Heart 2 Heart 9

Newsletter of the **Christchurch Heart Institute - *A University of Otago Research Centre***
December 2019

2019 has seen great change and growth at the CHI. We have lost some valued colleagues and gained some new ones. The team is consolidating its strength with our young researchers developing their knowledge, skills and expertise under the mentorship of lead CHI investigators.

This is important because as time marches on, sooner or later leadership roles must change hands to the younger generation. As director of the CHI, I am keen to ensure this isn't overlooked and that we are actively responding to the individual professional development of team members, as well as sustaining our efforts and productivity in relevant bioemedical science. The Heart 2 Heart newsletter is an opportunity to showcase different research being carried out by the CHI team. In this issue, Dr Phil Adamson and Dr Moritz Lassé discuss projects for which they have recently received Heart Foundation grant funding.

Meanwhile, Dr Andree Pearson is leading an investigation into the heart health of elderly in retirement villages. Known as CHAMPIONZ, this NZ first study was initiated by Associate Professor Chris Pemberton in collaboration with Ryman Healthcare.

Senior Research Fellow Tim Prickett leads the charge for the CHI in the CHALICE study's cardiovascular component. In a recent paper published in the international journal, *Scientific Reports*, Tim has shown that low levels of the hormone in healthy people can indicate potential future heart issues, but people with higher levels are at less risk. We learn more in this issue.

We also meet Senior Research Technician, Sara Rausepp, who keeps life interesting at work, where she says no day is the same as the one before, and by spending time in the outdoors as often as possible. We chat to Sara about science, StarLims and Shihad.

As another year draws to a close, I find myself reflecting on the enormous time and effort that has gone into the success of the CHI by each member of the team. Our nurses do an invaluable job in the Nicholls Clinical Research Centre. They are the first point of contact for many of our study participants and without their care and expertise, the researchers would find it very hard to conduct any studies at all. Thank you to the nurses – and save me some of that home baking! Thank you to all the lab technicians who provide support in the fine details of lab work and who make life so much easier for researchers to lift their studies to new levels. My thanks goes to each member of the CHI team. All are experts in their field and all contribute meaningfully to heart research, now and towards the future.

Last, and certainly not least, my deep gratitude to our study participants. Thank you for your generosity in taking part in the studies, we couldn't do it without you.

May you all have a very Happy Christmas and successful New Year.

Professor Mark Richards

Professor Mark Richards, Director, Christchurch Heart Institute.

Five minutes with ...
Sara Rausepp

The CHI's biochemistry and cell biology team are found in the Translational Biodiscovery Laboratory. Their role is to develop new and interesting blood analysis and tests, called biomarker assays, for the diagnosis and prognosis of cardiovascular disease and to explore mechanisms underlying cardiovascular disease to point the way to new treatments. For the scientists to carry out their work efficiently, they rely on the expertise and support of lab technicians. Sara Raudsepp is a Senior Research Technician who manages the team of technicians and the laboratory. We find out what her role involves and what else puts a spring in Sara's step.

How did your career in science begin?

I came into science straight from school in 1987. I didn't know what I wanted to do but spotted a job advertisement for a technician in immunology with Pearson Laboratory and thought it sounded quite interesting. I loved it and never looked backed. Pearson Laboratory changed over time to become Medlab South (closed down after contract testing awarded to Southern Community Laboratory).

In 1998 you joined the CHI, which was then the CardioEndocrine Research Group, what was the focus of your role?

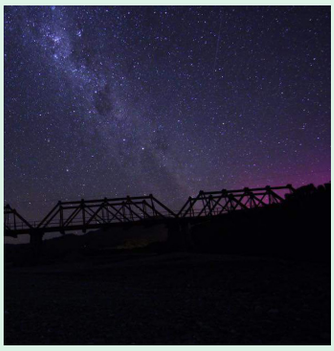
Early on I worked under the guidance of Professor Tim Yandle who headed-up the lab. It was pretty routine lab support, working with the natriuretic peptides, which had been discovered by the team in the 1980's. My focus changed from routine to simplifying research techniques and upgrading them to save time. It was trial and error, testing known methods to determine if they would work for other biomarkers.

