Auckland NOW

MAKING AN IMPACT

ISSUE 10 July 2012

New facilities

We've revamped our Medical School to put it on par with the best in the world

Teenage depression

A helping computer game

Building safe

Earthquake-proofing our historic buildings

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makaurau

Being visible

Transparency, visibility and breaking down barriers between disciplines are the key to good research these days and The University of Auckland's $240 million redevelopment of its Grafton medical training facility is designed to make that happen.

Walls have literally and metaphorically come down to allow more cross-over between the schools of Medical Sciences, Medicine, Nursing and Pharmacy, and to encourage cross-disciplinary research. "We wanted to open things up and expose the research process so people could benefit from each other," says Steven Middleton from Jasmax Architects.

Traditional divisions between departments have been replaced with theme-based research while open-plan, multi-disciplinary teaching and research spaces have been created, radically transforming the way more than 4,000 students and 1,500 staff go about their work.

Step inside the Infection and Immunity research section on the second floor, for example, and you'll find some 56 immunologists, structural, molecular and micro-biologists all working side by side in seven open-plan laboratories, with only transparent floor-to-ceiling glass to separate them "This is about clustering and engagement and promulgating those corridor conversations," says Dean of the Faculty of Medical and Health Sciences, Professor John Fraser (pictured with Research Fellow Fiona Radcliff) whose research team is based in this section and is working on the common *Staphylococcus* infection.

Another project in the lab is part of the global effort to combat tuberculosis (TB) and is a good example of what can be achieved when barriers between disciplines are broken down: Molecular Biologists working with the Auckland Cancer Society Research Centre (ACSRC) are trialling a cancer drug to combat TB. What's more the work is possible because of the new Pathogen Containment laboratory which was built as part of the redevelopment so our researchers can study global agents that cause serious disease.

University cancer researchers have long championed cross-disciplinary work to deliver economic benefit to the country through drug discovery and innovation while at the new Centre for Brain Research, the philosophy is more recent. Yet already here it is revolutionising the treatment of neurological diseases like stroke, and lazy eye where the combined skills of a vision neuroscientist, pharmacist and psychiatrist may lead to a common anti-depressant drug being developed for the condition.

"This campus is designed to facilitate cross disciplinary research and innovation that will improve the health of New Zealanders and will help us retain and recruit academic clinicians and biomedical researchers from around the globe who expect facilities of a very high standard," says Professor Iain Martin, former Dean of the Faculty, who with Director Property Services, Peter Fehl, oversaw the four-year redevelopment.

The new design is also about efficiency: the laboratory layouts are flexible and can easily adapt to change while services common to researchers across disciplines such as stores, consumables, sterilization and bio imaging, have all been centralised. Undergraduate teaching is focused on lower floors and these open into an atrium topped by a roof made of fluorine-based plastic.

"It's great to know the next generation of young doctors, pharmacists, nurses and many other health professionals will be learning in state-of-the-art facilities," Prime Minister, the Right Hon. John Key told the University when he opened the building.

Auckland Now showcases the impact The University of Auckland has on Auckland, New Zealand and the international community through its teaching, research and community service. Contact us at: aucklandnow@auckland.ac.nz

Grape to glass

Will Kerner's interest in winemaking started in his family's vineyard in Marlborough and grew as he worked long hours as a cellar hand in Marlborough, California and Chile. He was learning the craft of winemaking on the job but turned to The University of Auckland to learn about the science.

Will is studying for his postgraduate Diploma in Wine Science and is based at the University's Goldie vineyard on Waiheke Island. "I decided last year that I wanted to really understand the science of what I was doing, rather than relying on notes from a busy winemaker," says Will, aged 30, whose first degree was in Philosophy.

He is now following the winemaking process through from the grape to the glass. Students learn practical viticulture in the vineyard, and analysis of sugar content, alcohol and acidity levels, tracking fermentation and preparing wine for bottling in the customised teaching laboratory. They also learn how to taste and evaluate wine and develop their sensory ability.

"Learning the biochemical pathways that explain the wine-making process at a molecular level has been fascinating," says Will. "Without doubt I'll make better wine after the course."

The New Zealand wine industry earns more than a billion dollars a year and has a reputation for producing high-quality wines, says Philip Gregan, Chief Executive of New Zealand Winegrowers. "The only way we can keep up that quality is if we have really well trained viticulturalists and winemakers who understand the winemaking process," he says.

