Recognising research benefits in the health system

Clinical Professor Denis King is Chair of the Illawarra Shoalhaven Local Health District Governing Council and a board member of the Illawarra Health and Medical Research Institute. This is an extract from a presentation on Wednesday 1 June to the IHMRI Research Network.

“There’s a lot of reform happening in NSW Health at the moment and therefore in the Illawarra Shoalhaven Local Health District. With these changes happening, we are going to need to play to our strengths. We can’t take anything for granted and need to look at where the opportunities are and maximise them.

One of these areas of opportunity is establishing a broad academic culture in the Illawarra Shoalhaven Local Health District. It is probably fair to say that academic activity in this area perhaps does not match that of more metropolitan areas, but there are plenty of strengths we can draw on to change this.

One of the strengths we have is that the Illawarra is an ideal health services research environment, with a population of approximately 350,000 that is relatively stable, that broadly represents the national population, and where around 88 per cent of the health care residents receive is provided in the region.

We also have the Illawarra Health and Medical Research Institute, the Australian Health Services Research Institute, and the Graduate School of Medicine - a major focus of which is community health - which are of huge benefit to the local health system. The relationship between these University centres, and the Illawarra Shoalhaven Local Health District, is going to be critical in terms of establishing a broader academic culture throughout the entire system, with all the benefits that brings.

IHMRI has a number of very high quality fundamental and basic research departments. One can neither undervalue nor even anticipate the contribution of this research.

This was driven home to me a few years ago when I was privileged to be asked to become a member of the strategic advisory committee of the John Curtin School of Medical Research (at the Australian National University), which was rewarding, and instructive, and taught me a little bit about serendipity in these things.

Why would a school as well established as the John Curtin School need an advisory committee? More Nobel Laureates than any other Australian research institution; and long standing practical, political and emotional support.

The issue is that things change. When it was established, it was well funded directly by the Commonwealth and its future seemed fairly certain. The funding was secure and indexed... the caveat, and there always is one, was that it could not apply, because of this privileged funding position, for any other competitive Commonwealth funding, including from the NHMRC.  

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Clinicians needed for study

A new study into improving the effectiveness of online education is looking for physicians, nurses, and other health professionals including pharmacists and dietitians to complete an anonymous, online survey.

The study - Online Patient Education (OPE) for chronic disease - is the research project of UOW PhD candidate Naffisah Mohd Hassan, from the Faculty of Informatics.

The survey has UOW ethics approval and is anonymous. It is available online at www.uow.edu.au/~nmh876/

Naffisah can be contacted at nmh876@uowmail.edu.au

With the passage of time, as the balance of funding shifted from direct Commonwealth to the NHMRC, its funding base was eroded in relative terms. The capital stock declined, and it fell on hard times. You can't take anything for granted in this business, and this is one example of that. Due to the efforts of the Director of the JCSMR at the time, Professor Judith Whitworth, who convened this particular advisory committee, it has all turned around now and the John Curtin School is prospering again.

One of the people on that committee was Peter Doherty, who was awarded the Nobel Prize with Ralph Zinkernagel [in 1996], for their work on T-cell receptors between 1973 and 1975.

While their conceptual work was outstanding, it was the concentration on T-cell function following the AIDS epidemic sometime after the work was done which gave this work a relevance and prominence that may have even exceeded Peter’s expectations.

It was true basic research, it was done with a veterinarian background and it was done to just understand the process and then, 15 years later, it became extraordinarily relevant – I think that’s true of basic research and I think IHMRI does that, does it well and should continue to do that.

The problem is that while we should never underestimate the potential impact of basic science and we should always support such research, in today's health environment we also need to find more immediate benefit from such research collaborations.

This brings me to the whole issue of academic culture as a component of adding interest to what we all do in the health district on a daily basis. Our prosperity in the system will depend on our ability to adapt to a changed environment where cost effective service delivery becomes paramount, whilst seeking to maintain clinical academic standards.

For this reason, a major collaborative project – the Illawarra population health information platform – has been proposed to create a research information partnership between the local health district and the health centres at the University of Wollongong mentioned earlier.

