Grants enhance University's capabilities

Three exciting projects from different parts of the University, all designed to advance both teaching and research, have gained funding from round three of the Innovation and Development Fund managed by the Tertiary Education Commission.

Leaders of the projects succeeding in gaining funding are Professor Alan Merry (Anaesthesiology), Associate-Professor Paul Bonnington (Mathematics) and Professor Peter Gluckman (Liggins Institute).

Virtual patient helps train doctors

For Professor Alan Merry and his colleagues in the University's Advanced Clinical Skills Centre at Mercy Hospital, the Growth and Innovation funding will provide a highly sophisticated patient-simulator to help in the training of medical professionals.

The simulator is an interactive computerised manikin which is able to breathe and respond to drugs; it has a pulse and blood pressure, gives out an ECG signal and can be given an anaesthetic.

It can even die, says Alan Merry, without any of the usual medico-legal consequences. In fact, a simulator death gives the opportunity to teach people about managing the aftermath of a crisis.

The high-fidelity dummy is to form part of a whole simulated operating theatre, complete with video feedback for trainees. The funding will also provide ancillary equipment, including an anaesthetic machine and monitors, and salaries for staff who will help develop new courses.

The new resources form part of an ongoing development of wider teaching initiatives, involving a range of medical professionals at under-graduate, postgraduate and professional advancement levels.

The simulator will be used in professional training for medical, nursing and pharmacy students, anaesthetists, general practitioners, postgraduate nurses, technical staff and paramedics. It will provide experience in resuscitation and crisis management and will be used to enhance existing courses for cardiologists.

It will also be invaluable for interdisciplinary team-work, giving the different medical professionals a chance to collaborate, as in the real world – while traditional training tends to keep them isolated in separate groups.

Another function of the simulator will be to enable research into the effectiveness of simulation as a teaching method and into human factors and team-work in the operating room.

The funding application was made in collaboration with Professor John Windsor (Surgery), who has played a lead role in setting up the Advanced Clinical Skills Centre, and with Associate Professor Jennifer Weller from the Faculty Education Unit of Medical and Health Sciences who will be helping implement some of the courses and research projects. A new staff member, Dr Jane Torrie (Anaesthesiology), will also be helping implement the programme.

Hands-on experience for secondary students

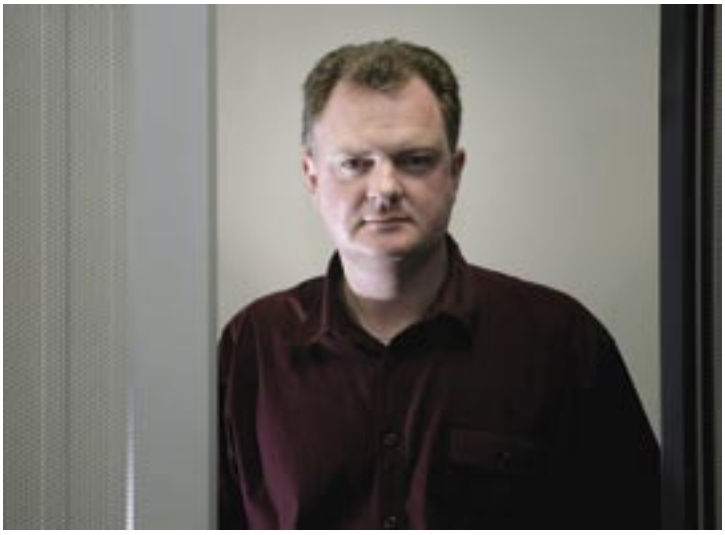
Funding won by Professor Peter Gluckman, Director of the Liggins Institute, will allow for a unique secondary education centre to open within the institute.

The only one of its kind in New Zealand, this education centre will bring secondary school students into a successful research institute to learn hands-on research skills.

The grant will be used to develop a formal curriculum and resources for the facility, and will fund research to assess the impact on pupils and teachers who take part in it.

The centre will provide pupils with experience of procedures such as gel electrophoresis and PCR that are commonplace in biological research yet difficult to teach in schools. They will hear from practising scientists about how these techniques and research strategies are applied to solving problems of modern medicine.

The project will build on an existing Liggins programme that helps bridge the gap between secondary and tertiary education in biology and biotechnology. It is headed by the Liggins Institute in collaboration with the School of Biological Sciences and the Faculty of Education.



Paul Bonnington

Super highway for researchers

The Internet is now too clogged with information and some of the infrastructure is too old to run at the speed required for advanced research purposes, says Associate Professor Paul Bonnington (Mathematics), Associate Dean for IT in the Faculty of Science.

The project for which he and his team gained funding, entitled BeSTGRID (or Broadband enabled Science and Technology Grid), is designed to help researchers collaborate more effectively by speeding up the flow of information, and providing shared scientific databases and computing resources.

This is a joint project led by The University of Auckland, with Massey and Canterbury Universities also participating.

The next generation Internet for Research and Education is arriving this year, connecting computers and sharing information at a much greater speed than the original Internet.

Designed to be used exclusively for research and education, this next generation Internet will connect New Zealand's universities, Crown Research Institutes and the National Library, providing links also with similar systems in other countries, including the United States, Britain, Japan and Australia.

In response to academic demand, the government granted funding last year for the system's infrastructure, which will be available for use by July. Paul and his team will then begin to build capability into the network.

"Once the highway is in place," says Paul, "it's up to us to put the cars on the road."

The first of three generic themes encompassed by the project is an access grid for online collaboration which will allow video-conferencing with many participants, typically in ten or 20 different locations.

Though access grids already exist in the University, these will be enhanced to make them much more suitable for scientific research, allowing researchers to participate in virtual research communities (known as co-laboratories), working together simultaneously, sharing information on multiple screens.

The second theme is the science grid, which allows large amounts of data to be stored and made available in other locations.

There has been a huge explosion in storage requirements in some disciplines such as biological sciences where, for example, the sequencing of genomes is generating huge data sets. There is also a growing need to transport the data more efficiently than on the Internet. This will be the purpose of the science grid.

The third theme, entitled grid computing, allows for the sharing of computational resources, initially between Auckland, Massey and Canterbury.

A great deal of scientific research is now computational, says Paul, based on simulations or data-matching which use large amounts of computer space and time. The plan is to link some of the computational resources of the three universities so that they become one big virtual computer.

A researcher feeding data into a computer has no wish or need to know where the data is processed, Paul explains, any more than a person turning a light on in Auckland needs to know where the power is generated.

What the researcher wants is to find the answers, and the computer grid itself will allocate the data to the space where it can be processed most efficiently.