



Tāmaki Update

December 2012
A newsletter for
Tāmaki Innovation
Campus

Landcare’s plant pathogen facility a NZ first



Dr Jessica Beever opens the Landcare pathogen containment facility with her son, Graham Beever, beside her.

Landcare Research’s new plant pathogen containment facility is the first of its kind in New Zealand. It will allow scientists to improve research capabilities and turnaround times, while guarding the country’s environmental security.

The \$2.4 million building has been named in honour of the contribution made by the late Dr Ross Beever to plant pathology and the conservation of New Zealand’s flora, and the on-going contribution of his wife, Dr Jessica Beever, in documenting and

conserving New Zealand’s bryophytes.

Colloquially termed a ‘maximum security prison for bugs’ the recently opened facility will serve as containment for pathogens prior to their permitted release. The first residents are two rust pathogens for the pervasive lantana plant (*Lantana camara*), but it will also be suitable for insect containment.

The Tāmaki facility will house plant pathogens that are being developed as weed biological control agents. With the

advent of the new facility, it will be possible to undertake this research more quickly than previously possible and with better controls. Up until now, this research has been carried out via collaboration with overseas laboratories, and time delays have frustrated researchers and end users alike.

Localising it to New Zealand will bring better control over both the time and quality of research. “It’s important we are able to be totally confident that the pathogens are completely clean and host specific before they are released to the environment,” says Sarah Dodd, Plant Pathologist-Scientist in the Biodiversity and Conservation team.

Security is paramount, and rubbish and waste water is treated to kill any insects or pathogens it might contain. All those who enter the facility have to change clothes to leave the facility, and in some instances are required to shower first. The entire facility is under negative air pressure with all air flow leading to the corridor inside to ensure nothing escapes when doors are opened, and there is also an airlock entrance/exit.

There is interest from the Ministry for Primary Industry in doing work on diseases not found currently in New Zealand. The outcomes would provide insight in how to manage and prepare for these, particularly in an emergency.

The new facility supplements Landcare Research’s Lincoln-based invertebrate containment facility which has special climate controlled rooms where insects can be reared and studied.



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Message from Pro Vice-Chancellor Tāmaki Innovation Campus

continuing with business as usual for the near future with the major focus being to foster strong innovative research.

I am delighted, therefore, that a new area of research is to be established early in 2013 with the inauguration of a new laboratory for Food Process Engineering. The building work for this is currently underway in Building 734 and Professor Murat Balaban, of the Department of Chemical and Materials Engineering, together with a number of his colleagues and their research students will be moving to the campus in order to be based adjacent to their major research facility. In keeping with the innovation theme of the campus the establishment of this laboratory will permit greater translation of findings from basic science to practical applications that enhance society. This is being made possible through a partnership with Plant and Food Research who are funding a Senior Lectureship in Food Process Engineering (Dr Zaid Salah) and endowing the new laboratory with a Food Process Engineering pilot plant.

In this issue of the Tāmaki Update, you will see our long established CRI partner, Landcare Research, has recently opened a pathogen containment facility. As the only facility of its kind in NZ, this is a significant development for our environmental security, and supports Landcare's facilities in other parts of the country.

Congratulations are in order for Professor Reinhard Klette who has recently been made a Fellow of the Royal Society of New Zealand. This is an important honour for his exceptional contribution to research and the advancement of technology in his field of computer science.

I would also like to congratulate Dr James Russell who has been awarded the 2012 Prime Minister's MacDiarmid Emerging

Scientist Prize for his internationally-recognised conservation work. This is truly an impressive achievement, as the Prime Minister's Science Prizes are New Zealand's most valuable science awards and were introduced to raise the profile and prestige of science.

It has been a great privilege as well as a pleasure to be able to work with the academic and professional staff at the Tāmaki Innovation Campus over the last three years. It has also been a marvellous educational experience for me as I have been able to learn more about the exciting (and innovative!) teaching and world leading research that is conducted at the campus.

I would like to use this opportunity to thank all staff and students at the campus for their many and various contributions. In particular, I should like to recognise Hayley Schnell who, as Tāmaki Innovation Campus Manager, has provided me with invaluable help, advice and local knowledge that has enabled me to fulfil my duties as Pro Vice-Chancellor. I have appreciated very much Hayley's tireless work for the Tāmaki Innovation Campus. This has ranged from working on high level strategy to addressing the more operational issues of dealing with late running buses and complaints about catering. Hayley invariably addresses the tasks and issues she faces in a highly efficient and customer centred way; with the most junior student or member of professional staff being accorded the same courtesy and attention as the most senior members of the University or distinguished visitors to the campus.