"The University of Auckland's Wine Science programme is intrinsic to that, particularly with its focus on postgraduate study. This differs from most other institutions and produces well-trained people with inquiring minds," says Philip.

The Wine Science postgraduate programme began in 2003 as part of the School of Chemical Sciences and includes a strong research dimension. Working on projects with scientists at the Marlborough Wine Research Centre, students have been identifying aroma compounds in Sauvignon Blanc and Central Otago Pinot Noir; others have been developing different yeast strains for fermentation.

The idea of "hands-on" science appealed to Ophir Karon, who became interested in winemaking during her first year of a Bachelor of Science, majoring in Biology at the University. "I love the social aspect of winemaking and which is a good amalgam between Art and Science."

Ophir is now living on site at the Goldie vineyard for the final year of her studies and when she finishes the course she plans to work in Australia's Hunter Valley for the harvest and then return to Hawke's Bay for the autumn picking.

More than 100 students have completed the practical winemaking diploma and now work at wineries including Villa Maria, Stony Ridge, Delegats and Pernod Ricard.

"The course gives students a total immersion in the science and practise ofwinemaking," says director Randy Weaver. "As a result we're contributing people with a passion and technical expertise who can continue to increase the quality of New Zealand wine."

www.winescience.auckland.ac.nz

Pictured: Ophir Karon and Wll Kerner

Bright spark

Ella, aged 14, was "in a bit of a low place" when she sought help from her school counsellor. "I'd been through a lot of things. I didn't know what to do with myself and I thought it was going to get much worse," she says.

Ella was not alone – up to 25 per cent of New Zealand teenagers suffer from depression significant enough to need treatment. However she was one of the first to try SPARX, an interactive computer fantasy game developed by The University of Auckland's Department of Psychological Medicine.

SPARX uses high-end graphics, avatars and a fantasy journey to help teenagers combat depression by teaching behaviours such as problem solving, being active, positive thinking and relaxation.

The game is based on Cognitive Behaviour Therapy (CBT), one of the main methods for treating depression, but it is difficult to access CBT in New Zealand, says Associate Professor Sally Merry, who directs research at the Werry Centre for Child and Adolescent Mental Health.

"There aren't enough therapists, it's expensive if you pay privately, and young people are often reluctant to seek help."

Her team's answer was SPARX, a combination of instruction from an interactive guide and a series of challenges to restore the balance in a fantasy world dominated by GNATS (Gloomy Negative Automatic Thoughts). "The computer game allows young people to see their characters taking on challenges that parallel what's happening in their own lives," says Sally.

"It involves a lot of allegory and metaphor, such as lighting a lantern to stay warm in a frozen tunnel of inactivity, tackling a mountain of a problem or escaping the swamp of unhelpful thoughts."

Ella learnt skills including deep breathing, problem-solving and negotiation as her avatar travelled through a dark land on the back of a giant eagle, gaining strength through each quest as she negotiated with the "fire spirits" of intense emotion. And she came to rely on a tui called Hope to lift her spirits in the darkest places: "Every time I followed her, good things came my way, so it was really motivating."

Project manager Dr Karolina Stasiak was guided by teenagers who said they did not want to get help from a book. "They wanted something they could play with, that was fun and appealing."

Ella was part of a nationwide study that showed SPARX was as effective for treating mild to moderate depression as traditional face-to-face therapy. After the results were published in the *British Medical Journal*, *SPARX* received global recognition and coverage in the *Daily Telegraph* in London, on CNN and the BBC.

"We've been overwhelmed and quite humbled by emails from all over the world," says Karolina. These include a health provider wanting to trial SPARX with Inuit people, and another from a researcher in Egypt who would like to translate it into Arabic.

The success of SPARX does not surprise Ella, who is now an articulate 16-year-old, working hard, enjoying life and hoping to become an actor. She believes SPARX can help give young people control over their lives.

"There are a whole lot of techniques you can use to cope with the things that happen and the way you feel. I'm still going through emotional patches but I've learned how to handle them better."

www.sparx.org.nz

Safe building

University of Auckland earthquake engineer Jason Ingham was the right man on the spot when the devastating Christchurch earthquake struck on February 22, 2011.

Associate Professor Ingham was in the CBD to present a comprehensive manual to local earthquake engineers on how to retrofit older buildings to meet seismic requirements. It was Jason's first experience of a big quake: "Thankfully we were in a comparatively modern building."

