



CHRISTCHURCH
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University of Otago, Christchurch Newsletter

Dean's welcome

As we look to the end of 2014, many of our students are planning for life outside of University. Our 6th year medical students will soon finish their studies and become qualified health professionals after their graduation in Dunedin.

Our postgraduate students receive recognition for their studies in certificate and diploma level courses, as well as PhDs, Masters and Bachelor of Biomedical Sciences (Hons) degrees. We currently have about 550 postgraduate health science students in disciplines such as nursing and public health, and more than 100 students undertaking postgraduate research degrees.

While we are part of the University of Otago, at the Christchurch campus we have developed our own special traditions. At the beginning of each year we hold an inauguration ceremony where we welcome new 4th year medical students. Prizes are also awarded to exceptional students and lecturers for their achievements the previous year. Dr Sean Macpherson is one of those teachers students love to

learn from. A story about a unique teaching programme he developed with our public health team is featured below.

Some of our research groups, particularly those studying heart disease and medical technology, have won praise, and funding, recently. This newsletter contains details of significant grants from the Health Research Council (HRC) and the Ministry of Business, Innovation and Enterprise (MBIE).

Our bioengineering research groups are among those awarded multimillion-dollar grants. Christchurch is fast becoming a hub for innovative, and potentially lucrative, medical technologies. This was recognised in a recent meeting in the city of Government and private sector groups, including the Canterbury District Health Board (CDHB), private med-tech companies and universities.

Enjoy the warmer weather, and the news contained in this newsletter.

Regards

Peter Joyce

Medical students educate on sexual health

Fifth year medical students were this year challenged to get out of their comfort zone by devising innovative ways to communicate sexual health messages.

The results: songs, a couple of raps, educational videos, teaching sessions and an entire musical about HPV (human papillomavirus). Many of the groups of students performed their creations to the public, including to audiences of prison inmates, pub goers and road workers.

The idea was dreamed up by singing medical school lecturer and health board haematologist Sean Macpherson, who sings original compositions as part of his teaching sessions.

Those involved in devising the medical students' public health course, including course convenor Jen Woollett, quickly got on board.

Dr Macpherson says he "basically had a silly idea which would have gone nowhere without the vision, skill and hard work of colleagues."

"The emphasis was on the process of public health in action – how to disseminate an important health message to the target

population. Teamwork was also one of the most important aspects of the course," he says.

"The students deserve a huge amount of credit for embracing an idea that often seemed like abject silliness. It has been really exciting to see them in creative mode, working so well together and with the general public. I have been impressed by how sensitively they dealt with the subject matter and how flexible they were in their approach."



Medical students and lecturers debrief after performing a song about sexual health to patrons at Christchurch's Smash Palace bar.

The Health University in Christchurch City

Cancer research

CANCER FUNDING MAKES HUGE DIFFERENCE

Four years ago, cancer research in Christchurch received a transforming boost in the form of financial support from the Mackenzie Charitable Foundation.

The funding established oncologist Professor Bridget Robinson as the Mackenzie Chair in Cancer Medicine, and gave momentum to important research projects.

Professor Robinson says “as the Mackenzie Chair, I have been able to promote cancer research and help health professionals learn about cancer and its treatment, while continuing to manage patients within the Oncology service.”

The Mackenzie Charitable Foundation’s generosity has also supported research:

- by medical oncologist Dr Tony Rahman into blood clots in those with cancer, aiming to predict which patients are most at risk of this often fatal complication

- on the impact of obesity on breast cancer risk and reaction to treatment. Though at an early stage, the research shows being obese seems to make it easier for cancer cells to grow, and make a common anti-cancer drug less effective
- studying the effect of genetic variations on breast cancer (by Dr Logan Walker whose work is featured on this page)
- investigating the effect of vitamin C on cancer cell growth.

The Mackenzie Charitable Foundation’s money also helps maintain a tissue bank, which holds samples of cancerous and non-cancerous tissue for use in a wide range of medical research projects.