Later, you topped up your qualifications...

Yes, during the earthquakes of 2010-2011, I did a postgraduate diploma in Health Science. Classes were held at Beckenham Bowling Club because University of Otago Christchurch was shut, due to damage. It was cold – boy it was cold! But there was lots of car parking!

Could you tell us about your role today?

It has evolved over time. I love my job. It is diverse with no day being the same as the one before. I am involved in assay (test) development, lab management, Biorepository management – a bit of everything. I love mostly the research and development. Coming up with a theory – usually collaboratively with a colleague – and turning that theory into a practical experiment - looking at what's happening in a tube of liquid – the magic that unfolds.



Nothing I do is on my own. I'm part of a team. Scientist, Dr Lynley Lewis and I work closely together. At the moment I am measuring samples in assays we have developed to measure proBNP and its fragment forms, NT-proBNP and BNP, to investigate why in some people with heart failure, the bioactive form of BNP is not present to the same degree as other people with heart failure.

Sara Rausepp

What are you currently working on?

A very unusual case study of a Japanese patient has come to our attention. The person has left ventricular hypertrophy and spuriously high levels of BNP and NT-proBNP. The research suggested that the high results were actually macro-proBNP, an immune complex of proBNP and anti-proBNP antibodies. With guidance from Associate Professor Chris Pemberton, I have developed some assays to try and detect this type of rare auto-immune response by the body that masks or interferes with blood test readings.

As well as the lab work I have spent a couple of years helping to set up our new database system that contains all our results and sample Biorespository. Remembering that I am not a database or computer person, and StarLims is not intuitive, it was a nightmare at the time, but glad to say between Database Manager, Barbara Neame and I, we have it working for all we need now, (I'm still possibly a little crazy after that).

What do you do for a little light relief away from the lab?

I go with my husband (kids don't want to come any more) on holiday quite a lot – once every 6 weeks or so. We usually go to the West Coast or MacKenzie District – walking, night sky gazing, relaxing. My favourite part of NZ is around Twizel. The local people are really friendly and the scenery never fails to amaze me. The night sky is astonishing. I don't think you realise what you're missing when you look up, until you are away from all the artificial light ruining our dark skies. We have spent many hours, in the dark, photographing the night sky and Aurora Australis. We also don't miss the chance to attend a good music concert, in a stadium, in a forest, in a winery, anywhere in NZ. This year we've seen Shihad, Fat Boy Slim, attended the Gibbston Valley Winery concert and we're booked to go to U2 in November.

Work, concerts, getting out and about in NZ – I love it all!

Inspired health

When Meg Christie saw an advertisement in the CDHB's CEO Update newsletter asking for healthy volunteers for a study called INSPIRE, she jumped at the chance to take part.

"I was curious about my own health and wanted to contribute to medical research," she explained, "I'm not asked to do anything too horrendous – only give some blood once a year, blood pressure and the body composition analysis. That part is very pleasing, since it shows I am 15 years younger than my actual age of 58!"

Meg puts the impressive figure down to a conscious effort to be fit. Following a serious road-bike accident that prevented her from exercising for several months, Meg, a health promoter with the Canterbury District Health Board, now enjoys yoga, running and is back cycling.

In addition, Meg keeps fit in the garden. Pruning fruit trees is a particular talent.

"We have 40 fruit trees on our 2023sqm section in Beckenham. They are very old heritage trees, such as feijoa, plum, fig, apple and pear."

The garden is home to 37 varieties of vegetables including broccoli, silverbeet, cauliflower, celery and white carrots.

Meg and her husband, John, divide up the tasks between them but see time spent in the garden as recreation and "a natural gym".

Meg Christie

Eating well and being active is essential for overall health. It wards off heart and other disease such as diabetes, which is where the INSPIRE study comes in.

INSPIRE tests a new potential marker of insulin and pancreas function. Discovered by, scientists at the CHI, the insulin single peptide (INSsp) marker compares insulin production in healthy volunteers with those in the study who have or are at risk of developing diabetes. Diabetes can lead to many other health issues, including cardiovascular disease.

