

- Boost for Cancer Research
- A Moment with Associate Professor Greg Hannigan
- Centre for Innate Immunity and Infectious Diseases
- Harold Mitchell Travel Awards
- Grant Creates PhD Scholarships
- UROP Presentation Day Showcases Students Talents
- Indonesian Collaboration Goes from Strength to Strength
- Helen Macpherson Smith Trust Grants Executive Visit

Announcing the Ron Evans Cancer Research Fellow

Post Doctoral Fellow, Dr Steve Greenall, is the inaugural recipient of the Ron Evans Cancer Research Fellowship.

The Ron Evans Cancer Research Fellowship was established to honour the memory of the late Ron Evans AM. The Fellowship was announced at the inaugural Ron Evans Golf Day in November 2007. Funds raised at the Golf Day support the Fellowship.

The Fellowship aims to provide an opportunity for an outstanding early career scientist to study basic biology in an effort to learn more about the growth and development of different cancers to discover new approaches to cancer prognosis and therapy. The Fellowship will promote and enhance the research conducted in Centre for Cancer Research at MIMR.

“Being awarded the inaugural Ron Evans Cancer Research Fellowship is a huge honour. Having a Fellowship such as this, at an early stage in my career, will open many opportunities for me”, said Dr Greenall.

Dr Greenall grew up wanting to be a veterinarian, but after completing a science degree he developed an interest in pursuing a research career. He was drawn to the field of cancer research after two members of his family passed away due to cancer.

Dr Greenall joined MIMR's Centre for Cancer Research to work with Associate Professor Terry Johns in the Oncogenic Signalling Laboratory. His research is focused on a protein called c-met that is linked with the progression of normal cells to cancerous cells. C-met is vital for foetal development and, in adult life, for wound healing by promoting the movement of cells and the development of new blood vessels.

Over time, the c-met protein can develop mutations that result in changes in its function. Some of these mutations are closely associated with the initiation and progression of colon and other cancers including brain and breast.

Dr Greenall's research will investigate the way different c-met proteins signal to the cell to induce the changes associated with cancer development. In addition, he will look at ways in which these different c-met proteins interact with other proteins in the body and whether these interactions are capable of inducing cancer.

“I look forward to attending the 2008 Ron Evans Golf Day to speak to participants about my research.”

“I'm hopeful that this research will provide new information about cell signalling in cancer and potentially identify new therapeutic targets for some forms of cancer, particularly for the treatment of colon cancer”, said Dr Greenall.



Dr Steve Greenall

From the Director's Desk:

Commercialisation plays an important role in the transfer of laboratory findings to patient outcomes and is vital in gaining the greatest results for all stakeholders from funders to scientists to patients.

MIMR research aims to develop new technologies from the laboratory stage through to clinical evaluation and beyond; towards product outcomes of diagnostic or therapeutic potential. Patients, with the diseases that we are trying to make a difference for, have the greatest potential to gain from successful commercialisation ventures.

Promising technologies are often developed in partnership with investors in start-up companies which build on the research base and capabilities within our Institute. Beyond such developments, we also seek collaborative research and development opportunities with biotechnology and pharmaceutical companies.

As well as achieving greater patient outcomes, commercialisation of our research also provides additional financial resources for the

Institute in an increasingly competitive climate. During 2007, approximately \$3.5 million was generated for the Institute through various commercial activities including Cooperative Research Centres, contract research and licensing income.

MIMR has a solid track record of successful commercialisation of its research. Monash IVF and Pulmosonix, a company created by the Ritchie Centre to develop airway monitoring devices, are just two that have had significant impact on people in the community.

On a smaller scale, we have also licensed cancer cell lines developed by our scientists to overseas companies. These companies are using our tools to develop therapeutics, which in the future will assist people with cancer to have access to better treatments.

MIMR continues its strong commitment to capturing value from our research through commercial opportunities, in terms of both generating financial returns and in developing the transfer of technology to achieve greater outcomes for patients.



Bryan R S Williams
Professor Bryan Williams,
Institute Director

Boost for Cancer Research



(L-R) Prof Neil Watkins, Dr Elizabeth Williams, Prof Bryan Williams, Ms Rosemary Pacquola and Assoc Prof Greg Hannigan

The Centre for Cancer Research has been granted \$72,958 from the Percy Baxter Charitable Trust towards the purchase of a new upright fluorescent microscope.

Rosemary Pacquola, Senior Financial Consultant at Perpetual, visited the Centre for Cancer Research to meet with Institute Director Professor Bryan Williams and Senior Scientists to deliver the gift on behalf of the Percy Baxter Charitable Trust.