Jason and his team stayed on in the city to help and began gathering data on Christchurch's heritage and unreinforced masonry (URM) buildings. He returned to the city nine months later to present his findings to the Canterbury Earthquakes Royal Commission and is now developing nationwide guidelines on how to strengthen unreinforced brick and masonry buildings.

These guidelines may decide the fate of nearly 4,000 of the country's historic buildings, the earthquake-prone structures built before the 1940s that lend character and identity to our city centres such as the historic precinct in Wanganui, historic buildings in Dunedin and Wellington and in the suburbs of Auckland such as Ponsonby Road, Mt Eden and Devonport.

"We've known since the 1931 Napier earthquake that URM buildings don't perform well in large earthquakes," says Jason. "They rely mostly on gravity to keep them together. They generally have no physical connection between floors and walls and the mortar is not very strong.

The main principle with retrofitting is to tie walls, floors and roofs together with mechanical fixings such as steel rods and anchor plates so the URM building behaves more like a rigid box.

Brick structures are made more resilient by tensioning steel rods that are inserted vertically in walls or attached to the outside and then tightened. Mortar can also be strengthened and coatings such as fibre-reinforced polymers applied to hold internal walls together.

"Many of our communities are much more focused on what to do about their historic buildings now," says Jason. "We have to make decisions about whether to demolish dangerous buildings and lose our heritage, or spend a very large amount of money to strengthen a building, or just pick and choose what we'll save."

His team has scoured records to find out what strengthening work had been done before the Christchurch quake, what the predicted strength of that work was and how that correlated to performance. "We need a much more robust understanding of what happened so we can translate it to the rest of New Zealand to increase the safety of historic buildings."

Jason was introduced to earthquake research while doing a PhD in Civil Engineering at the University of California, San Diego, soon after the 1989 San Francisco earthquake. His project looked at redesigning and retrofitting joints on severely damaged concrete freeway bridges in the Bay area.

He joined the staff at The University of Auckland in 1995 and specialised in the engineering of concrete masonry buildings. When the 2004 Building Act came in he worked with Canterbury University engineers to develop seismic retrofit solutions for buildings to meet new earthquake requirements. The subsequent manual, completed in late 2010, took him to the city on that fateful February day.

Now one thing's for sure, thanks to work led by Jason we'll soon have comprehensive guidelines on how we can make our historic buildings safe.

Doing business

Sitting in a student cafeteria devouring *Pride and Prejudice* and books on the Second World War may seem unlikely training for becoming a CEO, but it helped Phil O'Reilly take the top job at BusinessNZ, the country's largest business advocacy group.

Phil spent hours reading in the cafeteria or library when he was an undergraduate doing a double major in English and History at The University of Auckland in the 1980s.

"I would read 1000 pages a week. I had an extraordinary amount of stuff to get through. The capacity to read fast and insightfully and then make an argument about what you've read is a valuable skill for any CEO or senior executive."

Phil completed his masters with a thesis on the origins of the New Zealand ACC scheme and then worked as an industrial advocate with the Auckland Employers Association. In 1990 he became Executive Director for the Newspaper Publishers Association and in 2000 was appointed Head of Employment Policy and Communication at Westpac in Sydney. He returned in 2003 to head BusinessNZ, which represents thousands of companies of all sizes.

Phil aims to "provide leadership and lead conversations" as New Zealand faces two important and interconnected issues: the need to be more productive and to be more internationally competitive. He says one of the keys to achieving this is to develop wealth based on how we think.

"Increasingly if we're going to compete in the world it's going to be with intellectual property. New Zealand has interesting features like water and our clean green image but these are not competitive advantages in themselves – rather it's the way we use water and take it to market. That's where universities come in because they are our largest engine room of intellectual property."

Phil supports the Government's push to get more Science, Technology, Engineering and Maths (STEM) skills fostered in schools and he has been instrumental in creating a national Advanced Technology Institute to help business and researchers collaborate.

He is also working with an advisory group on child poverty. "A lot of my role involves trying to work out the interactions of government policies with business and the world, and trying to give policy-makers insights about that."

But ever mindful of his humanities background he cautions: "Business needs to be successful in the context of a successful society. Business is not the end, it's a means to the end."

www.businessnz.org.nz

Auckland Now: Produced by The University of Auckland **Editor:** Tess Redgrave
Art Direction/Design: The University of Auckland **Photography:** Dean Carruthers.