LA TROBE UNIVERSITY

WInter 2009

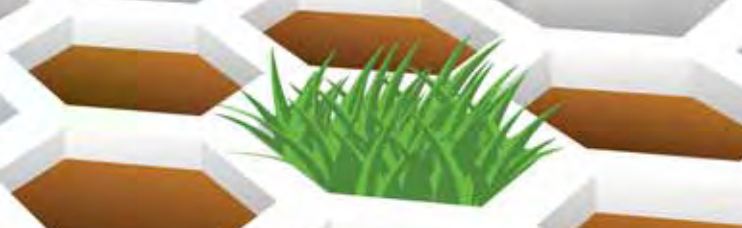
Bulletin

NEWS. KNOWLEDGE. LIFE.

SCIENCE FOR THE FUTURE

New world-class facilities – and wider collaboration

(PG3)



RURAL HEALTH
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Infinite Possibilities™

La Trobe University **Bulletin**

LA TROBE CONVERSATIONS
Tim Flannery talks with Robert Manne

The first of a lunchtime conversation series dealing with major issues of significance to Australia and the world, see page 19

New plan resonates in country Victoria

IN A MOVE THAT WILL INCREASE full-time student numbers by twenty per cent, international students by fifty per cent and equity group participation by ten per cent on country campuses, the University in June launched its new – and extremely well-received –strategy to benefit regional Victoria.

Vice-Chancellor, Professor Paul Johnson said the three-year plan would boost the economic, social and cultural fabric of communities surrounding regional campuses in Bendigo, Albury-Wodonga, Mildura and Shepparton.

Its release followed the Federal Government's vote of confidence in the University with a $60 million Budget allocation for the La Trobe Rural Health School in Bendigo (*see page 5*).

In Bendigo, where the University has 4,000 students, 170 from overseas, the leading daily newspaper, *The Advertiser*, described it as a 'bold plan' that could be 'the catalyst for an exciting new era for both the University and Bendigo'.

Pro Vice-Chancellor (Regional), Professor Hal Swerissen, said the plan gives more Victorians the chance to participate in higher education and meets workforce demands in the northern part of the State.

'We know that 18 to 20 year olds in regional locations are less likely to attend university than their metropolitan counterparts – 18per cent compared with 25 per cent.'

The plan will make access easier for people in regional Victoria by offering different modes of study and shared planning with partners including TAFE and local government.

Through its research strengths, the University will also contribute to environmental, economic and social transformations in regional Australia, Professor Swerissen added.

Working with key stakeholders it targets more high-impact research relevant to regional concerns. It will do this by building more local partnerships, increasing higher degree research students and boosting research depth on, and across each campus.


The Advertiser

BENDIGO BOXING STARS IN HOME BOUTS

La Trobe's brave new world

Uni seeks 50 per cent increase in international students in Bendigo

Bendigo already placed to become a global university city

Full steam ahead...

Leading-edge science for the 21st century

La Trobe University's ambitious $350 million plan developed in the past two years for next-generation science research, education and training has been secured.

This follows substantial government support in the May Federal Budget for the La Trobe Institute of Molecular Sciences and the launch in June of the State Government's Biosciences Research Centre on the main Melbourne campus at Bundoora.

Vice-Chancellor Professor Paul Johnson said the new facilities will significantly increase La Trobe's leadership in science.

Between them they will bring some 700 extra researchers to the University by early next decade – about 200 at the Institute of Molecular Sciences and 400 at the Biosciences Research Centre.

The La Trobe Institute of Molecular Sciences is geared to help solve some of society's big problems, including cancer, malaria and autoimmune diseases.

The Biosciences Research Centre – a joint venture between the University and the Victorian Department of Primary Industries – will focus on agricultural biosciences, helping crop and livestock industries and carry out studies into the impacts of climate change on food production, *see report page 5*.

In regional Victoria, the Federal Government also helped fund the University's Rural Health School in Bendigo. The school will produce 200 additional graduates annually, *see report page 7*.

All up, La Trobe received more than 13 per cent of the Federal Budget's education infrastructure allocation, more than any other university in Australia.

Largest investment

'These major developments, coming together after two years of intensive planning, are the largest investments by government in this University since it opened its doors in 1967,' Professor Johnson said.

'They demonstrate faith in the University and the vision that we have set ourselves for the next ten years. It's a clear vote of confidence in our key research strengths in biosciences and quality higher education'.

Professor Johnson welcomed the Federal Government's Budget allocation of $123.7 million from its Education Investment Fund to help spearhead the University's new science and regional health efforts.

He said $64 million will go towards establishing the $80 million La Trobe Institute for Molecular Sciences (LIMS) and close to $60 million towards the $89 million Rural Health School in Bendigo.

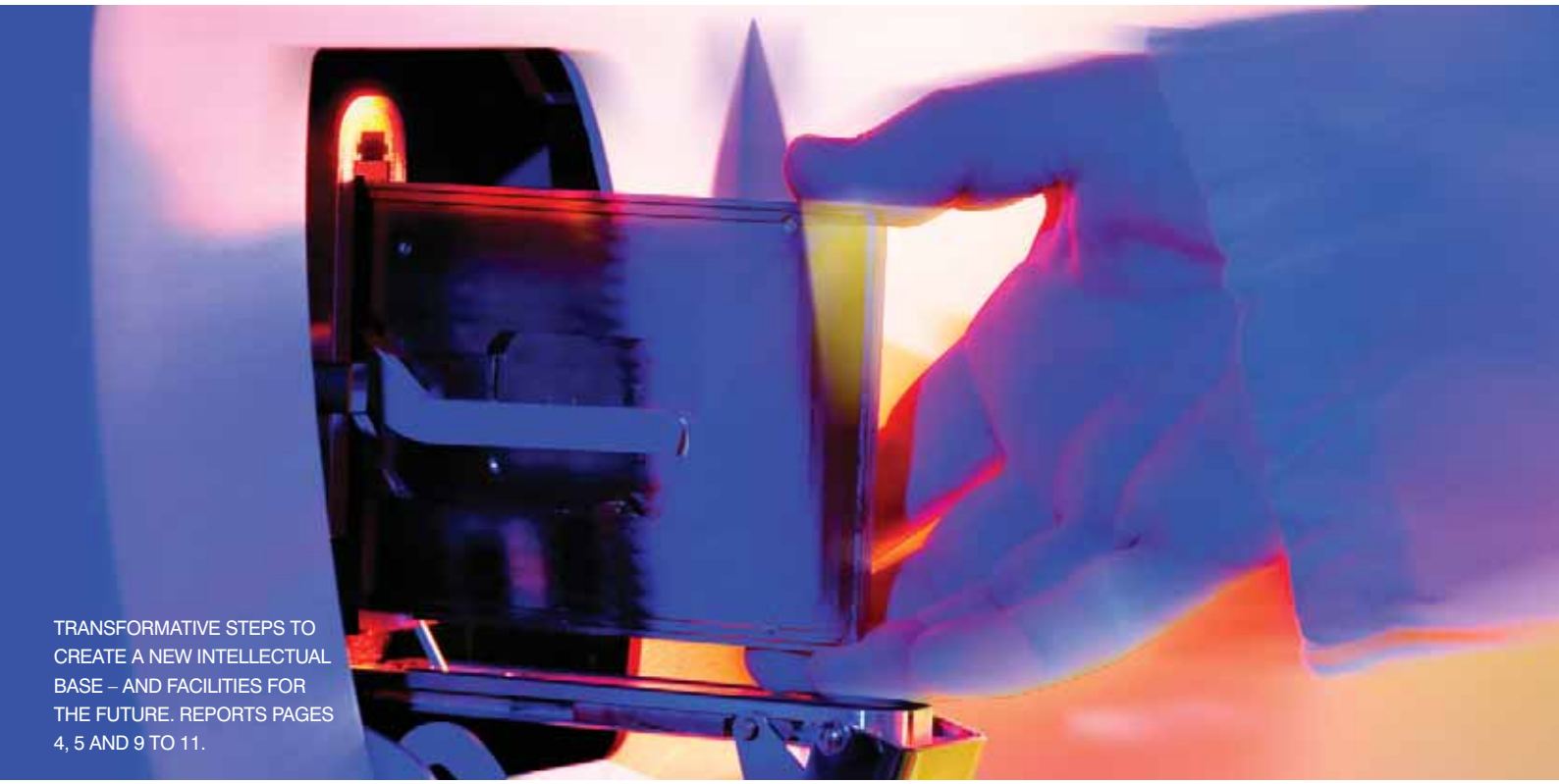
'These two projects are groundbreaking in their approach, setting the mould for next-generation science and regional health in Australia.'