Centre for Cancer Research Senior Scientist, Dr Elizabeth Williams, escorted Ms Pacquola on a tour of the recently refurbished laboratories, before meeting with Professors Bryan Williams, Neil Watkins and Associate Professor Greg Hannigan to discuss the current research.

The new microscope will assist the staff and students within the Centre to further their understanding of the genetic cause of cancer, tumour growth and development and potential diagnostics and therapeutics for a range of cancers.

A moment with:

Associate Professor Greg Hannigan

Associate Professor Greg Hannigan joined MIMR at the beginning of 2008 as one of three new senior scientists in the Centre for Cancer Research (CCR). Before joining MIMR, Greg was conducting his research at the Toronto Hospital for Sick Children.



Greg's research is focused on how and why particular signals cause cell growth. He is particularly interested in molecules that promote tumor growth including the molecule integrin linked kinase (ILK), which he discovered in 1996.

Tell us a bit about yourself:

I'd like to be taller.

I am Canadian, one of four brothers, and have spent all of my life excepting the last few months, living and working within a one hour flying radius of Toronto. My better two-thirds are my wife Donna and daughter Felicity, who are back in Toronto. Growing up, I was very much into sports like water and snow skiing, football (American), baseball, canoeing, swimming, ice hockey, and curling (which is essentially lawn bowling on ice). I was very fortunate in enjoying a very active and outdoorsy upbringing along the northern shores of Lake Superior.

What was your original inspiration to pursue a career in science?

Truthfully, it was Jacques Cousteau and the Calypso (not the John Denver song!) that I used to watch on TV as a kid. Although I didn't speak French or wear Speedos, I thought that a job as a biologist, to actually get paid to swim with dolphins in the warm blue waters of the South Pacific or Caribbean, would be just fantastic. Accordingly, I enrolled in an undergraduate marine

biology program at a land-locked university in central Canada! Recognising this flaw in my plan, I switched to microbiology. I was fascinated that things you couldn't see could make life good (beer, wine, bread), but also have such devastating effects on human health. Studying viruses and bacteria led me to molecular biology and I saw the incredible potential for the new tools that were being developed in the mid-1970s and 80s to vastly increase our knowledge of many diseases. The potential to provide new opportunities for intervention against these diseases was very exciting. My interest to understand cancer at a molecular level informed my PhD studies on interferons with Bryan Williams. Interestingly, now that I'm at MIMR I have realised my original inspiration of doing science in the South Pacific! Sans dolphins, however.

What are some of the changes you have witnessed since you began your career?

Edison introduced the electric light bulb, which really extended my lab hours!

The parallel developments of computers and networks, with gene technologies that rapidly generate huge amounts of data, means that we are getting new information at a dizzying pace, almost unimaginable when I was a graduate student. For example, a gene expression experiment in the 1980s would take three days of work to look at perhaps

12 genes. We now routinely get expression data for 25,000 genes in a single experimental run of an afternoon! The powerful computer algorithms required for the analysis and organization of these huge forests of data necessitate the interaction of molecular/cell biologists with people in the computational biology and bioinformatics fields. At the end of the day, however, in order to make sense of the forest we do still need to tackle the individual trees, like ILK. So, I guess I'm a bit of a molecular lumberjack, and that's OK.

What has been your career highlight to date?

The discovery of ILK was tremendously exciting. We knew it was a very important finding for the cell adhesion field that we work in, but appreciation for ILK's importance in other fields has also grown dramatically. For example, we now know that it is essential for the proper development of many organs, such as the brain, kidney and heart. ILK functions as a signal coordination centre, and it's hyperactivation contributes to the development of many common cancers such as breast, colon, prostate and lung. For me, the most gratifying outcome of this discovery would be the development of effective and safe anti-cancer drugs.

You have come to MIMR from the Toronto Hospital for Sick Children – why MIMR?

I'm very excited to be part of the Centre for Cancer Research

at MIMR. It is a rare opportunity to 'get in on the ground floor' of a new venture. Bryan's vision for CCR is very attractive to me and I'm keen to play a role in establishing a high scientific profile for the Centre, both nationally and internationally.

What are you hoping to achieve in the Centre for Cancer Research?

Already I've been talking with the other CCR Senior Scientists, and have identified exciting collaborative projects for our groups to pursue. Pooling our expertise and resources will drive synergistic interactions. I expect we will be doing very high impact science so that, when people here and abroad think of Cancer Research in Australia, MIMR will be at the top of their radar screen.