With my best wishes

Professor Michael C.R. Davies
Pro Vice-Chancellor
Tāmaki Innovation Campus

This will be the final message that I will be writing for Tāmaki Update as Pro Vice-Chancellor Tāmaki Innovation Campus because, as many of you will know, I will be leaving The University of Auckland at the end of December to take up a new post at the University of Sussex in the UK. I was delighted – but also a little daunted – when in 2009 the Vice-Chancellor invited me to become Head of the Campus. The intervening time has seen a great deal of change at the campus. Not least the change of name to the Tāmaki Innovation Campus!

The first eighteen months of this was spent getting to know better the activities taking place at Tāmaki and developing an integrated strategic and precinct plan. This led to the establishment of the initial two academic themes - Health Innovation and Materials Innovation - and the development of the physical infrastructure to support this. This development process has continued with new academic and innovation activities moving to the campus and the establishment of a third campus theme, Biodiversity and Biosecurity Innovation.

Despite the medium term future of the campus being uncertain, as I wrote in the last issue of Tāmaki Update, the implementation of a University estates plan that could result in an exit from the campus is still some years away. Therefore, activities at Tāmaki will be



Computer Science outperforms major computer vision centres globally



Simon Hermann (right) with his supervisor Professor Reinhard Klette.

Computer Science at Tamaki is receiving top rankings for its optical flow and stereo analysis algorithms on the KITTI Vision Benchmark Suite, a Karlsruhe Institute of Technology (Germany) and Toyota Technological Institute (Chicago) project.

Design and implementation of The University of Auckland’s successful programs was undertaken by PhD student, Simon Hermann, supervised by Professor Reinhard Klette. Both recently presented their solutions at the Asian Conference on Computer Vision, one of the top computer vision conferences worldwide.

“It is really a major achievement for Tamaki Innovation Campus to achieve a second ranking in both categories,” says Professor Klette. “Competing groups are from Toyota Technological Institute, German Air and Space Institute, Daimler Research, Honda Research, Graz University, and ETH Zürich. Major players in the field of stereo vision compete for the best performing stereo vision and optical flow algorithms using challenging real-world data, and are typically supported by well-funded research programmes. So, for Tamaki and Computer Science, it’s a real validation of the quality and efficiency of our research.”

Stereo vision is a fundamental component of today’s computer vision solutions, applied in advanced applications for robotics and industrial automation. It is used to generate 3D models of buildings or city maps, and is applied in vision-based driver assistance, Professor Klette’s particular research passion.

Professor Klette honoured

Professor Reinhard Klette has been elected a Fellow of the Royal Society of New Zealand.

“Being elected as a Fellow is an honour given to our top researchers for showing exceptional distinction in research or in the advancement of science, technology or the humanities,” said Professor Richard Le Heron, chair of the Society’s Academy.

“Professor Klette’s research into computer vision is world class, and as a consequence he attracts many graduate students to our Department,” says Head of Department of Computer Science Professor Gill Dobbie.

Professor Klette was honoured by the Royal Society as a world leader in computer vision who, with his students, has improved the performance of computer vision algorithms since the 1990s.

Rat research a PM prize-winner



Dr James Russell uses a combination of ecology, statistics and genetics to prevent rat invasion.

Dr James Russell from the School of Biological Sciences and the Department of Statistics, who is internationally recognised for his research on conservation, has been presented with the 2012 Prime Minister’s MacDiarmid Emerging Scientist Prize.

His Prime Minister’s prize, worth \$200,000, rewards him for his unique DNA fingerprinting of rats, sophisticated statistical modelling and application of scientific tools to solve conservation problems.

Rats have invaded more than 80 per cent of the world’s island groups and are blamed – along with other mammalian predators – for killing 26 million native birds in New Zealand forests every year. James says rats are difficult to catch because they are intelligent creatures that learn to avoid poison and traps.

While working on his PhD, he discovered the extent that rats could swim or hitchhike to pest-free islands. Using genetic tracing, he determined if they were eradication survivors or new invaders, and then tracked their movements on pest-free islands. This resulted in greater understanding of invasions and new island conservation pest management techniques.