The two projects are expected to train an extra 280 people to help alleviate a critical shortage of bio-scientists and health workers. In the short term they will also create more than 1,300 construction jobs in the north of Melbourne and Central Victoria.

'The University is deeply committed to these regions and our strength as an institution is directly linked to the sustainability of our communities,' said Professor Johnson. As well as generating new jobs, both these initiatives will play a major role in securing a stream of future workers for the community.

'Future success in scientific research and health depends on a strong pipeline of students,' said Professor Johnson.

continues PG04



TRANSFORMATIVE STEPS TO CREATE A NEW INTELLECTUAL BASE – AND FACILITIES FOR THE FUTURE. REPORTS PAGES 4, 5 AND 9 TO 11.

continued from PG03

World class facility

The La Trobe Institute of Molecular Sciences will be a world-class facility for molecular science, biotechnology and nanotechnology research and research training. It will focus on medical-related research, training doctoral and postdoctoral researchers, and also provide new research laboratories for undergraduate and graduate students.

Work is expected to start this year, creating some 800 direct and indirect construction jobs during the construction phase.

Professor Johnson described the Institute as 'a carefully crafted project critical for the long-term health of science in Australia'.

'With an extra 220 research positions at the Institute we will be able to expand our strong track record in scientific research and education, bring together many different disciplines and create a significant biotechnology research and development hub in northern Melbourne,' he said.

'We expect the University to earn an extra $10m each year in research income, contributing to our already outstanding reputation for grant and research income.'

The Institute will also offer an extended science outreach program to more than 2,500 secondary school students.

In 2008, La Trobe ranked 11th for competitive National Health and Medical Research Council grants, ahead of all Australian universities without a medical school.

International links too will be strengthened. For example the new Institute will work on liver cancer with the Mochtar Riady Institute for Nanotechnology in Indonesia.

La Trobe University is also part of the Government's new $50 million Australian National Fabrication Facility, the Bio-molecular Platforms and Infomatics project, the Cooperative Research Centre for Biomarker Translation, the Centre of Excellence for Coherent X-ray Science and home to the Victorian AgriBiosciences Centre. ○

SCIENCE

The art of new connections

THE FUTURE FOR SCIENCE LIES in forging novel research collaborations, bringing together physicists, chemists, biochemists geneticists and other disciplines, says Professor Nicholas Hoogenraad, Head of the School of Molecular Sciences and one of the key movers behind the new Institute of Molecular Sciences.

His School – with some 14 research groups comprising more than 60 postdoctoral fellows and 50 postgraduate students – attracts more than $12 million in external research funds annually. It has major programs in protein chemistry, molecular and cell biology, immunology and drug and vaccine development.

Professor Hoogenraad describes the new La Trobe Institute of Molecular Sciences as a first step, a 'transformative experience' to create a new intellectual base and facilities for the future.

'Biologists are beginning to realise that when we work together with other disciplines in the one environment it allows us to make unusual connections. It's when disciplines interact, that's when things really happen.

'For example, advances in physics have given us X-ray crystallography which helps biologists determine the three-dimensional structure of proteins, *see stories page 10.* This has led to the development of new pharmaceutical drugs.

'We need to go back to talking and collaborating, and using the full range of science and technology that's available today to produce new and useful results.'

To then translate those into commercial outcomes, he says, requires links with business and marketing so the benefits flow to the wider community.

'We feel in setting up this new centre of expertise in areas where we also have a strong technological base – with very fine equipment like mass spectrometry and nuclear magnetic resonance imaging – that we really should make it more available to other players, such as start up companies on our own campus, on the R&D Park and elsewhere, or to the EPA or the Police Forensic Science Centre, both of which are located near the University.

'And we also have a passion for integration of education programs, which includes bringing 15 year old school kids to University laboratories so they can do projects here and see first-hand that there is a future in science.'

Professor Hoogenraad, who has successfully forged such links between La Trobe biosciences, Ivanhoe Grammar and other schools, says the Institute will bring some 2,500 secondary school science students to the campus each year. ○

Professor Hoogenraad: when disciplines interact, that's when things really happen.

Work starts on $230m Biosciences Centre

Much of the research undertaken at La Trobe University – particularly in the area of agriculture – has been among the very best in the world.

That comment came from State Premier Mr John Brumby at a ceremony in late May. Mr Brumby was at the University to mark the start of construction of Victoria's new $230 million Biosciences Research Centre, about to take shape on the main Melbourne campus at Bundoora.

'That research, in turn, has enabled farmers in Victoria and across Australia to be at the leading edge of new technologies and drive productivity improvements,' he added.

Mr Brumby said work on the Centre, a joint initiative of the Victorian Government through its Department of Primary Industries and La Trobe, would begin five months ahead of schedule, generating hundreds of jobs for the state. It is expected to be operational in 2012.

'This will be a world-class centre for agricultural biosciences research and development and will boost Victoria's ability to make important scientific discoveries. It will stimulate economic activity in Victoria through investment in biosciences and biotechnology, while delivering research to boost productivity, fight diseases such as Equine Influenza and make Victoria's farms even more sustainable.' One of the big challenges for Australian farmers, Mr Brumby said, was productivity improvements to help them compete in the international marketplace.

'We need to do all we can to assist our farmers build their competitive base, and one of the best ways is through research and development. Much of the outstanding research and development that we do in this state is conducted here at this University.'

Mr Brumby estimated the project will generate 390 jobs during construction and inject around $620 million into the Victorian economy.

Global collaboration

La Trobe Vice-Chancellor Professor Paul Johnson said the Biosciences Research Centre is extremely important for the University, enabling research collaboration with world-leading scientists in a state-of-the-art facility, and boosting the national and international profile of the University.

'La Trobe is undergoing rapid change; we are growing and evolving. Scientific research is becoming an increasingly important part of the subjects we offer to our students and I have no doubt the research that will be done here will contribute to the health of Victoria's and Australia's agricultural bioscience sector for decades to come.'

