

Heart 2 Heart

Newsletter of the Christchurch Heart Institute



CHRISTCHURCH
HEART INSTITUTE
Rangahau Manawa o Ōtautahi



www.otago.ac.nz/chcheart



Welcome to the first issue of HEART 2 HEART. We believe that it's important to share our news, research developments and achievements – both personal and professional and we're sure you'll enjoy reading about them.

Thank you for your continued support. Without your contribution we would be unable to continue our work into the development of cutting edge advances in diagnosis, prediction and effective treatment of heart disease.

We also look forward to your feedback on what you would like to see included in these newsletters along with any stories you would like to share.

Congratulations to a number of our staff who were awarded funding for a number of projects in the 2013 Heart Foundation research grant rounds. You can read more about these in this newsletter.

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Professor Mark Richards
Director
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New Heart Treatment Trialled

Christchurch patients with a common form of heart disease are being offered the chance of a simple but potentially life-changing new treatment.

Christchurch Heart Institute Professor Mark Richards and his team are studying the success of a new procedure which 'zaps' overactive nerves causing problems in the heart.

The procedure – called renal denervation – has been used to treat excessively high blood pressure. Professor Richards believes using the procedure in patients with a common kind of heart failure will prove successful.

"In patients with smaller, stiffer hearts that don't relax properly, we don't really have anything that improves survival. I think there is a high chance this (the renal denervation technique) will be effective," Professor Richards says.

He and collaborators in Auckland, Wellington, Melbourne and Singapore will study the outcomes of more than 140 heart failure patients given renal denervation.



Professor Mark Richards

Heart Foundation Fellow Wins Top Cardiac Society Award

Former Heart Foundation Fellow Dr Maitliri Siriwardena from Christchurch was awarded the New Zealand Cardiac Society's Young Investigator Award at the annual meeting of the Cardiac Society in Wellington last year.

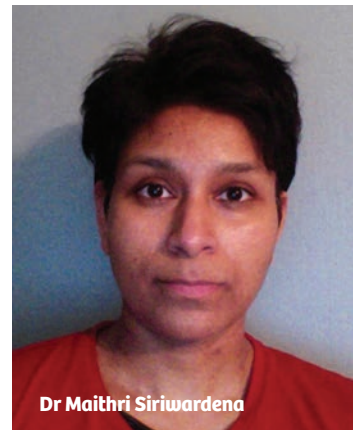
Dr Siriwardena won the prestigious award for her PhD project which studied a new protein that appears in the blood very early during a heart attack, called BNP signal peptide. This protein was first discovered in blood six years ago by Associate Professor Chris Pemberton.

A recipient of a Heart Foundation Research Fellowship in 2010, Dr Siriwardena completed her PhD with the University of Otago's Christchurch Cardioendocrine Research Group (now the Christchurch Heart Institute) under the supervision of Professor Mark Richards and Associate Professor Chris Pemberton.

"The protein has the potential to improve the care of patients with heart disease by being a potential early 'biomarker' (blood test) for the assessment of those most at risk of having an immediate heart attack," says Dr Siriwardena.

"This new research has shown that this is one of the many ways the person's own body may help to stop injury during a heart attack."

Dr Siriwardena is currently furthering her interest in cardiac imaging at the Peter Munk Cardiac Centre at Toronto General Hospital in Canada.



'Good Gas' For The Heart

Dr Leigh Ellmers is studying the possible cardio-protective role of hydrogen sulphide which has recently been recognised as having an important "signalling" role in the heart and vascular system. A series of studies is planned to investigate how the heart reshapes itself after an acute myocardial infarction when hydrogen sulphide is absent in the circulation and then when it is reintroduced. These studies will allow insight into the mechanisms of repair and protection following a heart attack which could be of clinical relevance.



Kidney Injury in Heart Failure

Kidney failure is a common accompaniment of heart failure and often a key determinant of clinical outcome with treatment. Heart failure treatment can often compromise kidney function and interventions to protect kidney function in heart failure are lacking. Building on a series of previous studies in experimental models, Associate Professor Miriam Rademaker and colleagues plan to investigate the underlying mechanisms of kidney injury during the development of and recovery from acute heart failure. They will also investigate whether the novel peptide urocortin 2 is a potential effective treatment for kidney injury in this setting. These highly original studies could have important implications for the improvement of heart failure management in the future.



The Hauora Manawa Project

This project led by Professor Vicky Cameron and Dr Suzanne Pitama, and previously funded by the Heart Foundation, has been comparing risk factors in rural Māori in the Wairoa district with urban Māori and non-Māori population samples. Baseline data indicated that rural Māori had higher risk factor levels than urban counterparts. A further study will enable a 5 year follow-up to better determine the relationship between risk factor levels and outcomes and to inform effective preventive intervention in this high risk disadvantaged population.



New Hormones for Heart Protection

Professor Chris Charles and Associate Professor Chris Pemberton will study the potential cardio-protective effects of novel circulating fragments of heart hormones (natriuretic peptides) they have recently discovered in the blood of patients suffering heart attack. Having characterised the structure of these novel peptides and their utility as biomarkers in acute coronary syndromes, they now aim to determine if they can provide protection for the heart at the time of intervention to reopen occluded coronary arteries. This approach has the potential to improve survival following intervention for coronary occlusion and may lead to a new therapeutic approach.