“Removing pests from islands is the single most cost effective way to solve a conservation problem. I am now working to extend this approach to onshore sanctuaries and larger, predator-free areas across New Zealand,” says James.



Tamaki's expertise helps tinnitus sufferers



Giriraj (Raj) Singh Shekhawat's interest in tinnitus evolved while working as a clinical audiologist at Tan Tock Seng Hospital in Singapore.

Audiology PhD student Giriraj (Raj) Singh Shekhawat has a passport full of stamps that reflect his academic travels, and Singapore to acknowledge for his 'aha!' moment that ultimately led him to Tamaki Innovation Campus and a HealthEx award.

Indian born Giriraj is no stranger to travel, both as a child with his Indian Army father, and more latterly to further his academic studies. His academic sights were set high at the start, with a double masters in audiology and speech language pathology from Ali Yavar Jung National Institute for the Hearing Handicapped (Mumbai), where he topped the university with the highest ever marks since the course started.

He worked in Mumbai as an Audiologist for 18

months before moving to Houston, Texas as a speech language pathologist. Giriraj says, "I enjoyed my job but realised that I am more of an audiology person instead of a speech pathology person."

An offer from Tan Tock Seng Hospital in Singapore drew him to a position as clinical audiologist there for two years, where his interest in tinnitus evolved, shaping his future career.

Tamaki's Dr Grant Searchfield was responsible for encouraging Giriraj to New Zealand to follow his passion for tinnitus research and is the main supervisor for his research on transcranial direct current stimulation (tDCS) intensity and duration effects on tinnitus suppression.

Giriraj was recently recognised with first

place in Applied and Clinical Science at the HealthEx awards, a Faculty of Medical and Health Sciences initiative promoting research activity and presentation amongst undergraduate and postgraduate students.

"Around 15-20% of the population suffer from tinnitus in its varying forms, and around 1% need intervention to live with the disorder. There is no silver bullet and no cure, but there are ways to manage it and various intervention options ranging from external sounds to training the brain that can help sufferers," he explains.

His research investigates the optimum combination of brain stimulation through tDCS and digital hearing aids. A pilot study explored settings for a mild current to stimulate the left temporoparietal area of the brain, underlying the neural network for tinnitus generation, along with the hearing aids. Some of the thinking came from work done in stroke rehabilitation by Dr Cathy Stinear who co-supervises Giriraj's work.

His questions probed the amount of current, frequency of treatment and length of suppression to get the most effective result. The work was done as a double blind placebo trial, which pleases his sense of curiosity along with scientific disciplines. All 40 participants received hearing aids, but only half received tDCS. Data from the end of the final phase is eagerly awaited, not only for its obvious scientific outcome but also for Giriraj's personal curiosity to see if perception matches reality.

The future is sound for the self-confessed Bollywood and Shortland Street fan, who describes himself as "an extrovert with a hankering to act and dance". Giriraj, wife Anita, and one year old daughter Khushi (happiness) are enjoying their time in New Zealand.

"If I get the option to do a postdoc in tinnitus intervention in New Zealand, then it would be perfect," he says thoughtfully.



Linking arms when suicide comes calling



Tāmaki's Dr Margaret Agee (far right) with (from left) Kathryn Barclay, Richard Charmley and Ginny Wilkinson

An upsurge in attempted and completed suicides among young people is a major current concern in the community, particularly among those who work in the field of youth mental health and well-being.

A recent event held at the Tāmaki Innovation Campus, 'Linking Arms when Suicide Comes Calling', drew an attendance of 100 school counsellors, the frontline mental health professionals working with young people in secondary schools.

Organised and co-sponsored by the School of Counselling, Human Services and Social Work and the Auckland branch of the New Zealand Association of Counsellors (NZAC), this event provided an opportunity for school counsellors to come together to reflect on their experiences of working with suicidal young people.

Their role involves support and intervention with suicidal young people, and dealing with the aftermath of completed suicides, including working with

the bereaved, managing the grief response in the school community, and preventing further suicidal behaviour and contagion.

The programme included discussion of a number of topics such as identifying and supporting the bereaved and the vulnerable after a suicide, managing the wider risk, managing the media, and the impact of social media. Workshops included risk assessment and suicide management, debriefing after a completed suicide, working with the crisis team, professional supervision through the crisis, and self-care: coping with the personal consequences.