Major Projects Minister Mr Tim Pallas said Plenary Research, comprising Plenary Group, Grocon Constructors, Lyons Architects and Honeywell Services, had been chosen to deliver the project which will provide internationally recognised research and development outcomes for the benefit of Victorians.

Agriculture Minister Mr Joe Helper said the BRC would be a landmark facility for Victoria's $11.8 billion agricultural sector. 'Victoria is a leader in protecting and working with our agricultural sector against biosecurity threats that provide a constant risk to our farming productivity,' he said.

'This important centre will help to further protect this sector by allowing us to rapidly detect and eradicate plant and animal pest and disease outbreaks.' ○

Premier Brumby with Vice-Chancellor Johnson.

A first for autism child-care

La Trobe University has been chosen by the Federal Government as Victorian service provider under its new national Autism Specific Early Learning and Care Centres program.

Minister Macklin, left, and Parliamentary Secretary Shorten at the University's Children's Centre, with Professor Prior, centre background, flanked by Dr Dissanayaka and La Trobe's Mr David Ensor.

In partnership with the Royal Children's Hospital, the University will receive $4 million over four years to develop such a centre, co-located with its Community Children's Centre on the main Melbourne campus at Bundoora.

The new centre – the first in the State to provide care and early intervention programs for children with autism as part of a regular child care facility – will begin operating next June.

It will provide 20 full-time places for children with an Autism Spectrum Disorder. The funds will be used to add a wing, the Margot Prior Wing*, to the existing building.

The new places will help reduce the overload on other early intervention services and make a meaningful difference to the lives of affected children and their families, particularly in the north and west of Melbourne.

Plans for the centre were unveiled at La Trobe University on World Autism Day by Minister for Families, Housing, Community Services and Indigenous Affairs, Ms Jenny Macklin and Parliamentary Secretary for Disability and Children's Services, Mr Bill Shorten.

Two other centres, one in NSW and one in SA, were also announced at the La Trobe launch. Minister Macklin said the new centres would draw together child care centres, universities and hospitals to develop best practice models of learning and intervention.

'The collaborative approach gives us an unprecedented opportunity to develop evidence-based models, collect significant data and make a major contribution to understanding autism,' Ms Macklin said.

Vice-Chancellor, Professor Paul Johnson welcomed the Federal Government's support and acknowledged a contribution of $500,000 by the Victorian Government towards construction costs.

'The University is strongly committed to the Government's agenda of increased access and participation by people from all levels of society. We are also indebted to the generosity of Mrs Olga Tennison through whose major financial contribution the University's Olga Tennison Autism Research Centre was established in 2008, enabling expansion of this important field of research and increased support for children and families affected by Autism Spectrum Disorders.'

Care, training and community resource under one roof

Director of the Olga Tennison Autism Research Centre (OTARC), Associate Professor Cheryl Dissanayake, said the new facility will help with family-centred early intervention as well as day care for children of working families and those in need of respite.

It will also provide professional development and education for future clinicians and workers in the field of autism and serve as a community resource for children with autism, their families and carers.

Dr Dissanayake said that with the increase in diagnoses of autism – where about one in 160 children are affected – waiting lists of up to two years for access to early intervention are not uncommon.

'This state of affairs is particularly sad given our knowledge that the earlier the intervention, the better the developmental outcomes for children.'

Researchers and clinicians from La Trobe University and the Royal Children's Hospital will work with Centre staff to develop early learning programs based on current research.

Early Days Workshop

The Government has also announced another arm of its autism package – a nation-wide 'Early Days Workshop Program' for parents and carers of newly diagnosed children aged up to six years.

La Trobe is involved in this initiative, with researchers at the OTARC developing workshops in collaboration with the Parenting Research Centre and other partners.

* Professor Prior, former Director of Psychology at the Royal Children's Hospital and Professor of Clinical Psychology at La Trobe University, is a leading specialist in family and child development. Now at the University of Melbourne, she has an Adjunct Professorship at La Trobe and Chairs the Advisory Committee of the Olga Tennison Autism Research Centre.

Regional Victoria benefits from new Health School

The new Bendigo Rural Health School has been described as a 'radical and original' model for health professional education and research across northern Victoria.

It provides two additional facilities, a clinical school and on-campus student accommodation.

Professor Johnson said the new School extends the University's relationship with Bendigo Health and the Victorian regional health sector, transforming health care outcomes and services in northern Victoria and leading to greater integration of regional higher education.

'Rural participation rates in health education will rise with the provision of some 800 additional student places, resulting in an extra 200 graduates each year.'

Federal Member for Bendigo Mr Steve Gibbons said he was delighted that the hard work by La Trobe University and his office had paid off.

'In rural Victoria, seventy per cent of the current workforce is over 45 and expected to retire in the next five to ten years creating a significant healthcare gap.

'Studies clearly show that students who study at regional campuses are much more likely to work in regional locations after they qualify.'

With expansion of the Bendigo campus a priority for the University, the new facilities support a recent Federal Government grant of $3.16 million to appoint four professors and supplements $24 million contributions by the Victorian State Government.

Cutting-edge labs for country dental students

DENTAL STUDENTS at the Bendigo campus have even more reason to smile – with an additional $1.9 million worth of the latest training laboratories now at their finger tips. The new facilities, a 30 chair simulation laboratory and 32 chair general purpose laboratory, were opened earlier this year by Victoria's Health Minister, Daniel Andrews.

They add to the existing 32 chair oral health laboratory that was completed in 2006, making the La Trobe dental program a leading health training provider for regional Australians.

Dean of Health Sciences and Pro Vice-Chancellor, Regional, Professor Hal Swerissen, said the new facilities significantly increased student access to the latest technology in dental education. The Bendigo dental school will also have regional clinics in Albury-Wodonga, Mildura and Melton, he added.

Head of Dentistry and Oral Health, Professor Peter Wilson said the laboratories – featured as the cover story of the May issue of the Australian Dental Association magazine – were 'cutting edge' and set the benchmark for dental and oral health education.

'They have audio visual systems that are fully integrated with teaching stations. This allows lecturers to deliver material to students in any of the laboratories, or to any combination of laboratories.

'One simulation laboratory allows students to access teaching material on their computers. I believe La Trobe University now has one of the best facilities of its kind in the world,' Professor Wilson said.

Health Minister Andrews, right, with La Trobe's Professor Wilson in the new laboratory.

Dr Pelkey at work in China.

Research in China leads 'new language' listings

While global biodiversity may be shrinking at an alarming rate, linguists are recording a burgeoning number of world languages. And this phenomenon – because of its political and social sensitivities – is of more than academic interest.

A new global listing published in the US includes a staggering 30 languages 'discovered' in China by La Trobe University graduate researcher Dr Jamin Pelkey and La Trobe linguist, Associate Professor David Bradley. Eighteen of these 'new' languages resulted from the work of Dr Pelkey and 12 from Dr Bradley's.

The international journal *Science* reported recently that of 83 'new' language listings from 19 nations published in the latest issue of the authoritative gazetteer *Ethnologue: Languages of the World*, Dr Pelkey's entries are the most for any single country.

The journal noted that the 18 new Phula languages described by Dr Pelkey have 'acquired something of an official status internationally because they have been assigned identification codes by the International Organization for Standardization (ISO)'.

'Such language codes are used in software, digital archives, and library collections and are an official recognition that a speech variety meets ISO's definition of a "language"', the magazine said.