The aim is to properly assess new health initiatives and use the linked data to undertake research into perhaps the causes of disease, but certainly the relationship between the health status and healthcare utilisation and predictors of health outcomes.

It would allow us to track what happens to people, and to see the effect of particular medical or health interventions in what happens to them in terms of outcomes. It will give clinicians and researchers in the Illawarra region the strategic advantage of getting international competitive research funding, because of their access to a unique dataset that the project will hold.

It will be a resource for those clinicians who have questions they wish to have answered about the effect of various medical interventions, and I believe it could be a way of generating an academic culture throughout the entire health service.

We have significant challenges, but in many ways the Illawarra is an ideal base for this project – there’s a confluence of talent, imperatives, and what may be for NSW a unique academic and health environment.

We should pursue this enterprise for our mutual benefit and, in the first instance, for the benefit of the people of the Illawarra and Shoalhaven and in due course, the wider Australian community."
International guest impresses in schizophrenia lecture

The complexity of factors that contribute to the onset of psychosis was the focus of a lecture by one of the world’s most highly cited schizophrenia researchers, hosted by IHMRI.

Nearly 200 researchers, clinicians and health professionals attended the only free talk Kings College Department of Psychosis Studies Professor Sir Robin Murray gave during an Australian visit. His lecture covered the contribution of social adversity to schizophrenia based on a UK study conducted in Nottingham, Bristol and South East London, noting that the top four social factors increasing the risk of psychosis are parental deprivation, child abuse, migration and social isolation and exclusion.

“Schizophrenia is a disorder at the interface between the brain and the social environment,” Sir Robin has said.

The connection between cannabis use and psychosis was a significant focus for the lecture Schizophrenia: From the street to the striatum. Sir Robin presented the results of studies showing that for those who used cannabis less than weekly, the average age of psychosis is 31.5 years; and for those who use it daily, it is 26.5 years.

Similarly, cannabis with higher potency (more of the hallucinogenic chemical Tetrahydrocannabinol) has been shown to cause an average earlier age of onset of psychosis.

Sir Robin also addressed the developmental cascade of genetics, obstetric events, neurodevelopmental factors and social contributors that interplay in the development of psychosis.

Sir Robin is based at the London Institute of Psychiatry. He is co-investigator for the NHMRC project Vulnerability markers in the association between cannabis and schizophrenia, led by Dr Nadia Solowij from UOW's School of Psychology. During his visit, he also took part in a planning meeting for this $500,000 research project.

Sir Robin rose to prominence in the 1980s after developing the neurodevelopmental hypothesis of schizophrenia — a model that provides the framework for most schizophrenia research today.

Project highlights presented to IRT guests

A video of a son’s conversation with his father, who has Alzheimer’s disease, gave emotional potency to the presentation of an IHMRI based research project that is looking for a saliva or blood-based diagnostic for the devastating disease.

Dr Francesca Fernandez-Enright used the video as part of her presentation for guests gathered at the IRT Research Foundation 2010 Grant Update on Thursday 5 May. Her project Prevention and early diagnosis of Alzheimer’s disease using gene expression profiling in a case-control population in the Illawarra is one of three research projects at UOW funded by the IRT Research Foundation.

The findings of another IRT funded project examining the role of a particular type of protective protein—heat-shock chaperones—in age-related disease was presented by Dr Justin Yerbury at the event. Justin and Dr Heath Ecroyd are leading the research which aims to contribute to the development of therapeutic drugs to combat age-related diseases including Parkinson’s disease and Motor Neurone Disease.

The third research update was provided by Professor Sandra Jones, Director of the Centre for Health Initiatives at UOW, on the project Different approaches to encourage healthy behaviours in self care facilities that improve an individual’s wellbeing and lifestyle. This project is being conducted within three IRT residential communities to explore the most effective strategy to reinforce personal attempts to meet health goals in the community setting, and to identify environmental features which support or impede individual and group actions to promote healthy lifestyles.