Christchurch Heart Institute Summer Studentship Programme

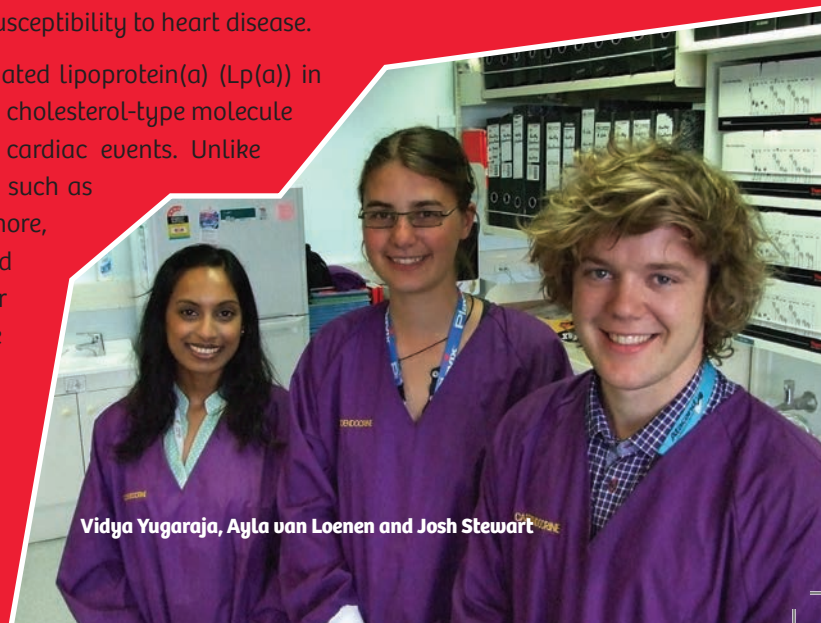
The Christchurch Heart Institute hosted Ayla Lore van Loenen, Josh Stewart and Vidya Yugaraja, as part of the University of Otago, Christchurch Summer Studentship programme over a 10-week period. This gave the aspiring young researchers the opportunity to work on real projects alongside some of New Zealand's leading research scientists.

The three projects presented to each student included looking for gene markers for Lipoprotein (a) levels in Maori, Pacific Island and European adults residing within New Zealand; searching for Circular RNAs in human plasma; looking at gene pathways associated with inherited risk of coronary heart disease.

Ayla was tasked with searching for Circular RNAs in human plasma. Circular RNAs are a new class of RNA molecules recently identified within humans, which are thought to be protected from degradation in the body, which could indicate them as possible biomarkers for disease. Ayla's project was a pilot study to determine whether Circular RNAs were present in human plasma and therefore a possible candidate as a biomarker for coronary heart disease. The results Ayla found were promising and suggest for the first time that these forms of RNA may be present in human plasma, which has the potential for further research to identify the suitability of these circular RNA's as a potential biomarker for coronary heart disease.

Josh looked at the gene pathways associated with inherited risk of coronary heart disease. Although developing coronary heart disease can result from unhealthy lifestyle choices, there is also a strong genetic link to the disease. One common genetic variant associated with inherited risk is on chromosome 9 (Chr9p21), and people with two copies of this have a 60% greater risk of developing coronary heart disease than those with two copies of the low-risk variant. To understand why the high-risk variant increases susceptibility to heart disease, Josh investigated levels of two marker proteins, VCAM-1 and Periostin. The findings suggest that people with the high-risk variant (Chr9p21) have lower levels of VCAM-1 protein in heart tissue, but higher levels of VCAM-1 protein in the circulation, compared to people with the low-risk variant. These results suggest that higher circulating levels of VCAM-1 protein, but not Periostin could be a marker for genetic susceptibility to heart disease.

Vidya, a 4th year University of Otago medical student, investigated lipoprotein(a) (Lp(a)) in Maori, Pacifica and NZ European heart disease patients. Lp(a) is a cholesterol-type molecule and extremely high levels have been associated with future cardiac events. Unlike cholesterol, Lp(a) levels are not affected by lifestyle behaviours such as diet, smoking or cholesterol-lowering medications. Furthermore, Lp(a) levels are regulated by the LPA gene. The results revealed that Maori/Pacific heart disease patients had significantly lower Lp(a) levels than NZ Europeans patients, which contradicts the suggested relationship between Lp(a) and heart disease. Further comparisons within the LPA gene showed no genetic sequence differences that could account for the difference in these levels.



Did you know?



16 New Zealanders **die** from heart disease **every day**

New Zealand has one of the **highest** rates of **survival** from **Heart Disease** in the world

How you can help save lives!

Many Cantabrians have already helped us in our work by taking part in our community and hospital research projects.

There are many ways you can help us cut the number of deaths from heart disease by donating to the Christchurch Heart Institute, from a straightforward donation, bequest or regular payroll giving.

Your donation can be used to support specific research projects, to purchase critical pieces of equipment or to fund fellowships for young researchers early in their career.

For more information on how you can help save lives, please contact our **Administration & Communications Manager** on **03 364 1253** or visit **www.otago.ac.nz/chchheart**.

If you would like to receive this publication electronically, please email: **angie.forrest@otago.ac.nz**

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Heart Foundation Grants to CHI Researchers

Since 1968 the Heart Foundation has invested more than \$50 million in New Zealand-based research; this funding includes support for 180 fellowships and scholarships since 1970.

In its 2013 research grants round, the Heart Foundation awarded funding to a number of Christchurch Heart Institute projects.



Fulfil
a lifetime



The Christchurch Heart Institute acknowledges the support of the Heart Foundation and Health Research Council of New Zealand.