Dr Pelkey's findings are based on work carried out from 2005 to 2006 in 41 mountain villages in Yunnan Province, Southwest China, part of a research project he began in 1998. The area has been home for non-Han ethnic groups for thousands of years.

In the *Science* article, Dr Pelkey, who now works in Canada, says centuries of isolation have widened the gap between various language groups descended from the same parent tongue. For example, the 500 speakers of Alo Phola can't understand speakers of a sister language less than eight kilometers away.

He explains many Chinese languages are being described only now, partly because there has been a tradition of lumping ethnic groups together. This has masked the extent of diversity. In the 1950s Yunnan's population of two million was divided into 20 official groups, even though 212 different ethnic groups were known.

La Trobe's Dr Bradley, who has worked in China since 1982, supervised Dr Pelkey's PhD studies. He says for reasons to do with geography, history, and politics China is 'one of the last places on earth where there are large numbers of unreported and undescribed languages. Until the 1980s it was forbidden to suggest that China had more than 55 languages'.

Dr Bradley suspects Yunnan alone may have more than 150 languages, and says Western and Chinese linguists are now surveying the region more thoroughly. Chinese linguists 'are still constrained by political realities as well as traditional macro-categories imposed by the Han Chinese majority on their minorities,' he says.

Nevertheless, in recent times, Chinese researchers have become freer to identify new languages and doors have also been opened for more foreign researchers.

The *Science* article notes that 'for some communities, linguistic description and discovery is welcomed, but others are uncomfortable with losing traditional affiliations'.

For example, Dr Bradley says that in Sichuan, speakers of some 25 languages of the officially recognised Tibetan ethnic group 'strongly reject any claim that they're anything but Tibetan, and don't want distinct languages to be identified as such.'

Ethnologue: Languages of the World lists 6,909 living languages from 156 countries. ○

Dr Li and Professor Parish.

MISSING LINK in seed development

Research to improve the nutritional value of oilseed products and the seed quality and germination of grain crops.

A TEAM of La Trobe University plant scientists led by Professor Roger Parish and Dr Song Li, have identified a missing link in the regulation of seed development. The researchers – whose work will link closely with the new Biosciences Research Centre (*see page 5*) – earlier this year had their study published in the prestigious journal *The Plant Cell*.

Professor Parish says all seeds have an outer layer of cells – a seed coat that has a protective function. 'In many seeds this outer cell layer produces mucilage which is secreted into the space between the cell membrane and the outer wall. 'Upon hydration, the mucilage expands, the cell wall ruptures and a mucilage hydrogel is formed around the seed. This mucilage aids germination by retaining water and is thought to protect seed from infection.'

The La Trobe researchers asked: what controls the formation of this outer cell layer of the seed and the production of mucilage? They discovered a 'missing link', a third protein that combines with two other proteins to form a complex essential for seed coat development and mucilage production. Professor Parish explains the newly found protein (MYB5) belongs to the 'so-called MYB family of transcription factors or "master switches". The protein complex binds to regions of DNA involved in the turning on and off of genes.

'When MYB5 protein production is prevented, the cell wall of the seed coat fails to develop normally and mucilage formation is inhibited.' So what does the MYB5 protein do? In other words, what genes does the complex regulate and what are their functions?

La Trobe researchers have also identified genes whose expression or is dependent on the 'MYB5-complex'.

Novel enzymes

'These genes,' says Dr Li, 'code for two novel enzymes that appear to be required for mucilage synthesis and a further novel enzyme involved in cell wall formation.'

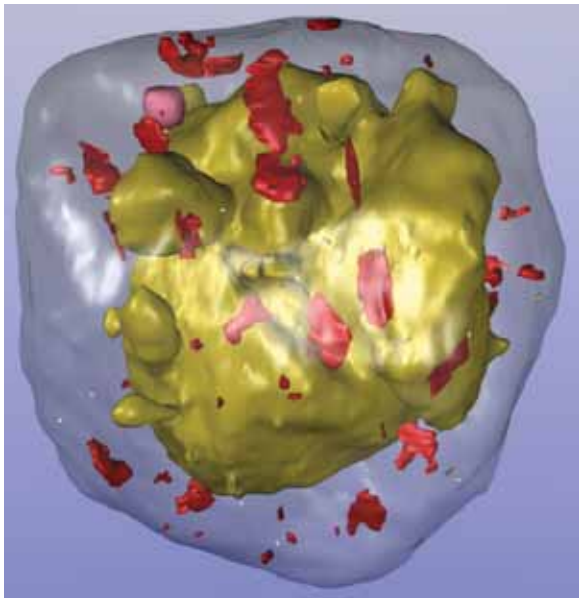
The MYB5-complex also controls the expression of an unusual MYB-like protein that acts as a negative regulator of specific genes. This controls, among other things, the production of anthocyanin pigments responsible for the colours of many fruits and flowers. Their research also found that MYB5 functions as part of a three-protein complex required for leaf hair (trichome) development. Trichomes appear to provide protection against frost and solar radiation and reduce evaporation in windy locations.

The researchers say their work will help provide a better understanding of how plant cell walls are made, and throw light on the way in which mucilage is synthesised.

Mucilage has many practical applications. It is used in food processing as thickening and stabilising agents, and in medicine as demulsifiers.

'For example, understanding seed coat mucilage and secondary cell wall synthesis will provide opportunities to improve the nutritional value of oilseed crops that are processed for oil and meal,' Dr Li says. 'And improving seed quality and germination will add value to grain crops.' The La Trobe team is also studying a number of other plant MYB proteins, one of which is required for pollen development.

That work has already resulted in a new system for controlling male sterility and the development of a technology for producing hybrid seed. Their laboratory was recently awarded an ARC Linkage Grant to support a collaboration with Pacific Seeds, resulting in total funding of $800,000. ○



X-ray imaging

A beautiful FRIEND

Three scientists talk about their work at the Centre for Excellence in Coherent X-ray Science

In the close-up world of X-ray imaging it's how things look on the inside that counts.

La Trobe physicist Associate Professor Andrew Peele has built a microscope which he says looks like a mess of stainless steel and cables from the outside. But at the heart of the instrument is a vacuum chamber in which prisms and beams of laser light interact to form a stabilising system that is not only beautiful but innovative.

The physicist's system is able to control vibrations and thermal motion from the environment to create a very stable platform for delicate measurements undertaken at a scale a thousand times smaller than a micron.

His high-resolution microscope has earned the nickname FRIEND, an acronym formed from Fresnel (a famous physicist) Imaging End Station but also an appropriate title for a piece of equipment that is opening up biological as well as physical worlds.

The clever piece of engineering has helped win researchers at La Trobe an extra three and a half years of funding from the Australian Research Council for research by the multi-disciplinary team at the Centre for Excellence for Coherent X-Ray Science.

The annual funding of $2.2 million is the culmination of three years of hard work during which the La Trobe researchers published more than 50 papers. X-ray microscopy has the advantage over other methods of being able to penetrate cells and look at structures in great detail.

BIOCHEMIST Professor Leann Tilley will use FRIEND to study the malaria parasite. X-rays are able to penetrate the walls of the host blood cell and show the digestive vacuole (stomach) of the parasite within an intact cell.

The best-performing malaria drug, artemisinin, extracted from wormwood grown in the alpine regions of China and Vietnam, attacks the vacuole of the parasite and Professor Tilley has been able to observe its action.