Meg is pleased to be contributing to this important study, "Being part of medical research is important. I get something out of it, by having my health regularly monitored, as well as giving to the body of knowledge. I highly recommend taking part in a study. The staff take very good care of you. And I highly recommend being active and eating well – it's a great foundation for health."

Chalice bearer

Grow old along with me! The best is yet to be.... Never have the words penned by poet Robert Browning in 1864 had such global resonance. We stand on the cusp of a demographic milestone; for the first time in recorded human history the number of people aged 65 years or older will soon outnumber children aged under 5 years.

These poignant words are from the Canterbury Health, Ageing and Life Course (CHALICE) study paper published in the New Zealand Medical Journal on 31 May 2013. They capture the essence of the purpose of this longitudinal study, involving a wide range of relevant health research areas. The research, gathered in a comprehensive health database from a cohort of healthy 49-51 year-olds, will inform new directions in healthcare, aiming to support the ever increasing numbers of older people.

Senior Research Fellow Tim Prickett leads the charge for the CHI in the CHALICE study's cardiovascular component. In a recent paper published in the international journal, *Scientific Reports*, Tim examines the relationship between the levels of natriuretic peptide heart hormones, including BNP, in the blood and cardiovascular risk.

"We have found that BNP is strongly linked to the development of cardiovascular disease in later life. In middle aged people without heart disease, the authors find that lower levels of the heart hormone BNP are associated with a large number of risk factors, such as high blood pressure, obesity and high cholesterol – indicative of high cardiovascular risk.

Those people with higher levels of BNP in the blood are protected and have a healthier circulation."

The authors also found that a genetic mutation - known to raise blood levels of BNP in normal healthy people and reduce heart disease - contributed to the higher levels in their study population.

"These findings suggest that genetic factors play an important role in regulating BNP secretion from the heart and confer benefits to cardiovascular health throughout life," Tim said.

Whilst doctors have long known that blood levels of BNP are markedly raised as the pumping action of the heart begins to fail, the impact of BNP levels on conventional risk factors of cardiovascular health in healthy people was unknown.

"The relationship between raised BNP in healthy people and ideal cardiovascular health, likely results from the blood pressure lowering effect of the hormone, as well as, actions reducing fat formation."

These findings have significant implications for ageing populations, providing insight into how BNP could potentially play a part in helping to reduce incidents of cardiovascular disease.

Detective Work

Dr Moritz Lassé

Research Fellow Dr Moritz Lassé, has been awarded a Heart Foundation small project grant ($14,050) to help detect kidney damage occurring during worsening heart failure.

The heart and the kidneys work closely together so when one gets damaged the other can too. The problem is, there is currently no way of knowing whether kidney function is rapidly changing when a person first presents to the hospital, making it difficult for early detection of active kidney damage accompanying from the heart failure event.

"Damaged kidneys filter less creatinine out of the bloodstream resulting in an increased concentration in blood. The biggest hurdle clinicians face is that approximately 50 per cent of patients admitted to hospital with heart failure have not had a recent creatinine blood test, so it is impossible to know whether the first result reflects stable or changing kidney function making it a challenge to provide optimal care for people with acute heart failure," says Dr Lassé.

Dr Lassé plans to adopt a technique forensic scientist's use to measure drugs or toxins in the body by measuring molecules in the hair.

"Our test of measuring past kidney function, by looking at a single hair, will benefit all Kiwis. In New Zealand, heart failure is a leading cause of hospitalisation in adults over 65 years of age and about a quarter of these patients will have kidney damage and nearly double the risk of dying within a year. Having a better grasp of past kidney function will improve clinical decision making which will hopefully improve a patient's quality of life and their chance of survival," says Dr Lassé.

Dr Lassé says providing clinicians with a diagnostic tool to establish baseline or background creatinine would lead to earlier and more accurate detection of deteriorating kidney function, facilitate better decision making and thereby improve patient outcomes.

"The small project grant from the Heart Foundation will provide a great kick-start for this project! The funding will allow us to gather important pilot data to establish whether our idea is feasible. Without the generous support from all the donations people give to the Heart Foundation, we could not undertake this project."