What challenges are ahead for you this year?

Building a lab and research group from scratch in a new country is a real challenge. The funding environment in Australia is very competitive. Getting and maintaining funding is a constant challenge facing scientists. I also need to learn the system here to identify and attract high quality trainees to my lab. I have a number of scientific collaborations in Canada, which will require some extra effort to maintain due to the distances involved. Given the mix of people here at the CCR and MIMR, I see these challenges as great opportunities to expand my own scientific horizons.

It's All in the Name: Centre for Innate Immunity and Infectious Diseases

The Centre for Innate Immunity and Infectious Diseases (CIID) is the new name for what was previously known as the Centre for Functional Genomics and Human Disease. The new name has been chosen to reflect the evolution of the Centre's research focus over the past ten years.



Professor Paul Hertzog

Centre Director Professor Paul Hertzog explains:

The Centre for Functional Genomics and Human Disease was one of the founding four research Centres of the Institute in 1999. Scientists in the Centre were pivotal in developing the emerging technologies of functional genomics, utilizing

the sequencing of human and model organism genomes and gene targeting in mice models. These technologies have been applied to understand the genetic and molecular basis of a wide range of human conditions, including, infectious and inflammatory diseases, cancer and neurodegenerative disorders

particularly as components of Down syndrome.

With time, our projects led us to focus on aspects of how the immune system regulates these diseases and the technologies and expertise we have developed in the past will now be focused on this field.

Research in the newly named Centre for Innate Immunity and Infectious Diseases (CIID) focuses on the molecular regulation of the innate immune response. This early immune response determines how the body responds to infection by pathogens. It initiates the inflammatory

response and can modulate the development of some cancers.

By understanding the molecular pathways that regulate these processes as well as their normal, physiological roles, CIID scientists aim to contribute to the development of new approaches to the prevention, diagnosis and

treatment of disease using drugs and prevention vaccines.

CIID is made up of three laboratories:

- Molecular Regulation of Immunity
- Cytokine Signalling
- Toll-like Receptor Signalling

Staff and students working

in CIID have collective multidisciplinary expertise in molecular biology, signal transduction, protein interactions, cell biology, immunology, infectious disease, functional genomics and bioinformatics and transgenic techniques for generating gene knockout and transgenic mice as models of human disease.

Toll-Like Receptor Signalling Lab

Toll-like receptors (TLR) are implicated in infectious diseases and a broad range of other diseases such as chronic obstructive pulmonary disease (COPD) and autoimmune diseases such as atherosclerosis, asthma, hepatitis, lupus, diabetes, arthritis and cancer.

Dr Ashley Mansell's Toll-Like Receptor Signalling Lab uses a range of cellular and molecular biology methods, combined with powerful bioinformatics and array technologies, to provide a molecular understanding of innate immunity.

It is hoped that through a greater understanding, scientists can use this information to develop therapeutics to inhibit TLR-mediated chronic inflammatory diseases.

Cytokine Signalling Lab

The projects undertaken in the Cytokine Signalling Lab, lead by Dr Brendan Jenkins, encompass numerous molecular biological and genetic approaches to better understand the mechanisms by which uncontrolled signal transduction from the Interleukin-6 (IL-6) cytokine family leads to disease states.

This research will ultimately assist in identifying genes which can potentially be used as biomarkers for screening and early detection of specific diseases, such as gastric cancer and chronic obstructive pulmonary disease (COPD), and also targets for the design of therapeutic treatment strategies.

Bioinformatics

A team from CIID has spent the past two years developing two bioinformatics database systems which will be available as an international resource for scientists and biologists. The Centre's research focus on innate immunity lead to the development of these systems.



Dr Shamith Samarajiwa

Bioinformatics involves the analysis of biological information using computers and statistical techniques. It is an interdisciplinary science that enables the analysis of large amounts of biological data

generated by new biological technologies. The bioinformatic methods are used to assist scientists to understand the biological reactions to infection and disease.

Two systems have been developed by Post Doctoral Scientist, Dr Shamith Samarajiwa and undergraduate students, Sam Forster and Katie Auchettl. A recent recruit to this group is Dr Sarah Boyd, an experienced bioinformatician who has a joint appointment in the IT faculty at Monash University.

The first bioinformatics database (INTERFEROME) will be used to help identify proteins that help fight infection and

cancer that are controlled by interferons. There are more than 2,000 interferon regulated genes that are involved in innate immunity; this system will assist the researchers to determine which specific genes are involved in different protective functions.