'It causes the vacuole to burst open and disintegrate,' she says. 'The important thing is that we've developed a model that is a good start for understanding how the drug works and ultimately undertaking drug screening.'

WHILE WORKING with physicists at the Centre, Dr Eric Hanssen from her laboratory performs multi-mode high resolution imaging and has obtained extraordinary pictures of the parasite that look like molten metal hurtling through space.

THE THIRD La Trobe group working under the umbrella of the Centre is led by Associate Professor Mike Ryan, who undertakes research into mitochondria.

The mitochondrion is known as the powerhouse of the human cell. It also plays an important role in embryonic development and regulating the internal stability of tissue.

One way of visualising the process is to look at the form of the human hand. The foetal hand is webbed. Spaces need to be formed between the fingers. The process that sculpts the body involves programmed cell death which is initiated by the mitochondria.

Dr Ryan would like to image the holes in the wall of the mitochondria which causes it to release factors that kill cells.

'No-one knows how the hole in the wall is formed,' he says . 'The super-resolution imaging methods being developed at the Centre will help us visualise the role of mitochondria in the process of cell suicide.'

Super resolution: Professor Tilley and Dr Peele.

Image of malaria parasite inside a human red blood cell.

Moving slowly towards blue

Adding colour to botany research

PURPLE AND LILAC carnations have been selling well for ten years now but innovators are forever restless. Blue is the Mount Everest for genetic floral engineering and those red pigments are still getting in the way of the ideal.

Dr Tony Gendall, a plant biologist at La Trobe, has won an ARC Linkage Grant to improve on nature's palette by creating a blue carnation. The project involves both fundamental and applied research into the way genes control pigments in petals.

The grant of $100,000 over three years is funding the work of PhD student Sonia Firorito in the Botany Department and in the laboratories of Australian bio-tech company Florigene.

Dr Gendall says that floral pigments are complex, perhaps more than Florigene first anticipated when the company first started up in 1982 with the dream of creating a blue rose.

Pigments known as anthocyanins control for red, orange, purple and blue in carnations. They are similar but of different chemical structure. 'Basically we want to stop red being made,' Dr Gendall says.

Five years ago a group in Japan used proteins to alter the colour of morning glory. These proteins were similar to ones being studied by Dr Gendall in Arabidopsis which control the level of acidity in cells.

The discovery led Dr Gendall to hypothesise that it was the pH in carnations that prevented them from turning blue. 'We hope to identify proteins in carnations that affect the balance of pH in the cells,' he says. 'Some of these proteins might be useful for modifying colours.'

The La Trobe group is taking a different tack to the one Florigene took in the creation of its Moondust and Moonshadow carnations.

The company introduced pigments into white flowers while the La Trobe researchers are testing a range of genes that affect colour.

'We are introducing them into flowers directly and quickly through transient assays,' Dr Gendall says. 'Our lab has a basic understanding of how to address the function of proteins, change their expression and test them rapidly.' He finds the industry research stimulating.

'It's a matter of try it and test the results. You take a young flower – red or purple – introduce genes or turn some off. You look at the way the plant grows flowers in vitro to see if the colour tends more towards blue. It depends on what you are putting in. If there is any change in colour that gene or protein is important.'

A lot of the basic physiology of carnations is not understood, he says, but the company sees the benefit of expanding the knowledge base.

'As an academic you have less and less of that kind of luxury. Funding is now based more on the national benefit for the economy than questions of fundamental research. Linkage grants make that obvious.'

Australian bio-tech company Florigene is based in La Trobe's R&DPark. It is one of Australia's oldest R&D companies and leads the world in genetically-engineered flowers.

Florigene research director John Mason is co-supervising the PhD student and the results of her research will become the property of the company through a licensing agreement with the University. ○

New radar tracks drama of the ionosphere

ONE HUNDRED KILOMETRES above the earth is a region so full of drama that eighteen radar transmitters are trained on it twenty-fours hours a day.

The transmitters send out high frequency radio waves from around the world to pick up evidence of storms in space, plasma irregularities, stray electrical currents, solar winds and fierce magnetic forces.

All of these atmospheric effects can wreak havoc with the systems that govern our global infrastructure. They can knock out GPS and HF radio, blow up power stations, corrode pipelines – and even interfere with individual banking transactions transmitted via satellite.

Physicists and engineers at La Trobe University are part of the international consortium of universities dedicated to the task of tracking this drama of the ionosphere. They recently received a $450,000 ARC Linkage Infrastructure grant with the University of Newcastle and the University of Adelaide for a nineteenth radar installation.

'This will be the first fully digital system,' says Principal Investigator, La Trobe's Dr Roman Makarevich, who is Australia's representative at the regular scientific meetings called to discuss the project.

Delegates from Australia, United States, United Kingdom, France, Japan, Canada, France and South Africa recently met at Newcastle where issues relating to the new installation were high on the agenda.

The new radar will be installed at Buckland Park, Adelaide where it will join two other bases – one on Bruny Island south of Tasmania and the other in Invercargill, New Zealand – collectively known as TIGER (Tasman International Geospace Environment Radar).

La Trobe physicists and electronic engineers led by Emeritus Professor Peter Dyson and Professor John Devlin have played a major role for more than a decade in building and operating these southern hemisphere bases. TIGER3 will increase the coverage in the region from the Southern Ocean and Antarctica to include Victoria, Tasmania and the south island of New Zealand.

Most of the ionosphere is now covered, Dr Makarevich says, with each installation operating in a cone measuring over four million square kilometres on the earth's surface, an area greater than those of countries like India or Argentina.

'They are the largest instruments in the world in terms of coverage,' says the enthusiastic researcher. 'They operate synchronously and in unison.'

The transmitted radio waves travel thousands of kilometres from their source until they encounter an irregularity in the atmosphere when they return to the receiver.

Dr Makarevich is hoping that the increased coverage will allow him to track 'very-fast plasma flows' – the ionised gas that streams towards earth from the Sun – that travels at speeds up to three kilometres per second and only occurs at latitudes to be covered by the new radar.

The aim is to improve ionospheric forecasting and, ultimately, provide real-time corrections for equipment dependent on signals passing through the region.

'Satellites can only provide information about a particular location every 100 minutes or so. Their time resolution is very limited. We are trying to improve that by several factors of magnitude, to below one minute resolution, to study origins of plasma flows and irregularities.'

Dr Makarevich say the work will impact on Australia's position as a world leader in developing high frequency radar surveillance systems, such as JORN, the Jindalee over-the-horizon radar network.

'Australia's ability to support these operations and remain a leader in these fields depends on its capacity to nurture expertise and train new personnel,' he says. 'The new radar system will play a crucial role in this respect, providing high-level training in radar technology and a test bed for the development of new instrumental and data analysis techniques.'

Stealth aircraft, for example, have a coating on their underbellies to protect them from radar. JORN uses the same principle as TIGER and works by bouncing its signals off the ionosphere to pick up the craft from above.

Professor Dyson, a foundation member of the La Trobe Space Physics Group, says the Federal Government has recognised the importance of this and other areas of space science in its recent budget.

'New competitive funding of $40m for programs in space science will provide an excellent opportunity for La Trobe to expand its research for the radar and other space physics projects, thereby helping build vital capacity in areas of increasing national and regional interest.'



Dr Makarevich, left, with Professors Dyson and Devlin.