Professor Robinson says “our research is flourishing with support from the Mackenzie Charitable Foundation. All of our projects are translational research, which means research sparked by problems identified in patients, which is then applied back in the clinic. Our success translates into better care for Canterbury patients.”



Members of the Mackenzie Cancer Research Group

THE BREAST CANCER GENETIC PUZZLE

For the public, getting information about their entire genome is now increasingly easy and affordable. But test results often show genetic changes which doctors and scientists do not yet understand. One example of this is genetic variations for breast cancer.

Genetic testing of BRCA1 and BRCA2 genes has become common practice for patients with a strong family history of either breast or ovarian cancer. While some results can clearly identify those with harmful mutations, a significant proportion of tests show a genetic change for which disease association is uncertain.

“For the public, getting information about their entire genome is now increasingly easy and affordable”

Dr Logan Walker is a principal investigator in the Mackenzie Cancer Research Group, based at the University of Otago, Christchurch. He is also the sole New Zealander in the global collaboration ENIGMA (Evidence-based Network for the Interpretation of Germline Mutant Alleles), which leads the world in determining what genetic changes increase the risk of breast cancer.

His contribution to the collaboration involves interviewing members of New Zealand families with breast cancer, and collecting their DNA for analysis. The ultimate goal is to prevent or reduce the impact of cancer in New Zealand families.



Logan Walker

Bioengineering and regenerative medicine

NEXT GENERATION JOINT REPLACEMENTS BEING DEVELOPED

A Christchurch-led team is developing the next generation of 3D-printed joint replacements, where patients' bones can grow through and around the implants for a stronger, longer-lasting solution.

The team, led by Dr Tim Woodfield of the University of Otago, Christchurch, has just been awarded more than \$3.2million in funding from the Government's Ministry of Business, Innovation and Enterprise (MBIE).

Auckland University and New Zealand companies Enztech and Ossis are part of the cutting-edge team. Enztec and Ossis have already been producing custom-designed titanium implants for patients with complex needs for more than six years. This includes replacements of large and unusually-shaped areas of bone lost due to accidents or cancer.

Dr Woodfield says the aim of the project is to develop a better system for 3D printing titanium implants. This includes perfecting surfaces and shapes which maximise the growth of bone in and around the implant. Promotion of bone growth between the implant and human bone is vital to create a strong bond, and enable the natural transfer of load. This maintains the bone in a healthy condition, eliminating many of the current orthopaedic complications and failures.



GOVERNMENT BACKS WORLD-FIRST 3D SCANNER

The MARS CT Scanner represents the new era in radiology. It was invented by a collaboration of University of Otago, Christchurch and Canterbury University scientists. The machine is revolutionary because it provides information about bone, soft tissue, calcifications, injected agents and artificial joints not available through existing technology. It will ultimately mean doctors can better detect, diagnose and treat major disease such as cancer and heart disease.

The scanner has already been sold to medical researchers internationally in a small animal-sized form.

The developers, led by Associate Professor Anthony Butler, have just received more than \$12 million from the Ministry of Business,



Anthony Butler

Innovation and Enterprise (MBIE) to develop the machine into a model which can accommodate a human. The machine could potentially also be used to measure other complex structures such as meat and in border security, without destructive intervention.

Anthony Butler is an Associate Professor at both the University of Otago, Christchurch, and with Canterbury University.

He says the machine could be a 'revolution in medical imaging'.

"The economic potential to New Zealand is substantial"

"This will provide us with links with dozens of international universities, many of whom now visit New Zealand to test their pharmaceuticals on our pre-clinical scanners. We will also forge business links with international companies including healthcare organisations and many local industries including high precision mechanical companies and electronic manufacturers. The economic potential to New Zealand is substantial," Associate Professor Butler says.

Veteran staff member retiring

For more than three decades, Professor Elisabeth Wells has provided the statistical analyses behind many of the University of Otago, Christchurch's (UOC's) key studies on mental and public health as well as clinical research.

