely chopped or crushed fennel seeds
finely grated zest of ½ an orange
salt and ground black pepper, to taste

1. Preheat oven to 180°C fanbake and line a large, shallow roasting dish with baking paper.
2. Place beetroot in dish with other ingredients and toss to coat evenly. Spread out in a single layer and roast until tender and starting to shrivel (about 45 minutes).
3. Serve hot or at room temperature. If not using immediately store covered in the fridge for up to a week. Bring back to room temperature or reheat to serve.