The IRT Research Foundation supports research projects that assist in providing a greater understanding of the ageing process and contribute to the care and wellbeing of seniors. Applications for the 2011 grant round closed in April with outcomes expected to be announced soon.
Cardiolipin is a unique phospholipid found only in mitochondria. The peroxidation of cardiolipin triggers apoptosis (programmed cell death) and under certain conditions this occurs 30x more readily than other phospholipids. This project will test the hypothesis that cardiolipin is able to undergo oxidation at very low oxygen levels. This project will test the hypothesis that cardiolipin is able to undergo oxidation at very low oxygen levels by comparing oxidation of cardiolipin and other phospholipids at different oxygen levels in both purified form and in mitochondria. The low oxygen levels which occur in heart ischemia and cardiovascular disease may make the potential peroxidation of cardiolipin a very damaging property.

Is cardiolipin's secret that it peroxidises at very low oxygen levels? Implications for myocardial infarction

Professor Paul Else; Dr Todd Mitchell; Professor Peter McLennan; Dr Andrew Jenner

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In vitro and in vivo characterisation of a versatile topical platform for the treatment of disease

Dr Jason McArthur; Dr Roy Himes; Dr Simon Moulton; Dr Nick Adams

Skin infections represent a large burden on global health systems and topical treatment is hampered by the poor skin permeability of most anti-infective drugs. This current project will determine the ability of a novel topical delivery vehicle to deliver different classes of antibiotics and test the ability to treat a bacterial skin infection with penicillin. An effective topical delivery system for anti-infective drugs will facilitate the development of new and safer treatment strategies for infectious diseases.

Heart and skin, and babies and miners, to benefit from grants

A study aiming to reduce dehydration and obesity among Illawarra miners by increasing water consumption is one of four projects funded by the IHMRI grants scheme.

Associate Professor Vicki Flood will lead a project to set up an intervention – where soft drinks will be replaced by water – among employees of the local coal industry to see if the hydration and weight status of the miners is improved.

The IHMRI grants are funded to encourage the beginning or continuation of projects that have collaborative and population health outcomes.

In announcing the grant recipients, IHMRI Executive Director Professor Don Iverson said the review panel was “impressed with the quality of applications” and found the “new collaborations and breadth of research ideas encouraging.”

“IHMRI was established to encourage, build and facilitate projects that are cross-disciplinary, collaborative and translational – that is, projects which translate findings to inform our understanding of health, or which lead to improved treatments in medicine. I’m pleased that our grant program is supporting projects which meet these aims.”

This year, the scheme has provided up to $25,000 each to four projects. They are:

Supporting workplace environments to promote healthy lifestyle among employees of the Illawarra mining industry

Associate Professor Vicki Flood; Dr Susan Furber; Associate Professor Brian Davies; Dr Vinokumar Gopaladasani

This project aims to develop, implement and evaluate a lifestyle intervention trial among employees of the Illawarra mining industry. Workers in the mining industry are at increased risk of dehydration and obesity so this pilot will focus on increasing water consumption and reducing sugary drink consumption by targeting individual behaviour, workplace environment changes and policy review. It is expected that health benefits including better hydration and improved weight status will strengthen external grant applications to extend research to diet and physical activity in the future.

The Wollongong birth cohort study

Professor Brin Grenyer; Associate Professor Chris Georgiou; Associate Professor Vicki Flood; Associate Professor Peter Caputi

This project aims to recruit family units spanning 3 generations with collaborative and population health outcomes and mortality at 18 months of follow up.

Of these aims.

More information

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More information

Nutrition News

Associate Professor Karen Charlton was recently awarded the Research in Practice award, given to the best judged presentation for an established researcher, at the 29th National Dietitians Association of Australia Conference held in Adelaide in May.

The study investigated the risk of mortality and other adverse clinical outcomes of older patients after hospital discharge and was a joint study with clinical dietitians in the Dietetics Department of the Southern Hospital Network at Wollongong Hospital.

More information


Professor Linda Tapsell provided a plenary on Nut Consumption and Energy Balance at an international symposium on Nuts and Dried Fruits in Health and Disease as part of the XXX World Nut and Dried Fruit Congress held in Budapest, Hungary 20-22 May 2011.