Professor Wells is a biostatistician, which involves devising the way data is collected for a study, and analysing the results. While she is often in the background when a study is published, her role in establishing the figures is crucial.

Professor Wells is now close to retiring. She says her initial work in Christchurch was on a short-term grant for the Alcohol Advisory Council (ALAC) so when a more secure position came up at the University, she applied.

"I have always been interested in methods for answering scientific questions, both in terms of design of studies and analysis.

Working as a biostatistician requires understanding and learning about design and analyses, so has suited me well."

Professor Wells says the work at the UOC has always been varied, including projects on mental health and substance abuse. She also gets to work with a lot of different researchers, which she says she enjoys. In her 30 years of work, the technology for analysis has changed radically, providing much to learn and more job satisfaction.

Outside work hours, Professor Wells enjoys reading, gardening and "playing the piano badly."





Health research funding for heart failure project

Heart Failure will affect one in five people now aged 40 years. It is often associated with high rates of early hospital readmission and death. A team of scientists and clinicians led by cardiologist and Christchurch Heart Institute Professor Mark

Richards have won almost \$5 million in Health Research Council funding to investigate new tests and ways of managing the condition. It is hoped the research will provide cardiologists with a new suite of treatment options.

Professor Richards says the integrated research programme will address a number of unmet clinical needs, including:

- a more intensive form of post-discharge management, using special blood tests to monitor and rapidly adjust treatment
- investigating promising blood 'markers' or tests which could earlier detect kidney damage, a common and dangerous complication of heart failure
- trialling newly discovered tests for early warning of pneumonia, which often complicates heart failure
- clarification of diagnoses and testing management plans for patients in the Emergency Department with breathlessness or chest pain who do not have clear-cut heart failure or heart attacks but who nevertheless have elevated blood biomarkers and a poor outlook.

Professor Richards says by the end of the funding term in 2019, the group will have had 27 years of continuous funding from the Health Research Council.

"This is an almost unheard of track record for biomedical research groups such as ours and utterly remarkable given the intense competition for scarce health research funds in New Zealand."



Mark Richards

Cantabrians lead the way in infectious disease research

Infectious diseases such as influenza and those caused by antibiotic-resistant bacteria increasingly threaten society's health.

Researchers from the University of Otago, Christchurch, are collaborating with Canterbury District Health Board colleagues to provide new insights into the prevention, management, surveillance and control of infections of global importance.

The Infection Group is led by two of the country's top infectious disease experts, Professors David Murdoch and Steve Chambers. Both work for the University of Otago, Christchurch (UOC), as well as the Canterbury District Health Board (CDHB). Professor Murdoch is a clinical microbiologist and head of the UOC's Pathology Department. Professor Chambers is the medical director of the CDHB's infectious disease department, and a UOC researcher. Other members involve laboratory staff, epidemiologists, a paediatrician, a pharmacist, and a respiratory physician.

Professor Murdoch says the team has been working together for some time but decided recently to 'brand ourselves'.

"I think we can honestly say that we are New Zealand's most pre-eminent research group on human infectious diseases," he says.

"One of our strengths is that our research has always had a clinical focus, much of it embedded within the clinical services of the CDHB and working with CDHB staff. We have intentionally blurred the margins between the two institutions, and Steve (Professor Chambers) and I both hold senior CDHB roles. This is a true alliance between the University and the health board."

The group's main research interests are pneumonia, legionnaires' disease, vitamin D in infections, antibiotic resistance, breath analysis for infections and improved diagnostic tests for infections.

The group is involved in projects based in five African and four Asian countries, as well as New Zealand.



David Murdoch



Steve Chambers

"This is a true alliance between the University and the Health Board"

Healthier Future Appeal

Be part of Christchurch's healthier future

See how to foster some of the best and brightest students and researchers.

otago.ac.nz/christchurch/about/appeal