Image: Jorgen Hedin

Imaginary friends, real benefits

CHILDREN with imaginary friends are better at learning to communicate than other children, according to La Trobe University psychologist, Dr Evan Kidd.

Dr Kidd and colleague Anna Roby explored the hidden world of imaginary companions in a bid to understand the benefits. The study of 44 children showed that the 22 children who had imaginary friends were better able to get their point across than were children of the same age who did not have one.

'Children with imaginary friends have a lot of practice at inventing interactions between their imaginary friends and themselves,' said Dr Kidd. 'We think that this is what facilitates their development of conversational skills – being in charge of both sides of the conversation,' he added.

The researchers also discovered that children with an invisible friend or personified toy had a better social understanding, were generally first born or only children and were very creative.

'They were all very creative. The children treat these "friends" as real, play with them throughout the day and refer to them in conversation.'

One child reported having a companion named Sarah, who had a pet dragon. Another enjoyed a friendship with an imaginary family, Mr and Mrs Driller who had two children.

'There was one child who had an imaginary tomato, "Bodder" and a potato called "Bun",' said Dr Kidd. The phenomenon of the imaginary friend is really misunderstood, according to Dr Kidd.

'People think it is rare, when in fact past studies have shown that around 65 per cent of children aged between three and nine had imaginary friends.

'Others think it is a red flag – thanks to the depiction of imaginary friends in popular culture like *Donnie Darko* or *Drop Dead Fred*, where the characters rely on imaginary characters due to some internal malaise'.

Rather, says Dr Kidd, this special type of pretend play appears to be an essential component of normal development.

Dr Kidd has gone on to establish in further research that the benefits of imaginary companions are long-lasting.

His study of university students showed that those who recalled having an imaginary companion in childhood were more creative, more achievement oriented, and more emotionally responsive than students who didn't have one. Interestingly, however, there was no difference between any of the 44 children in listening skills.

• Dr Kidd is a Charles La Trobe Research Fellow at the School of Psychological Sciences. His research interests include sentence processing in children and adults, the acquisition of complex sentences and verb argument structure, as well as verbal morphology and how children deal with lexical and syntactic ambiguity. Dr Kidd received his PhD from La Trobe in 2004. ○

FRESH SCIENTIST

Dr Evan Kidd was chosen as one of Australia's 'Fresh Scientists' in this year's national 'Fresh Science' competition.

For four days in June the event brought together a select group of sixteen scientists and honed their skills as science communicators. He and his colleagues then spoke about their research during an intense round of media engagements and other events including science sessions for schools, a dinner and a 'science in the pub' function.

As a result, reports of his work appeared in more than 200 media outlets throughout Australia and world-wide.

Fresh Science promotes new and interesting research by early-career scientists. It is supported by the Australian Government, Museum Victoria and *New Scientist* magazine to boost the profile of Australian science, encourage debate and provide role models for the next generation of scientists.

Spiders – and the world of stories

SCIENCE WRITER and La Trobe postgraduate researcher Lynne Kelly's latest book, *Spiders: Learning to Love Them* deals with the intriguing world of spiders around our homes and beyond.

A former arachnophobe, she overdid the cure and became totally obsessed with her eight-legged tormentors. For example, the chapter on sex is appropriately titled 'No-one does it like a spider'.

Through stories of spiders she observed in her home and garden, Ms Kelly explores the lifestyles of many species, including house spiders, wolf spiders, trapdoors, garden orb weavers and 'intelligent little jumping spiders'.

Her book also illuminates the world of arachnologists who struggle with studying 40,000 classified species and many more yet to be described.

Ms Kelly is doing her doctorate in the English Department as a natural history writer. She says *Spiders* is her 14th book. Her previous one was *Crocodile: Evolution's Greatest Survivor*.

'Writing these books, I became aware that traditional stories from Indigenous peoples around the world encoded detailed behaviour of the species they were watching.

'Aboriginal stories relating to the freshwater crocodile, for example, are significantly different to those of the saltwater. And reading Egyptian stories about scarab beetles,' she says, 'added a whole new dimension to watching dung beetles roll up poo.

'Artefacts from ancient civilisations demonstrate just how critical a detailed knowledge of natural history was to those who lived so close to the animals and plants they describe.'

Ms Kelly's particular interest is in the extraordinary methods by which a vast repertoire of stories has been handed down to this day from a world before writing. ○

Minister Ferguson launching Ms Cusworth's book.

Photo: Alice McBroom.

Ups and downs in Hopetoun

Federal Resources and Energy Minister, Mr Martin Ferguson launched La Trobe University writer Fran Cusworth's new novel *Hopetoun Wives* in May. Ms Cusworth lived for 18 months in the Western Australian mining town of Hopetoun.

Her novel tracks the ups and downs of the community leading to the closure of the nickel mine by BHP Billiton in January.

Ms Cusworth joined La Trobe's creative writing program as a PhD student. ○

Inside the Austen fan

La Trobe University academic Laura Carroll – who teaches Jane Austen, film adaptation and women's writing – takes her role as a cultural analyst to heart.

Ms Carroll, seated centre, at the Austen Ball in Canberra.

While other academics explore historicist, post-colonial and post-Foucauldian approaches to Austen's six novels – Ms Carroll recently added to her research repertoire a Regency-style dress which she wore to the Jane Austen Festival Ball in Canberra.

The ball was part of a festival where she mingled with other Austen fans to better understand how it feels to be a heart-struck fan from the inside. The festival included workshops on etiquette, music, and a dinner with Regency-era recipes.

Following another wave of Austenmania – with the screening earlier this year of *Lost in Austen* – Ms Carroll canvassed the views of the women who are not content to be passive readers, but who want to fully immerse themselves in the manners and feelings of the time by dressing up in period costume.

She also interviewed them by email after the ball in an empirical study of Austenmania in Australia, the results of which she will report to an international conference in July, at Jane Austen's home in Chawton, Hampshire, where there is a research centre devoted to Austen and other women writers.

Ms Carroll will also talk about Austen readers who get involved in historical re-enactment at a 'Reworking the Regency' conference to be held at the University of Melbourne in October.

Ms Carroll has a few hypotheses she wants to test. She believes the novels are popular because they are comedies, have happy endings and solve problems.

'Beyond that, they describe a social world in meaningful detail. Everything that's in the novels has significance that can be translated to the readers' own lives,' she says. Austen often includes readers amongst her characters and these have become emblems of an inner life – desires and imagination – that were not historically allowed.

'Everyone thought the Austen hype would phase out after the mini-series but in the last three years there have been at least 30 sequels published or produced,' she says.

The latest is a must for cross-genre aficionados – *Pride and Prejudice and Zombies* – now a book and soon to be a movie. Other readers can take their choice from a host of titles that privilege the male characters. *Mr Darcy takes a Wife* is a soft porn sequel while Mills and Boon is offering rewrites of the novels from the male hero point of view.

'I'm irritated by this kind of stuff,' Ms Carroll says. 'I force myself to read them but they're generally dreadful. I try and put that aside.

'What I love is the process of ordinary readers taking back the right to have their own take on Austen.'

Some fans post 'mash-ups' on YouTube. These are re-edited collages of bits and pieces of Austen movies put to popular songs which re-arrange elements of the stories to have them turn out in different ways.

Ms Carroll sees this as a democratic reclaiming of Jane Austen from the Hollywood juggernaut. Some fans have taken their adulation so far as to call themselves 'Janeites'.