More information

Infrastructure boost

Six of 11 grants awarded by UOW under the Research Infrastructure Block Grants (RIBG) program will benefit IHMRI and associated health and medical researchers.

The Australian Government Department of Innovation, Industry, Science and Research provide the RIBG block grants on a calendar year basis to eligible higher education providers to enhance the development and maintenance of research infrastructure. The block grant is then administered by the individual universities.

The following research infrastructure, which will support research under the IHMRI umbrella, will be purchased following successful applications:

**Sample preparation**
- Histopathology Infrastructure: paraffin embedded sample preparation
- Ultracentrifuge for preparation of nucleic acids, lipoproteins and cellular organelles

**Molecular analysis**
- High-throughput nanosizer for protein and nanoparticle characterisation
- Protein and DNA electrophoresis equipment: Bioanalyser to measure quality of nucleic acids and proteins and -80 freezer for storage of labile biological material

**Activity and body motion monitoring**
- ActivPALs
- The Myon Radio-Telemetry EMG System

A summary of research equipment and facilities at IHMRI is now available online at: www.ihmri.uow.edu.au/facilities/equipment/

Introducing

Tanya Levchenko, Technical Officer, IHMRI

Tanya started in February, joining IHMRI’s excellent laboratory tech team. She moved from Melbourne, where she was employed as a Laboratory Technician in the Australian Genome Research Facility at the Walter and Eliza Hall Institute working in the Wallaby Genome Project. Earlier, in her homeland Russia, she worked on a number of projects related to diagnostic of HIV, developing and implementing ELISA and Western blot test systems.

Bethany Pye-Respondek, IHMRI Reception

Many researchers and students already know IHMRI’s new receptionist and administration assistant, Bethany Pye-Respondek. Bethany has been with IHMRI since late January and has proven to be extremely professional and capable in this role, which includes handling telephone and face-to-face enquiries, deliveries, inducting new building occupants, and assistance with clinical trial enquiries and participants. Bethany joined us from the Kiama Cove Motel.

Fiona Roberts, Clinical Trials Assistant

Fiona has joined the Clinical Research and Trials Unit as Clinical Trials Assistant. Her role will include supporting clinical trial coordinators, facilitating the process of participant screening, and trial management. Fiona is a registered nurse, most recently working as a Nurse Educator in an acute care setting (perioperative). Her extensive nursing career includes 10 years working in ICU and perioperative settings and 20 years in both public and private settings as a Neurophysiology Technician. She has combined her career with ongoing academic studies and has included science, psychology and education within her formal qualifications. She is currently completing her Masters in Education (Adult Ed.).

Michael Clee, Clinical Trials doctor

Michael has extensive experience in general practice and emergency medicine. As a hospital based Career Medical Officer, he spent 8 years working in Anaesthetics with a particular interest in obstetric anaesthesia and pain management. He studied Italian language for a year in Florence and maintains enthusiasm for all things Italian. Now graduated almost 38 years, Michael recognises the importance of continuing medical education/professional development programmes in the alignment of experience and up to date medical practice. He is looking forward to providing clinical input to the projects undertaken at IHMRI.

Jean Marshall, PhD candidate

Jean is undertaking a PhD with Associate Professor Chris Georgiou, Professor Noel Tait and Professor Peter McLennan. Jean's PhD is investigating the use of a humidified CO2 surgical microclimate to protect the abdominal cavity during surgery. This novel therapy may reduce the risk of surgical site infection. Jean is testing proposed mechanisms of actions of the therapy with a human trial at the Wollongong Hospital, an animal trial at UOW and laboratory testing at IHMRI. Jean comes to IHMRI after seven years working as a research scientist for a medical device manufacturer in New Zealand. She has an undergraduate degree in Engineering (Biomedical, Hons I) and Science (Sport and Exercise Science), and a Postgraduate Certificate in Health Sciences. Jean completed her PhD proposal in 2010 and is now completing her PhD part time, while looking after her son, Devin, who was born in December 2010.
Annual summit held at IHMRI

IHMRI hosted around 40 schizophrenia researchers on 17 June for the Schizophrenia Research Institute’s Developmental Neurobiology Panel annual meeting. The meeting reviewed the progress of their latest research where panel members identified in a collaborative approach relevant genetic and molecular changes in a cohort of schizophrenia brains. In group discussions, new potential avenues for research collaborations were developed drawing on the expertise of each researcher.