The other bioinformatics database (TOLLOME) is a model of the innate immune system and will help scientists understand the system as a whole. Currently researchers are only able to look at one gene at a time, the new system developed by CIID will allow them to analyse hundreds of genes concurrently.

The two databases will have a great impact on the research conducted in CIID and also have the potential to help researchers across the world to further their understanding of the innate immunity system.

We congratulate Dr Samarajiwa who has recently been recruited to the prestigious Cambridge Research Institute of the Cancer Research UK to continue his research in bioinformatics.

Molecular Regulation of Immunity Lab

The Molecular Regulation of Immunity Lab, headed by Professor Paul Hertzog, focuses on understanding the body's molecular response to viral and bacterial infection, inflammation and cancer using multidisciplinary approach including functional genomics and mouse models.

The interferon (IFN) family of cytokines are key regulators of immunity and is central to these processes. IFNs are a multi-gene family whose roles and function remain unclear. They are produced in response to pathogen recognition by toll-like receptors (TLRs) and other

receptors of 'danger' signals activated by infection or other cell death signals. The Ets family of transcription factors are key regulators of inflammatory responses. Scientists in this team are interested in the cytokine environment in which IFNs and other factors operate.

The paradox with interferons is that they are used to treat some diseases such as hepatitis B and C, certain leukemias and multiple sclerosis; yet in other situations they contribute to diseases on inflammatory origin like systemic lupus erythematosus and sepsis. So

in order to improve the efficacy and safety of administering or blocking interferons, we need to understand their mechanism of action at the level of sophisticated molecular biology.

Harold Mitchell Travel Awards



Priscilia Cassalinga and Dr Tu'uhevaha Kaitu'u-Lino

Dr Tu'uhevaha Kaitu'u-Lino from the Centre for Women's Health Research and Ritchie Centre PhD student, Priscila Cassalinga, are the 2008 recipients of the Harold Mitchell Travel Fellowships. Both scientists will receive \$5,000 towards travelling to a major overseas conference and visit international laboratories.

Postdoctoral Travel Fellowship winner, Dr Tu'uhevaha Kaitu'u-Lino works with Dr Caroline Gargett in the Endometrial Stem Cell Laboratory. Her current research focuses on combining a mouse model of menstrual breakdown and repair. This will increase understanding of how adult stem cells function in regenerating the endometrium, and will also provide novel insights into the failure of adequate endometrial repair in abnormal uterine bleeding; a condition that affects around four million Australian women.

"I'm extremely grateful that the Harold Mitchell Fellowship gives me the opportunity to attend the prestigious International Society for Stem Cell Research Annual Meeting in Barcelona, Spain in July 2009. While I'm in Spain, I'll also meet with one of our collaborators, Professor Carlos Simon, who heads the visit the Valencia Stem Cell Bank at the Prince Felipe Research Centre," Dr Kaitu'u-Lino said.

Priscila Cassalinga, recipient of the Postgraduate Travel Award, will submit her PhD thesis, *Sympathetic nervous system control of the cerebral circulation in sleep*, before the end of the year. Her research has provided evidence that the sympathetic nervous system plays a protective role in cerebral circulations, and may have implications in the onset of stroke. She is the first person to make specific recordings of the very small sympathetic neurons in the brain, which has provided a unique insight into the control of cerebral circulation.

"The Harold Mitchell Postgraduate Award means I can now visit the Department of Physiology and Pharmacology and the Department of Obstetrics at the Oregon Health Sciences University in Portland, USA, and the Mayo Clinic in Iowa. The scientists I'll meet with have been at the forefront of cardiovascular research for the last 20 years. Without the support of the Harold Mitchell Award I wouldn't be able to make these visits," Priscila said.

Grant Creates PhD Scholarships

Training the next generation of scientists in prostate cancer research is imperative to the realisation of new therapies and treatments, which may lead to a cure for this disease. Mr and Mrs George and Janet Limb recognise the importance of fostering the talents of young researchers in this area.

To support young researchers in MIMR's Centre for Urological Research, the Limb Family Foundation have provided two PhD scholarships.

George and Janet Limb recently visited MIMR to meet with Centre Director, Professor Gail Risbridger and the two students, Shirin Hussain and Sarah Wilkinson, who have been awarded the scholarships and began their PhD studies this year.

Sheri's PhD will be spent investigating possible therapies for prostate disease. Her research project is specifically aimed at testing these treatments in animal models and human cell lines. Whilst this research is in a comparatively early stage, it is hoped that the overall outcomes of this research will result in a lasting treatment for prostate diseases.