'They use her first name to indicate a more deeply personal intimate friendship. They read with such passionate attention that they find different enjoyments in the text to the more detached reader.'

Ms Carroll has 60 people in her La Trobe course on Austen. Two are men. And there weren't a lot of men at the Canberra Austen festival either, she says. However, she has seen US films of Austen gatherings and there appeared to be a lot more men dancing with women fans than was the case at the Canberra ball. ○

First for Indigenous family

The first ten graduates from a unique training program for Indigenous family therapists were awarded their qualifications at La Trobe University in May.

They were trained at the La Trobe University Faculty of Health Sciences' Bouverie Centre in Brunswick.

The Centre offers Australia's first Postgraduate Certificate in Family Therapy designed specifically for Indigenous child and family workers who deal with at risk families in regional Victoria.

A second group of twelve therapists is just completing its training in Ballarat, and a third will begin later this year in Gippsland.

The La Trobe program is supported by the Indigenous Initiatives Unit of the Department of Human Services in partnership with Take Two, Berry Street which provides clinical family services throughout Victoria.

Manager of the Bouverie Centre's Indigenous Project Team, Dr Kerry Proctor, said the ten Indigenous child and family workers were from Rumbalara Aboriginal Community Co-operative in Shepparton, Njernda Aboriginal Community Co-operative in Echuca, Goulburn Valley Community Health Service (Shepparton) and Take Two, Berry Street. Dr Proctor said all graduates have worked as counsellors. 'Many are very skilful practitioners and clinicians, but very few had tertiary qualifications until they did this course,' she said.

Students met entry requirements through prior learning and experience of working with complex families in Indigenous communities. 'The La Trobe postgraduate qualification will help them to be acknowledged professionally,' she said.

One of the graduates is Shaun Coade, a Windajeri man and Manager of Family Counselling Services at the Victorian Aboriginal Health Service. He also works as a co-trainer and consultant to the Bouverie Indigenous Project Team to ensure the curriculum is delivered in culturally sensitive ways.

Understanding the whole person

Mr Coade said it was the family therapist's job to create a space in which a client and family members can 'talk safely so they are able to turn their experiences into a yarn that can be passed on to others'.

'"What journey have you walked to get to this place?" I try and understand the whole person,' Mr Coade said. 'The aim is to get a clearer understanding of where they've come from.'

In this way, Indigenous ways of dealing with trauma have been documented and included in the new program.

The graduates are, from right, front row: Frances Loader (Take Two, Berry Street), Shelley Drake (Goulburn Valley Community Health Service), Rhonda Dean (Rumbalara Aboriginal Co-operative). Back row: Shaun Coade (Victorian Aboriginal Health Service), Kaye Babarovich (Goulburn Valley Community Health Service), Hope Briggs (Rumbalara Aboriginal Co-operative), Ryan Dean (Take Two, Shepparton), Herb Goonan (Rumbalara Aboriginal Co-operative).

Two graduates not in the photo are Kim Warde and Anita Baxter-Waters from Njernda Aboriginal Co-operative, Echuca.

therapy

A unit of the course incorporates Mr Coade's 'Yarning Up on Trauma' training, developed for Take Two by Mr Coade in consultation with the Victorian Aboriginal Child Care Agency.

'Indigenous people suffer from many collective sources of trauma related to the on-going impact of genocide and the removal of children from their families,' Mr Coade said. 'Alcohol and mental health issues have also contributed to trauma experienced by Aboriginal families.'

Dr Proctor said Mr Coade's 'Yarning Up on Trauma' training has been developed into a 'wonderful resource book for workers in the mental health field', and the five-day training component based on the book is an integral Indigenous part of the mainstream curriculum.

The training is also supported by an Indigenous and non-Indigenous Advisory Group with representatives from Bouverie, Take Two and other Aboriginal Community Controlled Organisations.

Working with the team at Bouverie in family therapy training is Indigenous researcher, Robyne Latham, who is employed with the support of La Trobe's Indigenous Employment Scheme. 'The support of the Indigenous community is critical to graduates developing their roles as therapists and to help strengthen family systems,' said Dr Proctor.

'The word "family" is an emotive one in Indigenous communities and problems are seen as community rather than individual ones.

Addressing the first group of graduates, the Chairman of the Victorian Aboriginal Health Service, Mr Alan Brown, said it was an international disgrace that in the 21st century there was still a 17 year gap in life expectancy rates between Indigenous and non-Indigenous Australians.

Mr Brown called on graduates to go into the community and devise solutions to help close this gap. He also highlighted the importance of all health professionals to acknowledge Aboriginal families in their work. ○

Artwork, previous page, by Joanne Dwyer.

Minister Neville, centre, with Ms Frederico and colleague Dr Patricia McNamara, left.

New courses to help protect children and families

La Trobe University has been chosen to deliver two new courses in child and family practice – part of a State Government initiative to boost professional development and leadership capabilities of Victoria's child protection and family services workforce.

The new courses and a scholarship scheme were launched in June by Community Services Minister, Ms Lisa Neville. The courses, conducted part-time and beginning in August, are a one year Graduate Certificate in child and family practice and a two year Graduate Diploma in child and family practice leadership.

They were developed by the State Government and La Trobe University in conjunction with the University's Bouverie Centre, the University of Melbourne School of Social Work, Berry Street Take Two and the Victorian Aboriginal Care Agency.

Minister Neville said child protection and family services workers dealt with many complex and distressing circumstances. 'The development of these courses will build on work already being undertaken by child protection and family services by furthering their skills to better support families and strengthen the workforce.'

Head of La Trobe's School of Social Work and Social Policy, Associate Professor Margarita Frederico, said the new courses would build on the University's national and international reputation in family and child welfare studies.

'It is particularly exciting that we have a unique consortium of key academic and service organisations collaborating in developing and delivering these courses.'

The consortium is consulting with the local, national and international child and family services sector to enrich curriculum development and course delivery,' she said.

The Graduate Certificate will equip students with broader knowledge and skills to help them build relationships with families, work with them to make decisions and plans for their children's best interest and take care of themselves. It also offers advanced training to help deal with situations where there has been abuse and neglect.

The Graduate Diploma focuses more on management skills. It emphasises the latest research and skill development, and how to support and promote the best interests of children to make sure they are at the heart of all decision-making and practice. ○

Getting to know our catchments

LA TROBE GEOLOGIST JOHN WEBB is getting in on the ground level of a new multi-million dollar research centre devoted to managing Australia's water resources.

The enterprising researcher has spent the past decade in Western Victoria using his knowledge of geology to pinpoint sources of groundwater.

That solid foundation in the science of how groundwater systems work has paid off with his participation in the Centre for Groundwater Research and Training. The Centre will be co-funded at $6 million a year for five years by the Australian Research Council and the National Water Commission.

Ms Perveen with Dr Webb.

Dr Webb, Associate Professor in Earth Sciences, will run a $250,000 project within the Climate and Landuse Program at La Trobe, in conjunction with the Victorian Department of Primary Industry.

The project aims to provide in-depth answers to many of the questions raised by communities about the impact of farming practices on groundwater levels.

'Communities in Victoria are concerned about changes in land use, including the negative impact of tree plantations on water resources over the past decade,' says Dr Webb. 'For example, we know that trees can use a lot of water but we don't know if they are depleting groundwater reserves.'