With gratitude

Our sincere gratitude goes to the Hugo Trust for the generous and kind donation of $5,000 which was received earlier this year.

The donation came as a result of study participant, Lois Hodder, suggesting to the Hugo Trust that the CHI would be a worthwhile candidate for donation.

"My nephew, Mark is married to Hugo Trust founder, Maryanne," explained Lois, who is a Friend of the Hugo Charitable Trust, "I have been in the IMPERATIVE-HF study for quite some time now, and am in the Sodium trial too. I talked to Mark and Maryanne about the Christchurch Heart Institute and all the wonderful heart research that goes on and they decided to donate."

The Hugo Charitable Trust was established by Maryanne Green on 1 June 2017 with a capital of $75 million to continue the philanthropic legacy of her father, Hugh Green. Since then Hugo has donated just over $6.5 million to 190 charities and causes.

"We greatly appreciate being chosen to receive a Hugo Trust donation," said Cardiologist, Professor Richard Troughton, "The costs of research are very high. As a registered charity, the Christchurch Heart Institute, welcomes all donations and bequests. Without this generosity, it would be very difficult to maintain our globally renowned research."

CHI Director, Professor Mark Richards agrees, "We are always very grateful for any donation. Without funding, the studies would not exist and the public would not benefit from the resulting advances in diagnosis and treatment of cardiovascular disease."

Researchers apply for funding from organisations such as the Heart Foundation, the Health Research Council and Canterbury Medical Research Foundation.

Professor Richards said that the requirement for funding is a constant burden and one that takes up a lot of the researchers' time, preparing grant applications in the hope of being awarded funds.

"That is why donations and bequests from the public are essential and so gratefully received. I wish to express my personal appreciation to the Hugo Trust for their donation, and to Lois Hodder, for kindly suggesting to the Hugo Trust that the CHI be a recipient."

Lois Hodder

Championing the elderly

Raising the standard of cardiovascular care in New Zealand's retirement sector, is the focus of a New Zealand first, joint initiative between Ryman Healthcare, The Heart Foundation and the Christchurch Heart Institute.

Known as CHAMPIONZ, information from the research will provide a clearer picture about the burden of cardiovascular risk and established cardiovascular disease in New Zealand's residential retirement population.

Associate Professor Chris Pemberton of the Christchurch Heart Institute, who initiated the study, said the residents, the aged care sector, Ministry of Health, general practitioners and the primary health sector in general, will benefit from the findings.

"As our population ages, the retirement lifestyle and care sector is growing at an ever increasing rate. We don't have a very good handle on what the cardiovascular health of the sector as a whole is like, and how this relates to our aging population in general. Our goal from CHAMPIONZ is to provide an accurate representation of this important area. This is with a view to helping inform policy surrounding the ongoing cardiovascular needs for retirement village and health providers, at all levels of care. "

Dr Andree Pearson, who is leading the study, has started collecting medical data from residents of the seven Ryman retirement villages in Christchurch.

"We have had 234 completed questionnaires returned to us. From these, we randomly select volunteers to attend clinics at the Nicholls Clinical Research Centre where they have an ECHO, ECG, frailty score, grip test, walk test and bloods taken," Dr Pearson said.

The blood tests will be used to look at known characteristics, or indicators (biomarkers), of cardiovascular disease including new biomarkers the CHI is developing.

"Information on biomarkers in people over 70 years-old is much scarcer than in younger people, so this is important work to find out how good our current biomarkers are in older people. We can also compare with ECHOs and ECGs and traditional risk factors such as fat and cholesterol, as well as do a survey of what ECHOs in healthy older people and those with cardiovascular risk and disease look like."

From early 2021 a team will recruit participants from Ryman villages in Auckland and the project will gradually roll out to other Ryman villages across the country. The aim is to enrol more than 500 participants into the study.

Ryman residents who volunteer to take part in the study will gain awareness of their overall health and cardiovascular risk, and become more empowered to manage that in concert with village healthcare teams and their own GPs.

Go Nuts!

Nuts are not only delicious but they are also nutrition powerhouses. They promote heart health by being high in unsaturated fats and lower in saturated fats, therefore helping to keep your cholesterol in check.