The Schizophrenia Research Institute (SRI) provides over $150,000 annually in research support for researchers based in the Centre for Translational Neuroscience at IHMRI investigating the neurobiology of schizophrenia. It also provides access to donated tissue for research purposes.

The meeting, coordinated by Dr Kelly Newell, was attended by SRI CEO Professor Vaughan Carr, the SRI Macquarie Group Foundation Chair of Schizophrenia Research Professor Cyndi Shannon Weickert, and the Director of the IHMRI Metabolic Conditions theme Professor Xu-Feng Huang. Participating scientists came from UOW, Neuroscience Research Australia, the Garvan Institute of Medical Research, the University of Sydney, the University of NSW, ANSTO and the University of Newcastle.

At the end of the day’s discussions, the visitors toured the IHMRI facility. “It was a great opportunity for us to host this meeting,” Professor Huang said. “Feedback from our guests on the day has been extremely positive. Their impression of IHMRI is sure to continue our good relationship with SRI and will further our success to attract funding for collaborative projects.”

Project Air launch

The team behind the treatment of personality disorders project, known as Project Air Strategy, have launched their new website. It contains information for people with a personality disorder, their families and carers, information for health professionals and opportunities to engage with the project through facebook, twitter and youtube.

Project Air is a NSW Health funded program. The Project Air project team, based at IHMRI, work in collaboration with clinicians and staff within the South Eastern Sydney and Illawarra Shoalhaven Local Health Districts and Justice Health to deliver services aimed at improving the availability and quality of personality disorders treatment in the surrounding communities.

The website can be found at www.ihmri.uow.edu.au/projectairstrategy

Did you know?

This year is the University of Wollongong’s 60th Anniversary. To mark this milestone the theme of 2011 is ‘Share your Story’. This year is an opportunity to recognise the role staff, students, alumni and the wider community have played in making the University what it is today. The University wants to hear your UOW experiences and celebrate your successes to help build a picture of UOW: past, present and future.

Initiatives for the 60th anniversary include an interactive timeline and an online gallery of days gone by at UOW. The University hopes to collect more stories, videos and images throughout the year to be published on the 60th Anniversary website for future UOW generations to view. Anyone who has a story or photograph about their connection with UOW is welcome to contribute at www.uow.edu.au/about/60/shareyourstory

An interactive digital time capsule will also be compiled to paint a picture of University life in 2011.

Help us promote your work

As part of the program for the year want to promote the diverse and cutting edge research taking place at UOW. Tell us about research or projects that are taking place in your area.

Georgina Wiles: gwiles@uow.edu.au
Network Member Profile

Dr Marco Petasecca
Research Fellow, Centre for Medical Radiation Physics (CMRP),
Faculty of Engineering, UOW

Describe your research area?
- Design and development of detectors for radiation medical instrumentation. This area also includes also radiation imaging, dosimetry for radiation therapy and radiation protection for radiation exposed people and professionals.
- Design of electronic readout for such kind of sensors and data handling for the post-processing.

Your career began in Italy based on research on radiation in space – how did you come to be involved in medical radiation research in Wollongong?
Radiation hardness is a primary characteristic of electronic devices suitable for deep space or even low earth orbit missions of satellites or space-crafts. My research activity was primarily focused on the design of sensors to monitor radiation activity during very long flights (Mars is the next target). More than 4 years ago, Professor Anatoly Rozenfeld, Director of CMRP, had identified that CMRP needed someone with experience in radiation sensors, and from there I was successful in joining CMRP which is recognised worldwide as one of the most active research groups in the development of radiation detection technologies.

What current projects are you involved with? Do any of these involve internal or external partnerships?
As a Research Fellow, I am involved in most of the projects of CMRP. Currently, we are running three projects funded in the framework of the NHMRC Development and Project Grant schemes and two by the ARC Development Project scheme. These projects are mainly related to 2D or 3D dosimetry reconstruction for several different applications such as external beam radiotherapy based on 3rd generation linear accelerators or for brachytherapy (cancer treatment based on the use of gamma sources directly implanted close or into the tumour volume).