Tax incentives have encouraged blue gum plantations for the pulp industry on otherwise marginal farming land, he says, and a new processing plant is planned near Hamilton.

There may be evidence, however, that the impact of the trees is ambiguous. Preliminary studies show they can drain water back into the groundwater after rain. Researchers have tracked run-off down the trunk and roots, but no-one has yet measured the contribution to groundwater reserves.

'We want to get real data to determine how much affect they really have,' the geologist says.

Dr Webb is supervising PhD student Fahmida Perveen to undertake more detailed research in three small catchments in western Victoria – Crawford River, Dundas Tableland and the Grampians.

Future Farming Systems, a section within the Department of Primary Industry, has recently committed $480,000 to installing bores and weirs to continuously measure groundwater levels and composition in these catchments.

Ms Perveen will measure flow rates at these locations and model the history of reserves by determining the age of the groundwater and recharge patterns.

She has come from Karachi, Pakistan, to do her PhD at La Trobe. The city of 15-20 million depends on groundwater supplies, she says.

'Many residents have bores in their homes. A family of eight to ten people needs a lot of water,' she says. Ms Perveen studied the seasonal variation and quality of groundwater in Karachi and found high levels of nitrate.

'The quality is not good. Groundwater should be an issue in Karachi but it's not,' she says. Sewerage lines need to be repaired, but it is not a high priority for the current authorities.

The best thing about doing research here, she says, is the knowledge that her results will be used to 'give benefit to the common man'. ○

Hardy little fish is struggling

A TOUGH LITTLE FISH that looks like a golden sardine has been saved from possible extinction in the drought-stricken Murray-Darling system by an ecologist at the University's Mildura campus. Iain Ellis has raised two generations of the Murray hardyhead – *Craterocephalus fluviatilis* – from egg to adult in tanks at his research centre.

'It's a unique species,' he says, 'one of a few salt tolerant fish in the Murray-Darling system.' He believes ancestors of the fish may have survived cycles in weather fluctuations and flood regimes since the Murray-Darling was part of a vast inland sea.

A unique ability to withstand high concentrations of salt has allowed the species to survive while most other small fish have perished.

'In the boom-bust environment of the Murray-Darling it has managed to find a refuge niche,' says Mr Ellis. 'Yet, despite really good survival strategy, it's now struggling due to regulation of the river system and the ongoing drought.'

Originally, the fish would have occupied hundreds of wetlands. River regulation in the 1900's meant most wetlands have either dried up or become permanently filled.

'Like desert kangaroos, the Malle fowl – and even Mallee farmers – the Murray hardyhead is sturdy, tough and adapted to the semi-arid environment,' Mr Ellis says.

Late last year, the keen fish ecologist trapped about 200 samples of the fish in rapidly-drying Lake Hawthorn, relocating them to the Mildura campus nearby. Only two lakes in Victoria, near Swan Hill and one small wetland near Mildura, now support the fish – and these have all required topping up with environmental water.

Mr Ellis is now campaigning for the fish to be moved from the 'threatened' to 'critically endangered' list. This will help conserve the fish and their natural habitat. In the meantime it is breeding well on campus.

The fish reach up to eight centimetres in length and are strongly associated with a salt-tolerant plant called Ruppia that looks a bit like bird feathers. They hide amongst its fronds, eat bugs attracted by the plant, and their eggs adhere to the leaves.

The first captive-born fish began breeding recently and the population appears to be free of diseases and in good genetic health. They have a short breeding cycle and live for only 18 months in the wild, which makes them vulnerable to extinction in times of low river flows and drought. ○

from PG02

La Trobe CONVERSATIONS

The University has launched a new lunchtime conversation series dealing with major issues of significance to Australia and the world.

In the first of these, internationally acclaimed scientist and conservationist Professor Tim Flannery spoke with La Trobe political scientist, author and commentator Professor Robert Manne, who chairs the series.

The two men discussed politics, international relations, sustainability and the environment in front of a capacity audience on the main Melbourne campus at Bundoora.

Professor Flannery, who is also Chair of the Copenhagen Climate Council and a La Trobe graduate, criticised the Rudd Government's handling of carbon emission and climate change, especially in granting billions in concessions to the States and old coal-fired power generators. He also spoke out against the energy industry lobby for engaging in 'blackmail, not negotiation' in order to extract concessions.

He agreed there was no other country in the western world where there was so much media coverage of climate 'denialism or skepticism', and urged young people to raise a 'determined voice'.

'I think action campaigns that remain within the law, but are still hard hitting towards the offending industries are important.' A lot of people committed their lives to protecting forests, he added. 'It's a very noble and wonderful thing. But they don't realise that those forests are in peril not just from the axe man but from climate change as well.'

The audio is available via iTunes and the University's News Page on the web *www.latrobe.edu.au/news* along with a video extract. ○

The *La Trobe University Bulletin* is published by Media and Communications, La Trobe University.

Articles may be reproduced with acknowledgements.
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Articles: Rhonda Dredge, Ernest Raetz, Penny Underwood.
Photos: La Trobe University PDI
Design: Creative Services, La Trobe University (CS00031)
Printed: by Immij on Envi stock

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Fence me in!

OUTFOXING THE URBAN PREDATOR

Melbourne has the highest density of foxes in the world and many are attracted to La Trobe's campus after dark.

Rangers often see them crossing the road – after feasting on food scraps in the University's central Agora – on their way for a meal of nature's gourmet biodiversity in the nearby woodlands and wetlands of the La Trobe Melbourne Wildlife Sanctuary.

Get rid of one fox and another soon takes its place, snuggling into the rich pocket of resources awaiting the urban predator.

'They're like the gangs of New York,' says George Paras, Head Ranger at the Sanctuary. 'You see an alpha male training up the next generation of cubs on how to best exploit the resources at their paw tips.'

Now, thanks to a new predator-proof fence around the Sanctuary, all that feasting should come to an end, giving the host of small native animals that live in the reserve a chance to discover their niche in life.

One picturesque mound, dotted by tall, sinewy Yellow Gums and covered with a healthy carpet of twigs and branches, is home to White's Skink *Egernia whitii*. Until it was protected by the fence, the locally-rare skink, which lays its eggs in rotting logs, never had such a chance to proliferate in peace.

Mr Paras estimates that there are still about a dozen foxes resident in the Sanctuary and that 50 or so outsiders visit on a regular basis to sample lizards, frogs, waterfowl and possums.

When the new 2.2 kilometre fence is finished the foxes will be cleared out, giving zoologists the chance to study how the native fauna respond to their absence.

Mr Paras is predicting an increase in water fowl and quail populations. He says there will be no need to worry about a surplus of small fauna, for flying predators like goshawks, kites and barn owls will move in to take over the top-predator niches vacated by the foxes.

The La Trobe Melbourne Wildlife Sanctuary was one of the first ecosystem restoration projects to be undertaken in Australia. It was established in 1968, a year after the University opened.

It is now home to eastern grey kangaroos, echidnas, skinks, lizards, ringtail and brushtail possums, sugar gliders and eight species of bats. It is a wild place for the wild animals of Melbourne and foxes don't belong there, says Mr Paras.

Andrew Stocker, the Sanctuary's Education and Information Coordinator, says the public have donated more than $80,000 towards the 2.7 metre high wire fence. ○

Wetlands on La Trobe's Melbourne Wildlife Sanctuary and resident White's skink.