Participants expressed strong appreciation for the informative programme which also acknowledged their complex specialised role. Dr Margaret Agee noted that this was the first of a series of events planned for school counsellors focusing on youth suicide, reflecting the long-standing partnership between the University and NZAC Auckland.

Tāmaki Innovation Garden gets a makeover



In early November, a team of enthusiastic volunteers gave the Tāmaki Innovation Garden a spring makeover. Vegetable and herb seedlings and seeds were generously donated by volunteers and the Tāmaki Innovation Campus Management team provided a plum tree and two feijoas. Don't forget, the garden relies on volunteers to water it and needs ongoing love and attention, especially over the summer months. You are welcome to plant at anytime, and don't forget to harvest!



Māori student success study wins award



LtoR Kirsty Weir (Ako Aotearoa – National Centre for Tertiary Teaching Excellence), Dr Elana Curtis and Erena Wikaire

Excellence in equity is walking the talk at Tāmaki Innovation Campus, with the Tātou Tātou/Success for All research project winning one of The University of Auckland’s Excellence in Equity Awards, from the record 20 applications.

As a university, we are known for our commitment to be an equitable, inclusive and world-class place to work and study. The crucible for this is the Equity Office, Te Ara Tautika, which oversees student and staff equity strategy, policy, projects, information, networks and advice.

Dr Elana Curtis (Director of Vision 20:20), led the Faculty of Medical and Health Sciences project, an evidence-based study targeting Māori student success in degree-level tertiary education. The aim was to understand the distinctive worldviews of Māori students as critical to the knowledge base that drives teaching and learning practices in tertiary health programmes.

She says while some evidence had been gathered about lecture based learning in universities, little was known about non-lecture teaching activities that complement traditional en masse teaching, with few

studies focused on representing indigenous student voices.

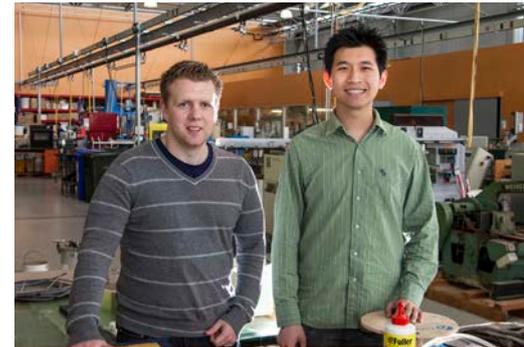
“Essentially in looking at what helps and what hinders Māori students, we asked what changes does research in this area suggest are needed to teaching and higher education practices in order to best support Māori success in degree-level study designed to prepare students for work in the health professions?”

“Based on our findings, quality tertiary teaching for Māori students within health programmes should: use effective teaching and learning practices; provide academic support that is culturally appropriate; provide pastoral support that is culturally appropriate; provide a culturally safe learning environment; and encourage cohort cohesiveness.”

Dr Curtis says the project brought together a varied range of disciplines from academic staff and beyond. The group is now focusing on publishing before the end of 2012.

For more information about the Excellence in Equity Awards go to www.auckland.ac.nz/equityawards.

Eco-friendly start-up wins SPARK



Oliver McGregor (left) and Shaun Tan

Centre for Advanced Composite Materials’ students, Oliver McGregor and Shaun Tan, have walked away with \$25,000 in seed capital and six months incubation with The Icehouse, after winning first prize in the Spark \$100k Challenge.

Their company, EcoFibre, which they formed with business student, Carl Jones, has developed an alternative to fibreglass which could transform the production of a wide range of products and importantly, help the environment.

The secret ingredients are the natural materials, flax and corn starch. Oliver says, “This alternative composite will be cheaper to dispose of and better for the environment, as it can be composted - fibreglass and carbon fibre products are usually burned.”

Oliver developed the composite, along with postdoc Miro Duhovic, while working on his PhD. Testing has shown that there is a 50 per cent improvement on any other natural fibre product in the market today.

The intention is to start with small niche applications to prove the technology. “We are still working on potential applications, but in the short to medium term are looking at orthotics and sporting goods.”

It is clear that Oliver sees a long term, exciting future for EcoFibre given the huge potential for the use of the product nationally and internationally - but, right now he is very busy completing his thesis.