Sarah is researching basic stem cell biology to investigate how and why things go wrong with stem cells in the prostate. Her aim is to further understanding of stem cells in the prostate and mammary glands, and their impact on development of prostate diseases.

In recognition of the support given to student education at MIMR, Mr Limb was made a



(L-R) George and Janet Limb, Sarah Wilkinson, Gail Risbridger and Sheri Hussain

member of the MIMR Patron's Club. The Patron's Club brings together like minded people

who all have an interest in advancing and supporting the research conducted at MIMR.

UROP Presentation Day Showcases Students Talents

Several MIMR students made presentations at the recent Undergraduate Research Opportunities Program Presentation Day held on 10 July at the University of Melbourne.

The Undergraduate Research Opportunities Program (UROP) gives students a chance to conduct research in a laboratory to gain experience in the field of biomedical research.

The Presentation Day is a one-day conference at which

both current and past students present their work. A plenary lecture was presented by the Nobel prize winner, Professor Peter Doherty, on a career in Science. The day also provided students an opportunity to interact with other UROP students and supervisors from other universities and institutes.

Centre for Innate Immunity and Infectious Diseases (CIID) Senior Scientist, Dr Brendan Jenkins, was the chair of one of the sessions at the Presentation Day.

MIMR students presenting their work were:

- Julian Kirsch, Ritchie Centre – "Blood Pressure Waveforms in Infants"
- Michelle Meilak, CIID – "The Impact of Cytokine Signalling on Toll-like Receptor Mediated Immune Responses – Stomach Cancer"
- Katie Auchetti, CIID – "Bioinformatics of innate immune genes and pathways: annotation of novel interferon regulated genes"

Coordinator of the UROP program at MIMR, Dr Elspeth Gold, said that the Presentation Day provides students with an opportunity to extend their presentation skills and profile their research.

"It is a critical part of the UROP students' learning about life as a scientist" said Dr Gold.

Gifts in Memory of a Loved One

When someone special passes away, a memorial donation to MIMR is a meaningful alternative to sending flowers.

Gifts in memory are a thoughtful way to remember someone and give family and friends the opportunity to support medical research which will help ensure the health and wellbeing of future generations.

If you wish to support the Institute in this way, please ask your Funeral Director for our Memorial Envelopes or contact the Institute on (03) 9594 7133. Gifts to MIMR are tax deductible. We can also provide information packs about the Institute for family and friends.



Indonesian Collaboration Goes from Strength to Strength

The collaboration between MIMR and Gadjah Mada University (GMU) that was formally ratified in May 2007, has continued to expand with a recent visit from Gadjah Mada's 2008 Dean Professor Dr Hardyanto Soebono and three of their senior scientists, Professor Sofia Mubarika, Dr Ishandono and Dr Triwibawa.



Professor Bryan Williams with the delegation from Gadjah Mada University

The focus of the visit was the further development of education modules on molecular medicine to be used in staff development programs at GMU. This education is targeted at specialist clinicians who work in the faculty of medicine at GMU, providing them with research training to complement their clinical training.

MIMR Education Program in Reproduction and Development staff, Associate Professor Peter Temple Smith and Drs Mulyoto Pangestu and Sally Catt, have assisted the GMU representatives to enhance their knowledge of infertility management.

Later this year, eight infertility specialists will visit MIMR to participate in a four-week training program which includes a series of workshops, lectures, seminars and practical demonstrations that will provide the necessary skills and knowledge for infertility management.

The mutually beneficial relationship MIMR has with GMU holds many opportunities for future research collaborations to explore infertility management as well as stem cell research.



Helen Macpherson Smith Trust Grants Executive Visit

The Helen Macpherson Smith Trust has provided generous support to MIMR since the Institute's inception in 1991

The trust has recently appointed a new Grants Executive, Mr Chris Wootton, who recently visited MIMR.

Mr Wootton met with Institute Director, Professor Bryan Williams, who expressed his gratitude for the past support, outlined the breadth of research that is currently conducted at the Institute and his vision for the future.

We look forward to working closely with Mr Wootton and the Helen Macpherson Smith Trust in the future.

Join us at the 2008 Ron Evans Golf Day

The second annual Ron Evans Golf Day will be held on Monday 24 November. Golfers have the opportunity to play at the exclusive Royal Melbourne Golf Club and support cancer research at MIMR.

Teams of four players are invited to register at a cost of \$5,000 per team. Registration includes a light lunch before teeing off and attendance at the Ron Evans Golf Day Dinner at the conclusion of the game.

If you would like to register a team or for more information, please call the Development Office on 03 9594 7113.



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