They're high in fibre, which helps block some cholesterol being absorbed into the blood stream from the gut. Plus, they're filling, you can eat them on their own as a snack, or they make a great addition to both sweet and savoury dishes. All nuts are good. It's best to choose unsalted options as salt can raise blood pressure. Where possible, go for the kind with their skins still intact, as they contain more nutrients.


www.nadialim.com

Look at all of the different nuts available to choose from almonds, macadamias, brazil nuts, cashew nuts, chestnuts, hazelnuts, pistachios, walnut halves, peanuts.

Check out this Nadia Lim recipe - Savoury Nut Scatter – it's sure to add some "pop" to a Christmas salad (or any salad)!

Eva

Eva Mieklejohn,
Registered Dietitian

Savoury Nut Scatter

Recipe by Nadia Lim

coriander seeds **1 ½ teaspoons**
cumin seeds **1 ½ teaspoons**
fennel seeds **1 teaspoon**
curry powder **1 teaspoon**
olive oil **2 teaspoons**
garlic **2 cloves, finely chopped**
lemon **zest of ½**
rosemary leaves **1 teaspoon finely chopped**
raw macadamia nuts **½ cup chopped**
raw cashew nuts **½ cup chopped**
smoked paprika **½ teaspoon**
flaky sea salt **1 teaspoon**
ground chilli or chilli flakes **good pinch**
maple syrup **1 tablespoon**

Method

1. Crush coriander, cumin and fennel seeds in a spice grinder or mortar and pestle and mix with curry powder.
2. Heat olive oil in a medium fry-pan on low-medium heat. Add garlic, spice mixture, lemon zest and rosemary, and cook, stirring, for 1-2 minutes until fragrant.

   Add nuts and continue cooking, stirring to coat everything nice and evenly, for a few minutes to lightly toast the nuts.
4. Add smoked paprika, sea salt, chilli (if using) and maple syrup – the maple syrup will bubble away. Stir to coat everything and keep cooking for a further 1 minute or so. Turn off heat and transfer to a dish or bowl to cool completely and go crunchy before storing.

Safer medication

Kiwi researchers are trying to find out how long to give blood-thinning treatments to heart attack survivors.

Heart Foundation Grant Recipient 2019

Thousands of New Zealanders take blood thinning medications to reduce their risk of heart disease, but the drug's blood-thinning action carries a potentially fatal risk of causing internal bleeding.

The Heart Foundation funded research, ($147,254), led by the CHI's Dr Philip Adamson, Consultant Cardiologist and Researcher, will try to reduce the harm caused by such medications.

Patients who have had a heart attack are currently treated with two blood thinning medications; aspirin over the long-term in combination with a second medication for a shorter 12-month period.

But no-one knows the optimal time period a patient should receive the second medication for.

This research involves two studies*, the Heart Foundation-funded study will involve more than 2,000 New Zealand patients who have had a heart attack and were treated in the standard manner. Blood samples collected from these patients will be used to find out which blood tests can then predict the patients who have bleeding complications from their treatment.

This work will provide vital information to guide the second, larger international trial, soon to start in New Zealand, where more than 6,000 patients who have had a heart attack will be given the second blood thinning medication for either three or 12 months.

Every year within New Zealand, 10,000 patients are admitted to hospital with a heart attack and one in five of these will die during the following year.

Dr Philip Adamson

Dr Adamson hopes the study will lead to better understanding why recurrent heart attacks occur and how these can best be prevented.

The Heart Foundation is essential to the research work I do. Here in New Zealand we have excellent health researchers and patients who are willing to participate in clinical studies. However, as a small country without a large biomedical industry we are heavily reliant on charitable organisations such as the Heart Foundation to support our work," Dr Adamson said.

**the second study is called DUAL-ACS, funded by the Health Research Council, ($1,550,000) – we will report on this study in a future edition of Heart 2 Heart.*

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Find us on Facebook

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 and return the slip below to us, including your address details, or direct credit our bank account **02-0800-0877177-00** – with your name as a reference, please email Lorraine Skelton indicating you have direct debited the account.

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