All these projects aim to improve the instrumentation accuracy or create a completely new approach for quality assurance of the radiation treatments, mitigating or avoiding the catastrophic effects of wrong dose planning or malfunctions of the machine. Naturally, this aim can be achieved only with the direct support of medical doctors and Cancer Care Centres (such the Illawarra Cancer Care Centre, the St. George Cancer Care Centre, the Prince Of Wales Hospital and Liverpool Hospital) which provide an invaluable contribution to the definition of the specs of the instrumentation and by the feedback during testing.

What do you enjoy the most about your work and research?
I love the creative part of my role and I’m glad to be part of the CMRP. This well linked, locally and internationally, research centre, which has many adjunct fellows from hospitals and industry, has the aim to further achieve excellence in research and development in the field of radiation instrumentation and measurements. This means that we need to have a deep knowledge of the physics involved in the medical treatments and the imagination to overcome the “current” limits of the technology.

Why did you join the IHMRI Network and what do you hope to get out of membership?
Visibility is one if the main issues for a full time researcher. Attending international workshops and conferences help keep in touch with partners and collaborators overseas but the local research facilities and key persons are also equally important. IHMRI plays a fundamental role in creating and developing this kind of network.

Coming up – IHMRI Events

Health services research
IHMRI Seminar III
Professor Kathy Eagar
Director, Australian Health Services Research Institute
Tuesday 9 August 2011
6pm, IHMRI Lecture Theatre (Bldg 32, G.01),
University of Wollongong

Clinical research and the
Graduate School of Medicine
Spring Networking Evening
Professor Alison Jones
Dean, Graduate School of Medicine, UOW
Wednesday 14 September 2011
5.30pm – 7.30pm, City Beach Function Centre,
1 Marine Dr, Wollongong
In drug discovery and clinical research, understanding how cellular pathways are altered in disease is fundamental to identifying novel targets for intervention. Often these changes are the result of altered gene expression.

The current international standard for measuring gene expression in tissue ranging from histology samples, cell cultures and patient blood samples is quantitative real-time polymerase chain reaction (qPCR). Since 2010 IHMRI researchers have had the ability to perform high-throughput qPCR analyses using the Roche light cycler LC480 qPCR instrument, purchased with a Research Infrastructure Block Grant (RIBG) grant, awarded by UOW.

qPCR allows the measurement of gene transcript (mRNA) levels by reverse transcribing to DNA and amplifying the DNA proportional to the amount of original gene transcript in the tissue. The amplification products generate a fluorescent signal that is detected in real time via a high performance optical system. The more fluorescence, the more gene transcript (and by inference, gene expression) in the original sample.

Previously, to measure differences in gene expression between tissue types, the Northern blotting technique was used. This required large amounts of tissue and was limited in the number of comparisons that could be made in one experiment. Furthermore, only large differences in highly expressed genes could be detected, via chemiluminescent visualisation.

Now, using the qPCR technique gives greater sensitivity (the ability to detect 2-fold differences in expression), the ability to perform high throughput experiments in 96 or 384-well format, and less of the precious sample material is required to generate data. The sensitivity of fluorescent chemistry means differences in low level transcripts can also be detected. Using commercial PCR Arrays we can analyse gene transcription in numerous relevant pathway or disease-focused genes simultaneously.

The Roche LC480 instrument is well suited to molecular investigations in neurobiology, metabolic conditions, cancer, immunology, and other biomedical and clinical research areas. IHMRI’s neuroscientists have used the LC480 extensively in the study of schizophrenia, Alzheimer’s disease and obesity.

For example, Researchers in the Centre for Translational Neuroscience use the LC480 to measure the expression of over 22 pathway genes that might link a genetic predisposition to schizophrenia with the actual development of the disease when differentially regulated in schizophrenia-affected and non-affected brains. The results will allow the identification of new targets for antipsychotic drug development.